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Colombia Labor Market Adjustment, Reform and Productivity

What are the Factors that Matter?

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ABBREVIATIONS AND ACRONYMS

AC	Apprenticeship Contract
CCFs	<i>Cajas de Compensación Familiar</i>
CONPES	<i>Consejo Nacional de Política Económica y Social</i>
DANE	National Administrative Department of Statistics
DID	Differences in Differences Estimator
DNP	<i>Departamento Nacional de Planeación</i>
ECH	<i>Encuesta Continua de Hogares</i>
ED	Employment Duration
ENH	<i>Encuesta Nacional de Hogares</i>
ER	Employment Rate
FDI	Foreign Direct Investment
FS	Formal Salaried workers
HEG	Hard-to-employ Groups
ICBF	<i>Instituto Colombiano de Bienestar Familiar</i>
IDB	Inter-American Development Bank
ILO	International Labor Organization
IMD	Institute for Management Development
IMF	International Monetary Fund
IS	Informal Salaried worker
ISIC	Industrial International Classification
LAC	Latin America and the Caribbean
MPS	Ministry of Social Protection
NHS	National Household Survey
OLS	Ordinary Least Squares
PADE	<i>Programa de Apoyo al Desempleo</i>
SE	Self-employment r
SENA	<i>Servicio Nacional de Aprendizaje</i>
SISBEN	<i>Sistema de Selección de beneficiarios</i>
TFP	Total Factor Productivity
TGP	<i>Tasa Global de participación</i>
UAR	Unemployment rate of prime age males
UD	Unemployment Duration
UIH	Underemployment because of Insufficient Hours
UI	Unemployment Insurance
UR	Unemployment Rate
WEF	World Economic Forum

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LABOR MARKET ADJUSTMENT, REFORM AND PRODUCTIVITY IN COLOMBIA: WHAT ARE THE FACTORS THAT MATTER?

1. INTRODUCTION

The Colombian economy was substantially transformed in the period 1985-2004. Indeed, after several years of a stable economic environment, characterized by isolation from world markets and moderate State intervention in the economy, the country engaged in a series of structural reforms from 1989, but especially in the periods 1990-94 and 2000-2004. These reforms included (i) opening goods and services markets to international competition, with a more open code for foreign investment; (ii) capital market liberalization; (iii) two labor reforms (1990 and 2002) to flexibilize a market generally recognized as overly regulated; (iv) a profound reform to the social security system (health and pensions), introducing competition into both services and increasing payroll contributions; (iv) the opening of many sectors to private and international competition, notably public utilities, which switched the role of the public sector to a more regulatory one; (v) a steady increase in the tax burden paid by the society (from 9 to 13.5% of GDP); (vi) a much larger growth of public spending from 1991 (compared to taxes) mainly driven by legal and constitutional mandates (see next point); and (vii) a new Constitution that implied novel institutions, decentralization of the provision of key social services and an independent Central Bank (see Annex 1 for an account of the reforms).

The consequences of this new framework were many. On the fiscal front, large expenditure obligations were superimposed on the existing public spending structure, mainly due to regulations related to social services and the increase of transfers to sub-national governments, both mandated by the new Constitution. On the production side, important industrial and occupational restructuring of employment took place, at the same time that productive processes evolved to fit the new realities. On the macro side, since the Central Bank's new mandate was to reduce inflation and manage the exchange rate policy, the external shocks of the 1990s (Russian, Asian and Tequila) could not be accommodated through channels used in the 1970s and 80s (e.g. expansionary monetary policy), and were thus partially transmitted to the real sector. There is evidence (Echeverry, Escobar and Santamaría, 2002) that the business cycle shortened but fluctuations became larger after the reforms (the economy became more volatile). On the "social" side municipalities and departments (the Colombian states) began to deliver the most important services (education, health, sanitation), relying mainly on increasing transfers from the central government.

These reforms sought to increase growth by providing an environment amenable to private investment and innovation, by forcing an efficient allocation of resources and by facilitating human capital accumulation. This goal seemed to have been fulfilled since the growth rate reached levels of roughly 5% during 1992-95 (the average was 5.1%). However, within the more volatile environment, the economy confronted a public and private consumption boom, an increase in foreign investment inflows and, most importantly, public spending grew from 1991, but especially from 1995 to 1998. Fiscal imbalances appeared since expenditures grew faster than revenues. The central

government deficit went up to 7.6% of GDP in 1998¹, private investment fell sharply and the financial sector became fragile. This situation, combined with increasing levels of violence, caused risk indicators to deteriorate. Consequently, in 1999 Colombia faced the most severe recession since the 1930s. In fact, the entire period 1996-2002 was one of low growth, 1996 marking the beginning of the recession. Growth was negative in two quarters, barely reaching 2% at the end of the year. In 1997 the expansionist policies followed by the Central Bank allowed the growth rate to pick up (3.4%). Subsequently, pressure from the fiscal accounts, international events, misalignment of key prices and the increased severity of the armed conflict made the growth rate plummet to 0.6% in 1998 and -4.3% in 1999 (the first year of negative growth since 1930). Growth became positive again in 2000-02, but remained low (2.9, 1.4 and 1.6%). Hence, during those seven years growth averaged only 1% per annum. In 2003 and 2004 growth regained momentum, reaching almost 4% in both years.

These developments (structural reforms and a more pronounced cycle, including an important recession) are bound to have dramatically altered the functioning of the labor market in ways that are not yet fully understood. The effects are both direct (through labor reforms) and indirect (e.g. changes in the industrial or occupational composition of the economy that affect the level and composition of employment and wages). Understanding these effects is instrumental in the design of effective policy interventions for at least two reasons. First, the functioning of the labor market is a key determinant of the possibilities of sustained growth for the country. In short, if the functioning of the labor market is not compatible with technological progress, the prospects for long run productivity and thus economic growth are undermined. Second, in the short run, the nature of the adjustment observed in the labor market will determine the extent to which unemployment rises during recessions, and how fast it recovers during expansions, with obvious and important impacts on welfare. Thus, the main objective of this Report is precisely to provide evidence that helps in (i) the understanding of the “structural changes” that occurred in the Colombian labor market; and (ii) the evaluation of recent labor market interventions in order to be able to propose different policy alternatives to improve the market’s ability to provide more decent jobs for the Colombian population. To complete the picture, the report will also try to shed some light on the issue of productivity growth (evolution and determinants) that allows the establishment of a link between labor market outcomes and economic performance and to draw useful policy alternatives in this area as well.

More specifically, it seems clear that many of the issues related to the Colombian labor market are dependent on the reforms undertaken in the 1990s and on labor institutions (regulations, labor costs and minimum wages). A slow and unbalanced pace of educational accumulation has also been identified as an important constraint for improved performance of the labor market and for higher productivity growth. This report, however, will focus on the first two, giving attention, of course, to educational issues when warranted (that is, mainly when skills are particularly important determinants of some outcome being studied). Thus, the objectives stated above seek, in the end, to

¹ Reduced revenues due to the declining level of economic activity, even in the presence of several tax reforms, also contributed to the worsening of the fiscal position of the country.

inform the debate in Colombia and, to a lesser extent, to help in the design of useful policy actions that might be taken with two main goals in mind. First, to encourage formal employment creation, and second, to provide alternatives for the design of effective social protection and insurance systems that provide the population with better services and interfere less with the functioning of the labor market. These policy alternatives will focus on labor legislation, incentives for formality, other labor market “institutions” such as minimum wages and non wage costs. Also, the report will comment on some general aspects important to improving productivity growth. This constitutes an additional step in the long term effort initiated by the government to improve the functioning of the labor market and provide more efficient social protection services.

This report, conducted jointly by researchers in various countries, the Government and the World Bank, aims to address these questions not by focusing on labor market functioning, but on its outcomes. After all, the really important questions are not whether the labor market is overly informal or excessively rigid. What is central are labor market outcomes, such as adequate employment growth so that people can find gainful employment, acceptable worker productivity levels that are fairly compensated, and reasonable protection against shocks for workers and their families. This shift in focus, however, complicates the work. While one can study labor market functioning without paying too much attention to non-labor factors (e.g. payroll taxes), such approach is impossible when the subject of study is outcomes. Employment growth depends on macroeconomic factors at least as much as on labor regulations; productivity levels depend as much on investments in physical and human capital, as they do on labor market interventions; and protection against shocks depends as much on factors such as safety nets as it does on labor regulations. But this added complexity is necessary for a better understanding of the labor market. To simplify matters, the focus is on the most relevant relationships, between labor market institutions, its functioning, and outcomes. The report is structured accordingly.

The report will focus on four broad topics, in line with the goals stated above (i) main transformations in the labor market during the last 15-20 years, related to the variables of interest, such as unemployment, employment, hours, participation, wages, occupation, sectoral composition of employment and informality, among the most important. The analyses will focus on urban labor markets; (ii) adjustment of the labor market to the business cycle, emphasizing the factors that have constrained a more efficient adjustment; (iii) effects of labor market regulations on employment and productivity; and (iv) productivity growth (estimation and determinants).

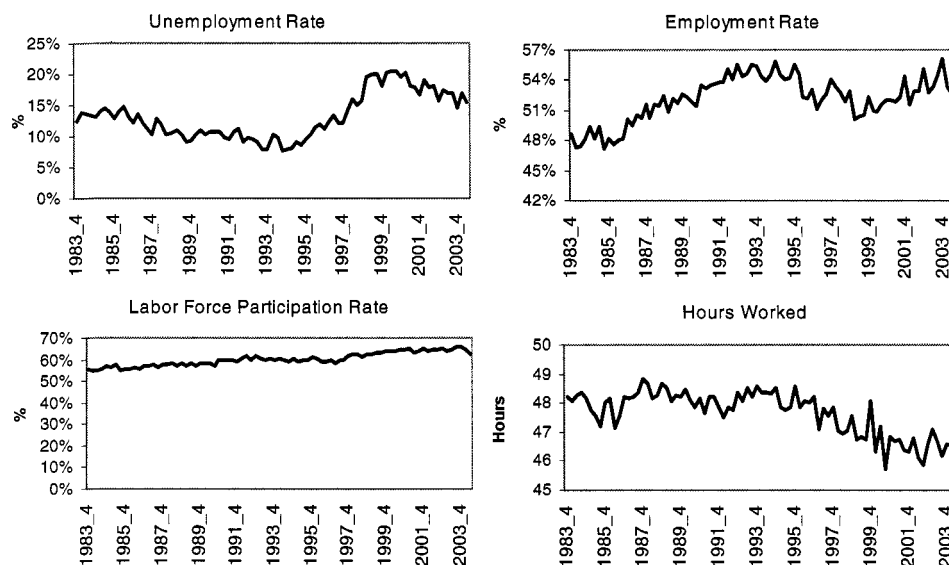
2. DESCRIPTION OF THE MAIN CHANGES SINCE THE 1980S²

SUMMARY

This chapter studies the main changes of the key labor market outcomes occurred in the last 20-odd years. The main messages can be concisely stated as follows: (i) the Colombian urban labor market seems to have “stabilized” at a higher level of unemployment and labor participation has increased markedly. Hours worked declined in the last ten years; (ii) the labor market is increasingly female and commerce and service oriented. While in 1984 four out of ten women were in the labor force, today this figure is six; (iii) in terms of occupations, the composition of the urban labor market became more self-employed oriented; (iv) wages, which are related to productivity, show sluggish growth if the entire period is analyzed. Indeed, they increased by some 9% between 1984 and 2004 (i.e. less than 0.5% per year). However, wage growth was impressive during the expansive period 1991-98, which also coincided with a period of high productivity growth; and (v) all outcomes tend to be worse for the least and intermediate skilled, especially the latter, when compared to the rest of workers.

There are important changes in almost all variables that are considered “key” in traditional labor market analyses: unemployment, employment, wages, sectoral and occupational distributions of the labor force, participation rates, gender shares in total employment and hours worked. Figure 2.1 below shows the evolution of employment unemployment and participation rates, plus hours worked, where the most important changes can be easily identified.

Figures 2.1: Employment, Unemployment, Participation and Hours Worked, 1983-2004



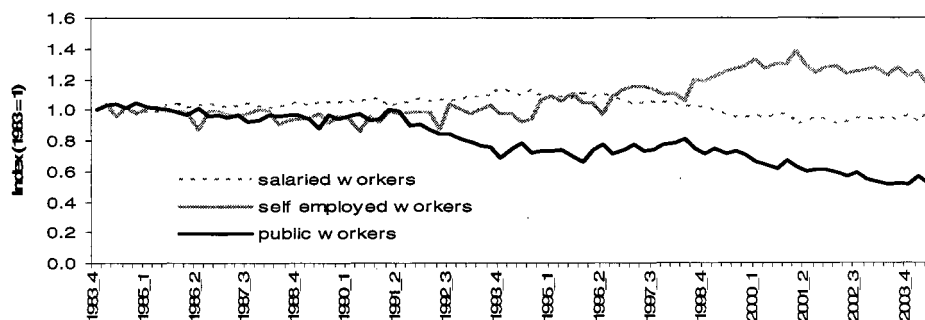
Source: ENH- DANE

² The analyses here are carried out with data for what will be called from now on “Urban Colombia” (seven cities included in all the surveys): Barranquilla, Bucaramanga, Bogotá, Manizales, Medellín, Cali and Pasto. They account for 50% of the urban population and are very heterogeneous.

It is immediately apparent from the figures that (i) the unemployment rate (UR) seems to have reached a higher “equilibrium” level in the later years, when compared to the initial years in the period. In particular, by 1996 this variable began to grow and, despite renewed economic growth after 2002, it has not gone down to levels close to those observed in the late 1980s and early 1990s; (ii) participation (TGP) and employment (ER) rates (especially the former) have grown consistently over the period. Indeed, the participation rate increased from less than 55% to 65%, while the corresponding figures for the employment rate were 48 and 56% (note that the employment rate decreased during the recession years but picked up later). It will be shown later that the evolution of the TGP (and consequently that of the UR and ER) was greatly influenced by the behavior of women; (iii) the average number of hours worked began to fall in 1996 and, despite some recovery since 2001, it has remained at a lower level than in previous years. Thus, from this information it can be argued that, in general, people seem to be having more trouble finding a job in the last eight years, at the same time that they are working fewer hours and that there have been huge increases in labor market participation.

Other variables display remarkable changes as well, as is shown in what follows. In particular, the share of employment in manufacturing declined from 25% to less than 20% of all employment during the period. At the same time, sectors such as commerce (wholesale and retail) and services increased their share from 23 to 30% and from 30 to almost 34%, respectively. The remaining sectors have maintained a fairly constant share throughout the period, with the exception of the financial services sector, which reduced its share by almost a half (although it never had more than 8% of the total urban labor force). Figure 2.2, on the other hand, portrays the evolution of employment according to the occupation of the individual, showing important developments as well.

Figure 2.2: Shares of Employment by Occupation (Indices), 1980-2004



Source: ENH- DANE, Author calculations

It is apparent from the graph that the share of the self-employed has grown in a very important fashion. In fact, it increased by a factor of 1.2, reaching a peak around 2001 when the accumulated growth was over 40%. The other side of the coin is given by the share of the other two occupations. Private salaried employment declined by approximately 10%, with the decline starting around 1995/6. It is important to note, thus, that both the increase in self-employment and the decrease in private salaried employment began to appear forcefully around the same period, mid 1990s and then again in 1999, dates that broadly coincide with two other events: the introduction of the

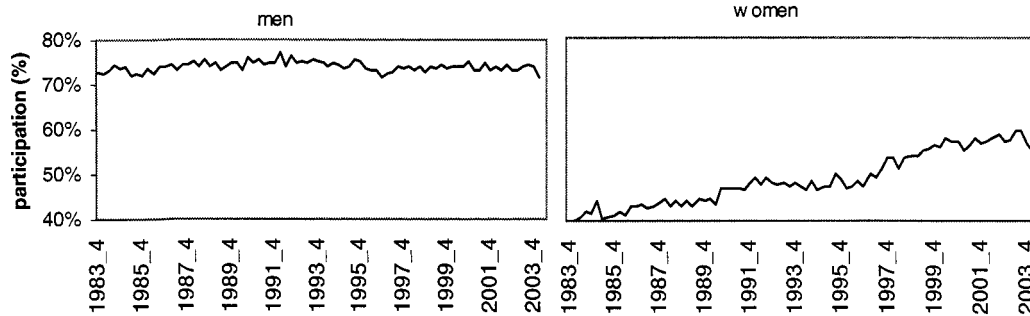
reform of the social security system (Ley 100 de 1993) and the lowest point of the recession. Public employment, on the other hand, also lost share in total employment, although more markedly (around 40%). Also, there was a steady decline since 1991, responding to public policies directed at reducing the share of public employment. These three occupations accounted for 85% of urban employment in 2003.

The composition of the employed population in terms of age and educational attainment also changed during the period. In particular, the working population became older and more educated. Indeed, if in 1980 the proportion that had completed only primary school or less reached almost 50%, this number had declined to 26% in 2003. Similarly, the share of workers with an intermediate (high school and incomplete college) or high education (completed university) increased importantly, especially the latter, as their shares went from 39 and 13 to 44 and 29%, respectively. In terms of unemployment rates by education, all levels display behavior very similar to the general unemployment rate (i.e. a trend towards lower unemployment until 1995, to then grow drastically in the period 1996-2002 and appear to stabilize at a high level), but the highest rates were always observed among the intermediate group, while the lowest rates belong to the most educated. Interestingly, during the last year the lowest unemployment was observed in the least skilled group. Participation rates at the end of the period (2003), on the other hand, were highest among the most educated and lowest in the least educated group, while at the beginning of the period the ones who participated the least were those with an intermediate education. This shift is surely related to the increasing share of intermediately educated people in the general population. In terms of the age distribution, the group of young workers (below 25 years of age) lost participation, while older groups of workers (over 40 years) all increased their share during the period.

However, one of the most important changes that occurred in this period was the increased participation of women in the labor market (beginning in the 1970s), which is bound to have altered many of the key labor market outcomes in important ways. Some of these are explored in what follows. Figure 2.3 documents very well this shift towards a more “female” labor force. Indeed, it shows that practically nothing happened to male participation rates over the period (they stayed at around 72%), while female participation rates grew consistently and at a very high pace (this trend and its determinants will be discussed in detail in the next section). In effect, in 1984 about 44% of women participated in the labor market and this number had grown to almost 60% in 2004. That is, female participation grew at a rate close to 0.6% average per year. Note in the figure that the growth of female participation was especially high in the period 1996-2001, coinciding with the recession. This may imply, as shown in the literature (see, for example López, 2001 or Rojas and Santamaría, 2001) that many women began to participate in the labor market as a response to declining household incomes. It is still early to gauge if this was a permanent or a transitory shock. As a result of the increase in female participation rates, the proportion of women in the active population grew from 38 to 49%. This development has also been reflected in an increasing employment rate for women (from 32 to 46%), while that of men followed a very similar pattern to the general one (Figure 2.4) and seems to have stabilized at a lower level since 1999 (around 62%, down from 70% in the mid 1990s). In fact, in Figure 2.4 it is clear that the decline of the

employment rate during the recessive period was more marked for men than for the entire population, while women's employment rate fell only slightly in those years. Thus, at first sight it would seem that the labor market has been able to provide jobs to partially accommodate the ever increasing number of women entering the labor force, maybe at the expense of men.

Figures 2.3: Participation Rates by Gender, 1983-2004



Source: ENH-DANE

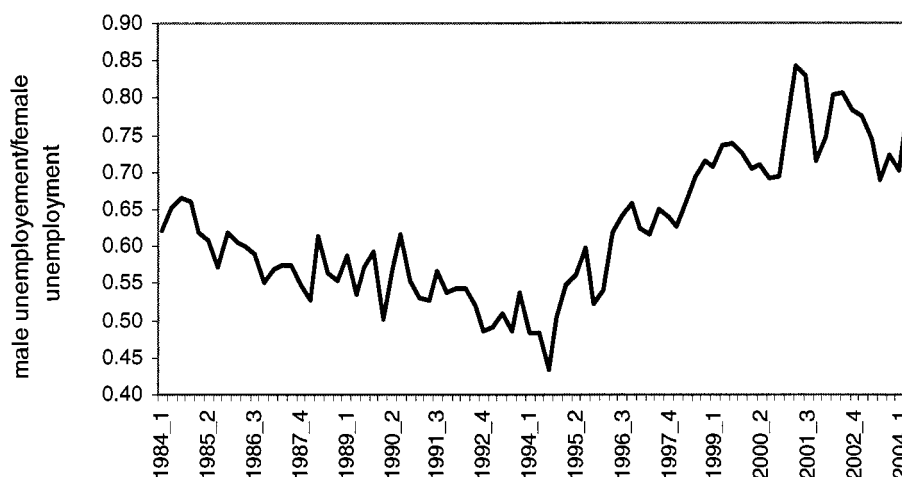
Figures 2.4: Employment Rates by Gender, 1983-2004



Source: ENH-DANE

Figure 2.5, on the other hand, shows the ratio of the male unemployment rate to the female one. It seems that the pressure coming from the consistent increase in female participation has not been completely accommodated by generation of new jobs and men have been especially hurt. In effect, this ratio fell from 0.6 to 0.45 between 1984 and 1995, point at which it began to increase continuously until 2004, when it reached 0.8. Of course, this increasing gap between male and female unemployment may not be, at this point, attributable to the growth of female participation. However, the marked trends and similar timing of the events seem to point in that direction.

Figure 2.5: Male-Female Unemployment Ratio, 1984-2004



Source: ENH- DANE, Author's calculations

Two other key variables also show diverging behaviors over the period, especially since the recession started. First, Figure 2.6 displays the evolution of the average number of weekly hours worked by gender. It is striking to notice the different evolution of both series. In particular, while men have kept their usual shift practically unchanged (or even increased it slightly at the end of the period), women experienced a sharp decline in theirs starting around 1995 and becoming steeper in the recession. Indeed, men worked around 50 hours the entire period, while women went from working 46 hours at the beginning to only 42 at the end of the period.

Figures 2.6: Weekly Hours of Work by Gender, 1984-2004

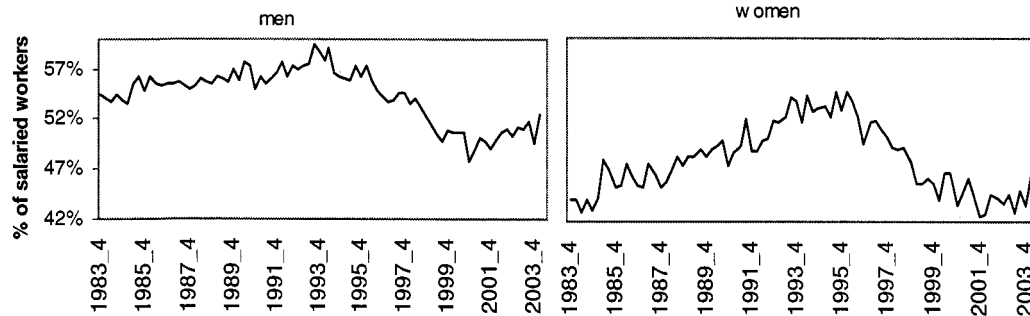


Source: ENH-DANE

Second, Figure 2.7 portrays the evolution of salaried employment to assess how the occupational choice by gender has evolved. The story in this case appears to be somewhat different. In effect, the evolution of both series is not as dissimilar, especially after 1995 when it declined drastically for both genders. This decline lasted until 2002 and totaled 15% for men (nine percentage points) and 21% for women (12 percentage points). From then and until 2004, the share of salaried employment has been stable in both cases around 50% for men and 43% for women. In the period previous to 1995, the proportion of salaried employment grew 10 percentage points among women (from 45 to

55%), while it remained practically unchanged for men. Thus, it appears that the same shock affected both genders in 1995 making the proportion of salaried employment decrease. It will be argued in later sections that it is very closely related to the increase in non-wage costs brought about by the introduction of Ley 100, the recession and to a lesser extent to the increase of minimum wages during the second part of the 1990s.

Figures 2.7: Proportion of Private Salaried Employment by Gender, 1983-2004



Source: ENH-DANE

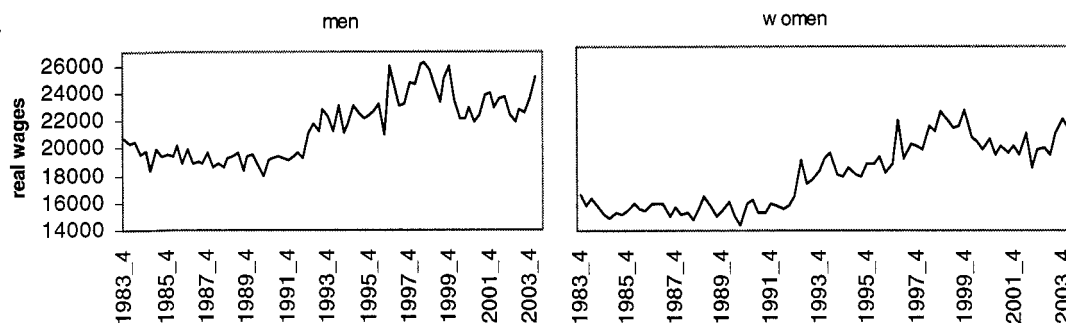
This brief account of the main changes occurring in the last 20 years is completed with a short discussion on wages. Figures 2.8, 2.9 and 2.10 show the evolution of real wages for the whole sample, private salaried workers and self-employed, respectively (all of them split between men and women). Three points are worth highlighting from these graphs: (i) in general, both men and women's wages followed a similar evolution: almost no change until 1993, impressive growth during most of the 1990s, and sharp decline during the recession and a timid recuperation starting in 2001/2. Women's wages grew more than men's during the expansive period (40 vs. 30%) and the decline during the recession was similar for both genders (around 20%); (ii) the evolution of the private salaried workers' wages is similar to the one for the whole sample, but noting that the increase during the expansion is more marked and the fall during the recession is not as important, reflecting more inflexibility of wages in this occupation. For example, among men the increase reached an amazing 50% while the fall was of 12%; and (iii) real wages of the self-employed fell continuously since 1996 and until 2002, reflecting the ability of this occupation to adjust to changing economic conditions. That is, real wages fell all along the period of low growth and only stabilized after 2002, although they did not grow.

Figures 2.8: Real Wages by Gender, 1983-2004



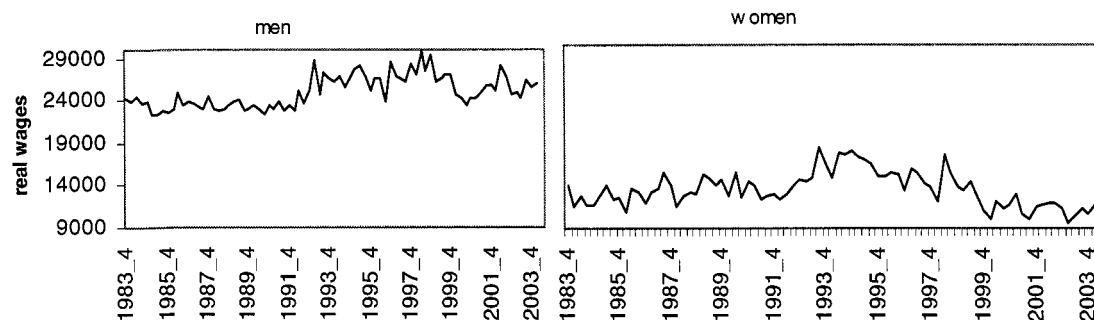
Source: ENH - DANE

Figures 2.9: Real Wages of Private Salaried Workers by Gender, 1983-2004



Source: ENH - DANE

Figures 2.10: Real Wages of the Self-Employed by Gender, 1983-2004

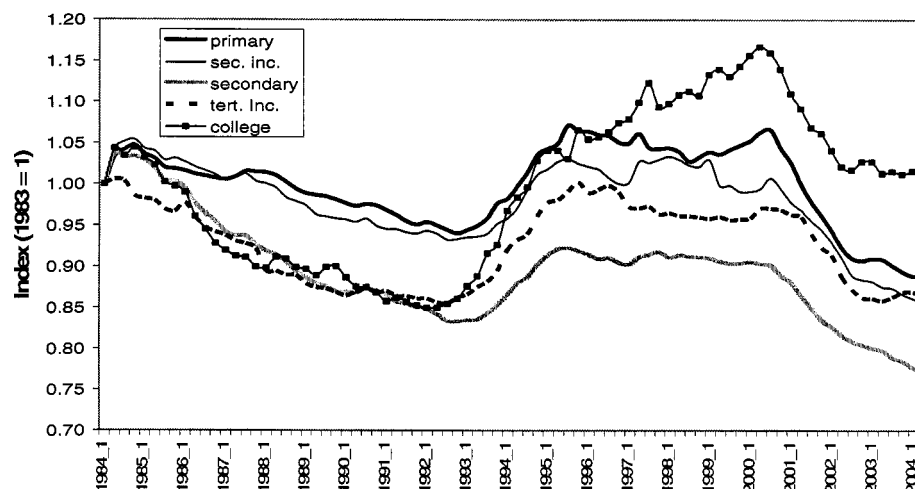


Source: ENH - DANE

Finally, wage inequality across education groups has also changed substantially over the period. Figure 2.10a shows the evolution of real wage indices of private salaried workers by education level (8-quarter moving average). It is apparent that (i) the gap between the groups of most educated workers and the rest increased. In fact, wages of the most educated were the only ones that increased in real terms during the period (by a mere 3%). All the other groups experienced real falls in their wages; (ii) the largest falls are observed among the intermediately skilled groups, especially that of completed secondary education, for which wages fell by about 23%; and (iii) there are three clearly differentiated periods: in the first (1984-1992) wages for all groups fell, particularly those of high-school workers and both groups of college workers, i.e. the most skilled. In the second (1992-2001) the wages of all groups increased, but especially for the college group by an impressive 100%. In fact, for the rest of the groups the period 1997-2001 is one of practically no change in wages. Note that there is an important wage decline in 1998-2000 for no group, the worst years of the recession. The increase during this period is smallest for those with a high school education (about 11%). In the latest period (2001-2004) wages fall for all groups by about the same proportion (at least until 2003). This behavior of wages is basically dictated by three events: first, the increase of wages of the most skilled and the decline of the intermediate group is strongly related to a process of technical change that increased demand for high skilled workers, coupled with an impressive increase of the relative supply of intermediate education (see Santamaría, 2004 for a detailed account of these events). Second, the business cycle was expansive in

the first half of the 1990s and recessive in later years, with a recovery after 2002. The final determinant is the rigidity of wages, which implied that they grew much more during expansion than the decline in the recession (which actually was post-recession).

Figures 2.10a: Real Wages of the Private Salaried Workers by Education, 1983-2004



Source: ENH- DANE, Author's Calculations

- Recent Evolution of the Main Outcomes

In what follows, a very brief description of the recent evolution (2001-2004) of the main labor market indicators will be carried out for the main thirteen cities of the country. This exercise will prove very useful to understand many of the remaining sections of the report, especially the one concerned with the evaluation of the 2002 labor reform. Figure 2.11 shows the evolution of the number of employed people, along with the employment rate during this period.

Figure 2.11: Employment in Urban Colombia, 2001-2004

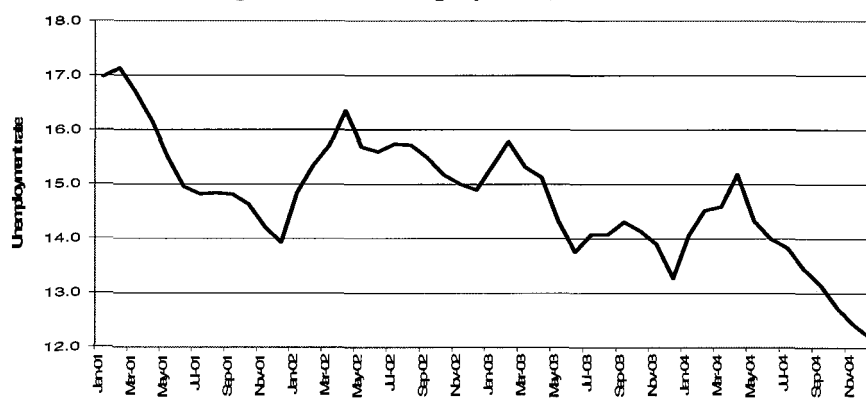


Source: ENH - DANE

It is apparent from the figure that employment grew consistently over the period, at a higher pace since mid 2002, but especially in 2003. During this period (July 2002-December 2003) employment generation amounted to some 1.5 million jobs. This can be confirmed by looking at both series, which is important because it indicates that employment generation grew faster than the participation rate. It suffices to note that employment grew about 5.2% in 2003, while GDP did so by 4%. In 2004, however, the pace of employment generation was undoubtedly reduced, although still with a positive trend. However, comparing the employment level of December 2003 with the same month in 2004 gives a loss of about 400,000 jobs. Thus, since mid 2002 about 1.1 million jobs have been created. Also, it is important to note that during 2004 both series behaved somewhat differently (they seem to drift apart), indicating that the growth of the participation rate, which affects the employment rate, changed in that year. This last assertion is confirmed by the fact that the participation rate declined in 2004 from 62.5 to slightly less than 60%.

The other side of the coin, of course, is the behavior of the unemployment rate, which declined, although not impressively, throughout the period. For example, comparing December 2002 with December 2004, the unemployment rate went down from 13.5 to 12.1%. If January, usually the highest unemployment month of the year, is used instead, the decline is lower. In January 2001 the unemployment rate was 17%, it went up in 2002 and 2003 to levels close to 18% to go back again to just under 17% in 2004. Figure 2.12, below, shows the behavior of this variable (4-month moving averages), indicating a downward trend, although not particularly marked.

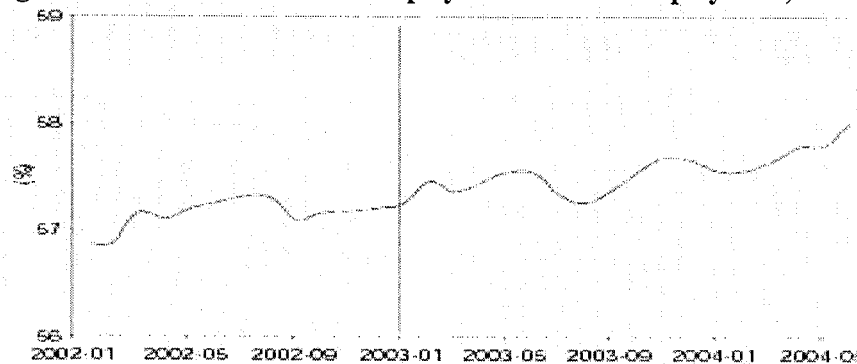
Figure 2.12: Unemployment, 2001-2004



Source: ECH – DANE- Author's Calculations

However, what is most important from the graph is the fact that unemployment seems to have declined faster in 2004 than in 2003, despite the fact that the pace of employment generation was higher in 2003 than in 2004. Thus, the story appears to be one in which employment grew importantly in 2003, but participation did the same and, therefore, unemployment did not decline as much. In 2004, on the other hand, the situation was the opposite: employment generation lost momentum but participation declined, especially in the second half, causing unemployment to decline at a faster rate. The evolution of salaried employment is discussed next (Figure 2.13).

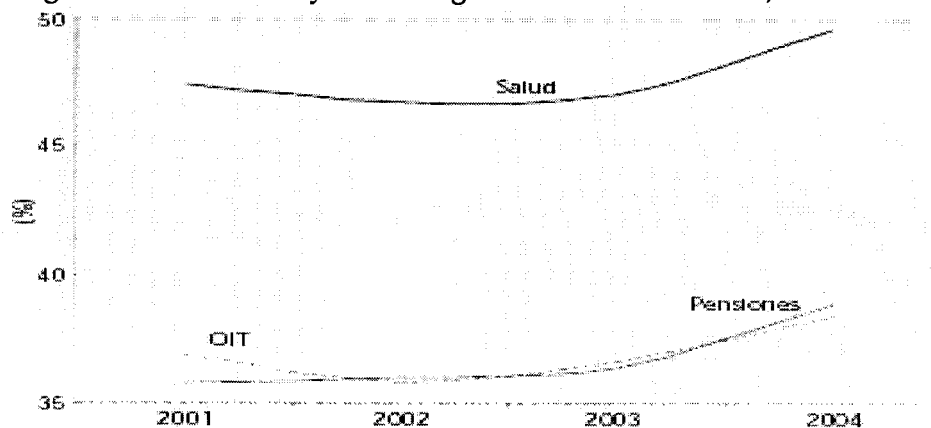
Figure 2.13: Share of Salaried Employment in Total Employment, 2002-2004



Source: Gaviria (2005)

The figure shows clearly that the share of salaried employment grew over the last two years. In particular, it increased by slightly more than one percentage point to reach 58% in 2004. Also, it is important to note that this increase is more marked since mid 2003. This is consistent with the evolution of informality, shown in Figure 2.14.

Figure 2.14: Informality According to Various Definitions, 2001-2004



Source: Gaviria (2005)

The figure shows that informality, measured according to three widely used definitions, decreased in the period 2003-2004. Indeed, registration of workers to health and pensions increased, and the same behavior is observed using the formality definition used by ILO, which relies heavily on the size of the firm and the type of contract held by the worker³.

Thus, it can be concluded that over the last four years (i) occupation rates grew importantly, but the pace declined in 2004; (ii) participation decreased in 2004; (iii) as a result, unemployment fell continuously since 2001, but more markedly in 2003-2004; and (iv) salaried employment increased, at the same time that informality fell, especially in the period 2003-2004.

³ The ENH measures these variables only in the second quarter of each year since 2001 (before it was every two years) and thus the graphs only contain four observations.

3. ADJUSTMENT DURING THE RECESSION AND IN THE FOLLOWING YEARS: HAS IT WORKED?⁴

SUMMARY

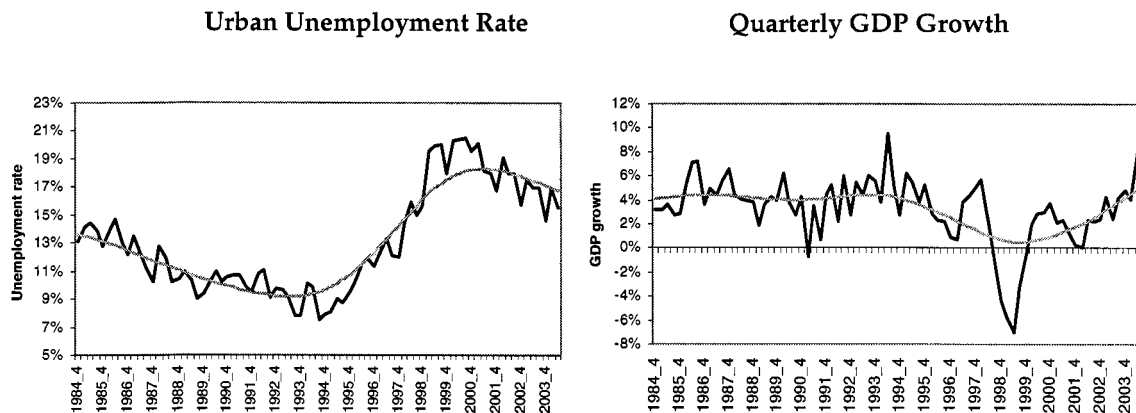
This chapter addresses the key determinants of the shifts in the outcomes detailed in the previous chapter. The main messages may be summarized as follows: (i) increasing participation rates, especially female and young, have had an important impact on unemployment, particularly during the recession. Participation, in turn, has been driven by structural changes and by fluctuations of GDP; (ii) minimum wages and non-wage costs appeared as key determinants and their effect became particularly pervasive since 1998 for minimum wages and 1995 for non-wage costs. Minimum wages seem to be particularly relevant for the determination of employment; (iii) wages seem to have become less sensitive to the cycle, fact that is also partially explained by the behavior of minimum wages and non-wage costs in the last ten years. However, public wages, which may be acting as a “lighthouse”, at least for workers with intermediate or low education, are also affecting overall wages; (iv) thus, the labor market has become less flexible to adjust to macroeconomic fluctuations in recent years. That is, when economic growth declines an increasing part of the adjustment is reached by increasing unemployment. The effect of the cycle on unemployment has two channels: through a decline in employment generation and also through an increase in labor participation rates, particularly among women and the young; and (v) poor performance of productivity growth (see chapter V), is highly correlated with sluggish growth of salaried employment and wages.

- Motivation

Analysis of labor market adjustment refers to the interaction between the demand and the supply of labor and between employers and job seekers. The labor market is said to be in equilibrium when wage levels adjust so that supply and demand are equal and equilibrium is reached through movements of prices (wages) that equate quantities. However, it has been observed that there are some restrictions to achieving this equilibrium. As shown in the previous section, between 1980 and 2003 the key indicators of the urban labor market in Colombia were correlated mainly to the business cycle. In effect, the slow economic growth of the early 1980s became a restriction to labor demand, which, combined with the growth of labor participation driven by women, resulted in a considerable increase of the unemployment rate, which grew to 14.7% in 1986, from 13.4 % in 1982. Over the next years (1987-1995), GDP growth recovered and labor indicators showed an improvement as well. Nevertheless, towards the end of the period (1996-2002) the economy went into a recession that had a severe impact on unemployment, which reached its highest level since there are data available, at an average of 20% in 2000. Despite the recovery of growth during the early 2000s, from 2002 on, the unemployment rate has remained at high levels, even beyond those reached in the downturn of the 1980s (Figure 3.1)

⁴ Detailed literature reviews of all the subjects studied here can be found in the background papers.

Figure: 3.1. Unemployment and Growth



Source: ENH, DANE, and DNP

This chapter, thus, seeks to analyze why labor market adjustment has been so slow and painful after the late 1990s recession, once economic growth resumed. The analysis is presented in terms of misalignments in the labor market caused by labor demand and labor supply factors that were introduced over the 1990s. For instance, labor demand in Colombia has been affected by market distortions, such as the minimum wage and other wage rigidities, as well as by labor and non-labor costs, particularly those introduced by the reform to the social security system (Ley 100 de 1993) that affected firm and individual decisions. On the other hand, labor supply has suffered structural changes in recent years, mainly due to an increase in female participation, and also because structural reforms and GDP growth introduced incentives for increased participation by women and young individuals.

Thus, in order to investigate why adjustment has been so slow, this chapter addresses the following questions: (i) how did the minimum wage affect unemployment? (ii) what are the mechanisms through which Ley 100 influenced the labor market and what was its impact? (iii) have wage rigidities changed over the 1990s? (iv) how did the increasing labor participation put pressure on unemployment and what are the determinants of this increase? and (v) what impact did public labor market wage policies have on the functioning of the entire labor market?

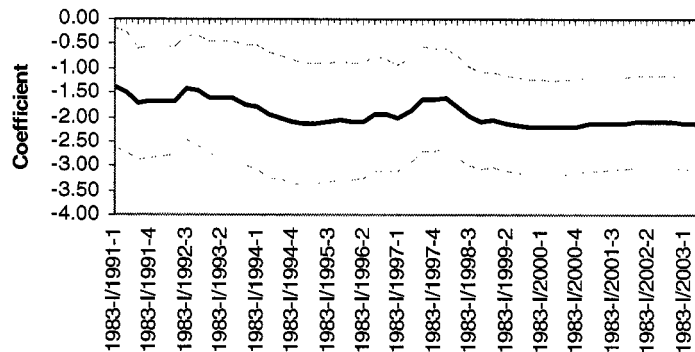
The chapter is organized as follows. The first sub-section presents an analysis of the relationship between the business cycle and unemployment. The second section focuses on the analysis of labor market distortions such as the minimum wage, public sector employment and wages, and non-wage costs. The third section explores the relationship between labor force participation and unemployment. The final section presents concluding remarks.

Box 3.1: National Household Survey (ENH): This chapter relies on the Encuesta Nacional de Hogares (ENH) for urban areas. This survey is conducted by the National Administrative Department of Statistics (DANE), and has been carried out quarterly without interruption since 1976. Its aim is to measure the changes of employment indicators, as well as to compile socio-demographic data, including gender, age, marital status, migration, and education, among others, of the entire population. It is important to stress that DANE used to carry out this survey quarterly until 2000, and continuously after 2001. Therefore, a methodological change emerged and the periodicity changed. Nevertheless, the periodicity used here is quarterly by aggregating the monthly data provided by DANE. Also, the questions used to measure employment (and unemployment) changed somewhat and thus, all the regressions presented include a dummy for the methodological change that takes on the value of one starting in the first quarter of 2001. The survey collects information on 13 metropolitan areas. This chapter will focus on the seven main cities, Bogotá, Cali, Medellín, Barranquilla, Pasto, Manizales, and Bucaramanga, because they are present in all the quarters used.

- The Business Cycle and Unemployment

The strong relationship between unemployment and the economic cycle is widely accepted: strong episodes of growth are associated with unemployment declines, while low or negative growth rates typically cause unemployment to increase. Output fluctuations can affect the unemployment level in two ways. First, GDP contractions can lead to a decline in the demand for labor; and second, reductions in wages can induce labor supply to increase as, for example, women and young people who were not part of the labor market decide to join to compensate for the lower household income. In Colombia, evidence suggests that the relationship between unemployment and output is asymmetric, as unemployment seems to increase more during downturns than it shrinks during upturns. This asymmetry, known as *hysteresis* (or highly persistent) unemployment, points to the tendency of unemployment to persist even once economic deceleration has been reversed. Okun (1962) showed that GDP increases are associated with declines in unemployment and that, in fact, GDP variations have a larger than proportional effect on the labor market. To explore the relationship between unemployment and the business cycle in Colombia, Okun's equations were estimated for the entire sample and by educational levels and gender. In the equations, the dependent variable is unemployment and the independent is economic growth. To analyze this relationship over time, the equations were carried out using moving windows, which began with an eight-year period (32 quarters), gradually increasing the timeframe by one-quarter until the end of the data is reached. Results in Figure 3.2 confirm that, as expected, GDP growth has a larger than proportional effect on unemployment levels, because the coefficients are higher than one in absolute value. The figure also shows that unemployment has become more sensitive to changes in output since the last recession.

Figure 3.2: Unemployment and GDP Growth (Okun's equations)
Coefficients and confidence intervals

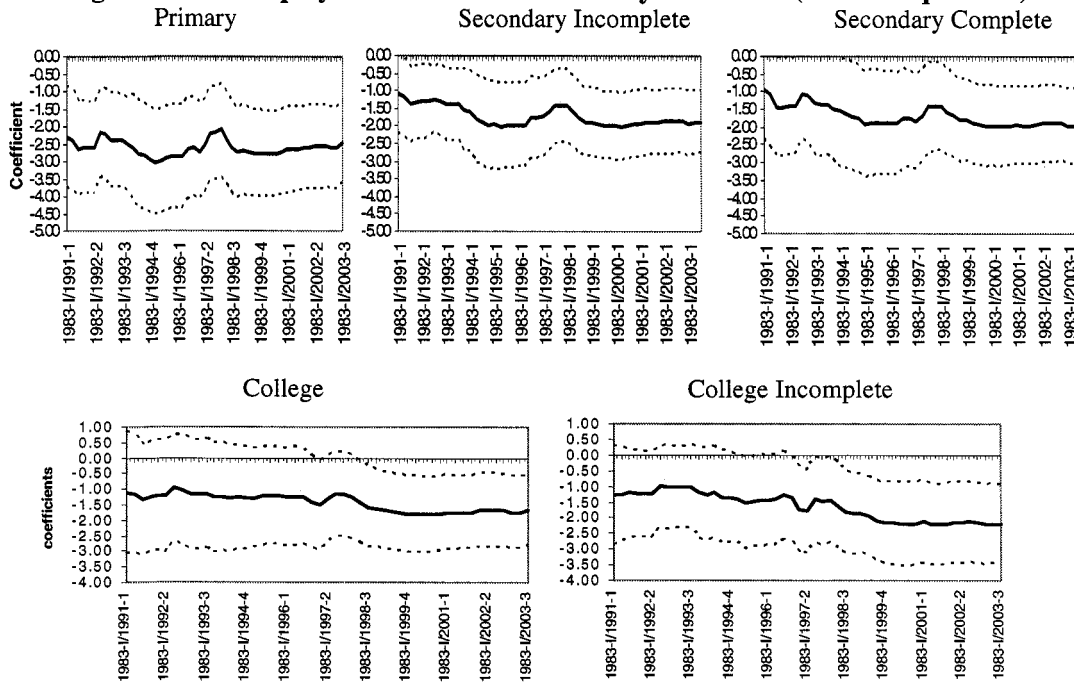


Source: Authors Calculations

Note: dotted lines correspond to the limits of 5% confidence intervals

The same exercise was carried out for the usual educational groups. Figure 3.3 shows the results. As expected, GDP movements have greater effects on lower educated people than on higher educated individuals. It is important to note that for the earlier years unemployment of higher educated workers did not seem to be sensitive to the economic cycle at all (coefficients are not-significant), but after the recession, their unemployment rate became very sensitive to cyclical changes. Note, also, that for all groups cyclical variations in output affect the unemployment rate more since around 1998, indicating that most of the adjustment is now carried out through quantities in the labor market.

Figure 3.3: Unemployment and GDP Growth by Education (Okun's equations)



Source: Authors Calculations

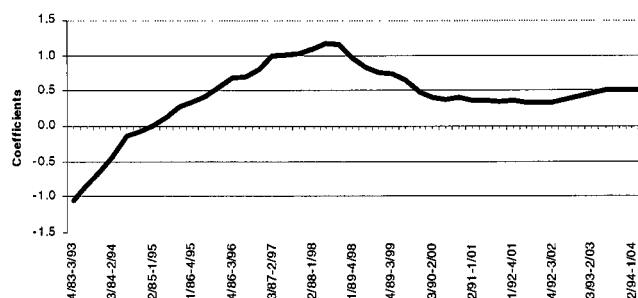
- Factors Affecting the Demand of Labor

In addition to being affected by the business cycle, an array of factors can alter labor market equilibrium. This section will examine market distortions that affect labor demand, focusing mainly on labor costs and the impact that wages and non-wage costs have on the functioning of the labor market.

Wages: changes in real wages affect the equilibrium between labor demand and supply. The notion that wage increases above equilibrium generally trigger surges in unemployment is widely accepted. This could happen mainly for two reasons: a wage increase not accompanied by increases in output demand, or by productivity matching growth, causes the demand for labor to fall; and, wage increases cause labor participation to rise, resulting in an excess of labor supply. In the presence of wage rigidities, the clearing of the labor market cannot be reached, and so unemployment rises.

To explore the relationship between real wages and unemployment in Colombia, Okun's equations were carried out using the same methodology as before, with changes in wages being the independent variable and GDP fluctuations the one on the right hand side (complete methodological explanations can be found in Díaz and Santamaría, forthcoming or Gracia and Santamaría, 2004). The results are reported in Figure 3.4. As can be seen, during the early 1990s the coefficients were non-significant. In the mid-1990s, however, this relationship changed to the expected one, as output began to have a positive effect on wages. The important thing, however, is that towards the end of the period, the sensitivity of wages to changes in aggregate output seems to have diminished, coinciding, importantly, with the implementation of the social security reform and the increase of the minimum wage, detailed in the next sections. In other words, again, wage rigidity becomes higher around 1996 and stays stable from then on, making the labor market adjust more and more through quantities (unemployment).

Figure 3.4: Average Wages and GDP (Okun equations)



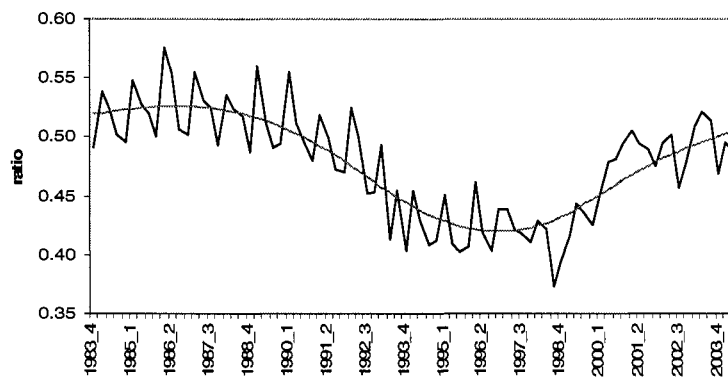
Source: Authors Calculations

Thus, the following sub-sections investigate why the labor market has become more prone to adjust through unemployment, which is equivalent to saying that wages are now less likely to move responding to GDP variations.

Minimum Wages: labor demand can be affected by minimum wages, which may introduce rigidities to the labor market in numerous ways, such as directly increasing labor costs or acting as a “lighthouse”, altering the entire wage distribution. Evidence suggests that increases in minimum wages can cause unemployment and the share of informal workers to grow. On the other hand, labor force growth impedes reaching equilibrium, as the labor market will not fully absorb the increased supply of job seekers.

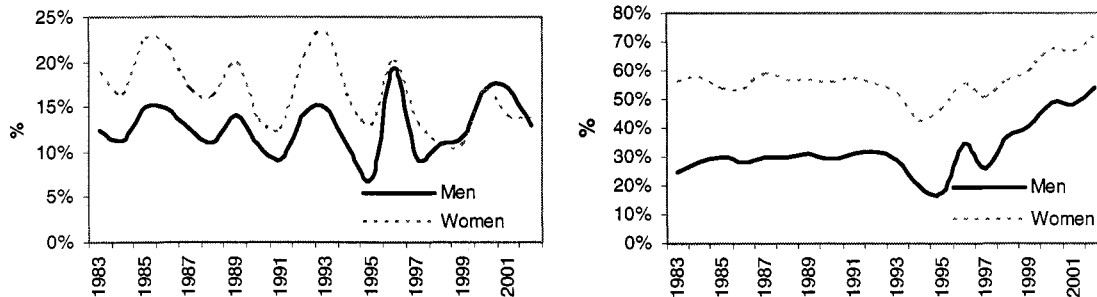
As Figures 3.5 and 3.6 show, the minimum wage in Colombia has increased since 1995, while the ratio between the minimum and average wage levels has grown significantly since 1998 (Figure 3.5), when an important real increase (about 8%) of the minimum wage occurred due to the misalignment of the predicted and actual inflation rates for that year. Also, the proportion of people earning less than the minimum wage increased in recent years (Figure 3.6), which signals that the instrument is increasingly binding and introducing rigidities in the labor market that could result in higher unemployment rates. It is important to note that this increase happened at the same time that the economy was undergoing its worst recession in history, which may indicate that the effects on employment may have been amplified. Also, note that the minimum wage kept growing until the end of the period.

Figure 3.5: Minimum Wage to Average Wage Ratio



Source: Salas (2004)

Figure 3.6: Proportion of Workers Earning less than the Minimum Wage, Salaried Workers (left) and Self-Employed (Right)



Source: Salas (2004)

If these distortions have indeed made the labor market more rigid, introducing binding constraints in the late 1990s, then even a strong reactivation of economic growth would not be sufficient to address the high rates of unemployment. Restoring employment reasonably quickly would require significant deregulation and liberalization of the labor market along with the macroeconomic stimulus. Thus, an econometric exercise was undertaken to analyze the relationship between minimum wages and unemployment, as well as to better understand the effect of the distortions on labor demand. Descriptions of the three methodologies used can be found in Box 3.2.

Box 3.2: The Effect of Minimum Wages on Unemployment, Estimation Methodologies: the central hypothesis of the econometric analysis conducted revolves around the idea that minimum wages have become a binding constraint for employment generation; that is, the minimum wage introduces rigidities and distortions that result in higher unemployment rates. Three methodologies were used to test this hypothesis:

Two Stage Methodology:

This methodology is useful to analyze how the minimum wage affects labor demand while avoiding endogeneity problems. The first step is to estimate a wage equation as a function of the minimum wage (lagged one period), the unemployment rate, and the business cycle measured as the lagged real GDP. The estimation was made by age and gender groups as well. In the second stage, those results are introduced into the labor demand equation, in which the explanatory variables are the minimum wage and GDP. Then, labor demand simulations were carried out; this technique is easy to apply, requiring coefficient estimates from linear regressions for the occupation rate and sample means of the independent variables used in the previous regressions. The aim is to simulate changes in GDP and minimum wages, and see how labor demand is affected. The following identity is used to disentangle the effect of the minimum wages on unemployment:

$$Ur = 1 - \left(\frac{Or}{LPr} \right)$$

where the unemployment rate (Ur) is a function of the occupation rate (Or) and the participation rate (LPr).

Instrumental Variables Methodology:

The idea behind instrumental variables is to find a set of variables, termed as instruments, which are correlated with the explanatory variables in the equation, and uncorrelated with the disturbances. The main purpose of this methodology is to avoid the problems generated by the endogenous relationship between the unemployment rate and the labor participation rate. So, the determinants of the unemployment rate were estimated with the participation rate as the instrumental variable (other covariates included average wages, firing costs, GDP and seasonal controls). All variables entered the estimation in first differences. With the purpose of exploring the differential effects of the minimum wage by educational groups, the sample was divided into the usual five educational groups used in this report.

Cointegration analysis:

The stationary linear combination between two or more non-stationary series within an equation may be interpreted as a long-run equilibrium relationship among the variables. This methodology, termed as Cointegration, is useful to explore the long-run relationship between the urban unemployment rate and the minimum wage rate (two non stationary and cointegrated series, as the tests showed). Therefore, the first step is to determine whether a group of non-stationary series is cointegrated or not, using a cointegration test (Johansen Test). The next step is to run vector error correction models to evaluate whether this relation is positive or negative. As mentioned before, the sample was divided into five educational groups. To measure the differentiated impact through time, the analysis was done using, again, moving windows, which began with a ten-year period (40 quarters), and then a quarter was added until the end of the sample.

Regarding the first methodology, the results of the first stage (wage equation) are shown in Table 3.1, where the dependent variable is the log of the average wage for each group. The results indicate that minimum wage increases cause the entire working population's average wage to increase. On the other hand, increases in the lagged unemployment rate

causes average wages to decrease. Considering the results by gender, it is clear that women's average wages are more sensitive to changes in the minimum wage than men's. Nevertheless, women's wages are less sensitive to rises in the unemployment rate (which proxies the cycle) than that of men. The cycle does not seem to impact groups across age or educational levels differently.

Table 3.1: Results of the Wage Equation

	Average Wage							
	Men	Women	Primary	Secondary	University	Young	Adults	Old
<i>Minimum Wage (t)</i>	0.926 ** (2.49)	1.199 *** (4.08)	0.577 * (1.81)	0.888 *** (2.7)	1.222 * (1.95)	0.964 *** (3.7)	0.795 ** (2.18)	0.868 * (1.97)
<i>Minimum Wage (t-4)</i>	-0.770 *** (-2.85)	-0.466 * (-1.68)	-0.860 *** (-3.76)	-0.587 ** (-2.51)	-0.362 (-0.58)	-0.173 (-0.72)	-0.840 *** (-3.03)	-0.936 *** (-2.72)
<i>Ur (t-4)</i>	-1.272 * (-1.93)	-0.619 (-1.25)	-0.436 (-0.76)	-0.853 * (-1.91)	0.604 (0.62)	-0.557 * (-1.69)	-1.599 * (-1.95)	-0.171 (-0.18)
<i>GDP+(t-4)</i>	-0.056 *** (-2.78)	0.012 (0.63)	-0.050 *** (-2.78)	-0.065 *** (-3.35)	0.015 (0.48)	-0.001 (-0.07)	-0.054 ** (-2.64)	-0.037 (-1.44)
<i>GDP-(t-4)</i>	-0.584 * (-1.85)	-0.220 (-0.75)	0.126 (0.5)	-0.459 (-1.66)	-0.091 (-0.19)	0.457 * (1.69)	-0.702 ** (-2.23)	-0.624 (-1.53)
<i>Constant</i>	10.658 ** (2.33)	3.657 * (1.81)	15.198 *** (3.6)	8.803 ** (2.14)	2.840 (0.65)	2.837 (1.29)	12.918 *** (2.91)	13.225 ** (2.25)
R2	0.32	0.25	0.52	0.52	0.21	0.45	0.47	0.33
No obs	76	76	76	76	76	76	76	76

Source: Salas (2004)

Table 3.2 shows the results for the employment rate (second stage) by socio-demographic groups. These results suggest that the income elasticity of labor demand is higher for men and for workers with primary education, indicating that workers with lower skill level face higher changes in their labor composition as a result of income variations (see below for more on this). The fact that the introduction of a minimum wage (or its excessive growth) generates a shrinking of jobs positions points to the most relevant fact coming out of this table: minimum wages seem to have a negative and significant effect on employment rates. In other words, there is a negative relationship between the minimum wage and labor demand, proxied by the employment rate. In addition, the most affected by the existence of minimum wages appear to be men, intermediately educated workers and adults. However, the effect on the least skilled, the young and women is sizable.

Table 3.2: Results for the Employment Rate

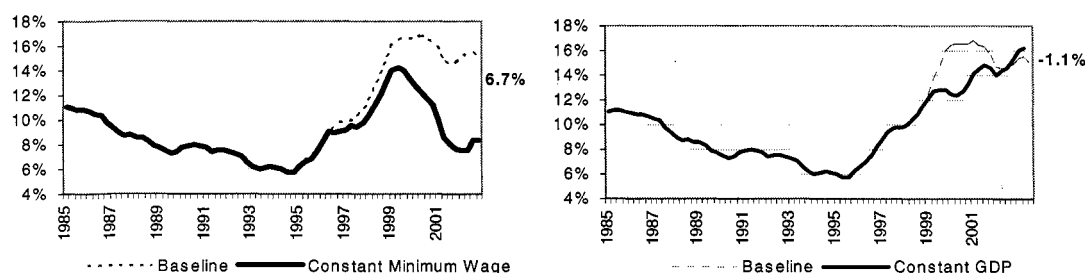
	Occupation Rate							
	Men	Women	Primary	Secondary	University	Young	Adults	Old
<i>Minimum Wage (t)</i>	-0.351 *** (-3.56)	-0.203 *** (-3.02)	-0.160 *** (-3.24)	-0.280 *** (-2.93)	0.017 (0.15)	-0.104 * (-1.73)	-0.151 *** (-2.8)	0.030 (0.33)
<i>Estimated Ave Wage</i>	0.333 *** (3.55)	0.133 (1.37)	-0.099 * (-1.81)	0.320 *** (3.29)	0.023 (0.2)	-0.066 (-0.92)	0.053 (0.92)	0.062 (1.04)
<i>GDP+</i>	0.009 * (1.73)	0.034 *** (10.88)	-0.002 (-0.59)	0.034 *** (5.86)	0.013 ** (2.33)	-0.005 (-0.96)	0.028 *** (9.13)	0.036 *** (8.75)
<i>GDP-</i>	0.172 *** (3.32)	-0.036 (-1.23)	0.075 * (1.9)	0.059 (1.28)	0.142 * (1.96)	0.163 ** (2.67)	0.074 ** (2.24)	0.045 (1.04)
<i>Constant</i>	0.645 (0.6)	1.056 * (1.89)	3.517 *** (5.09)	-0.190 (-0.17)	0.348 (0.36)	2.415 *** (3.49)	1.771 *** (4.12)	-0.537 (-0.55)
R2	0.73	0.86	0.37	0.59	0.12	0.46	0.71	0.80
No Obs	76	76	76	76	76	76	76	76

Source: Salas (2004)

What would have been the unemployment rate if the minimum wage had remained constant since September 1995 and the labor demand had not been affected by the late 1990s recession? To answer these questions, two simulation exercises were carried out, one assuming that the minimum wage remained constant since September 1995 (scenario 1), and the second one that quarterly GDP growth for the recession period equals average GDP growth for the 1990s (scenario 2).

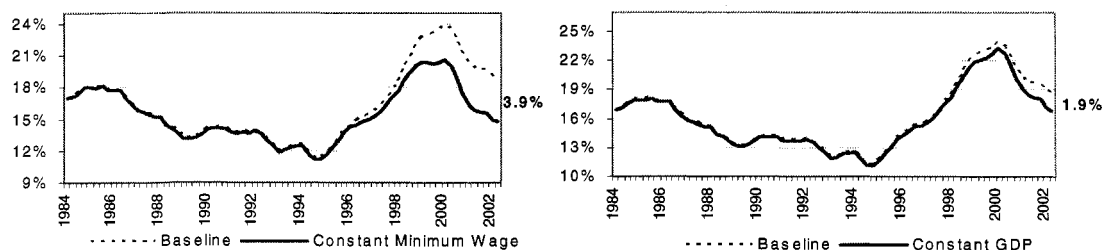
Figure 3.6 presents the results from the simulation of unemployment levels for different socio-demographic groups. In scenario 1 (left), which depicts both the observed and simulated unemployment rate for men, it can be observed that if the minimum wage had remained constant at September 1995 levels, the male unemployment rate would have been 6.7 percentage points lower than it actually was at the end of the period. That is, the unemployment rate would have been around 8%, instead of 14.7%. Scenario 2 (right), on the other hand, shows that if economic growth in the late 1990s had been positive and equal to the decade's average, men's unemployment rate would have actually been 1% higher than it actually was, although at the height of the recession it would have been approximately two points lower. Similarly, Figure 3.7 depicts both the observed and simulated female unemployment rate. The effect of keeping the minimum wage constant is lower for women than that observed for men. Even so, the simulations show that the female unemployment rate would have been 3.9 percentage points lower than the one observed if the minimum wage had stayed in real terms at its 1995 level. The female unemployment rate would have been nearly 2 percent lower in 2002, had the economy not endured the low growth of the recession.

Figure 3.6: Male Unemployment Rate - Simulations



Source: Salas (2004)

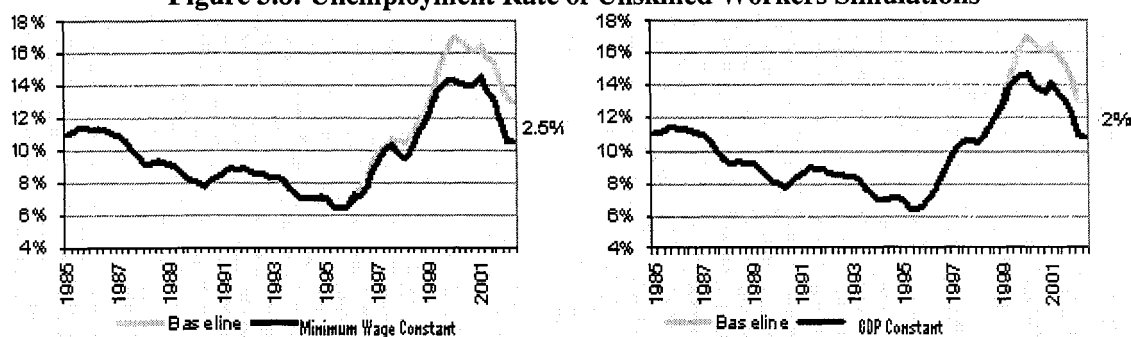
Figure 3.7: Female Unemployment Rate Simulations



Source: Salas (2004)

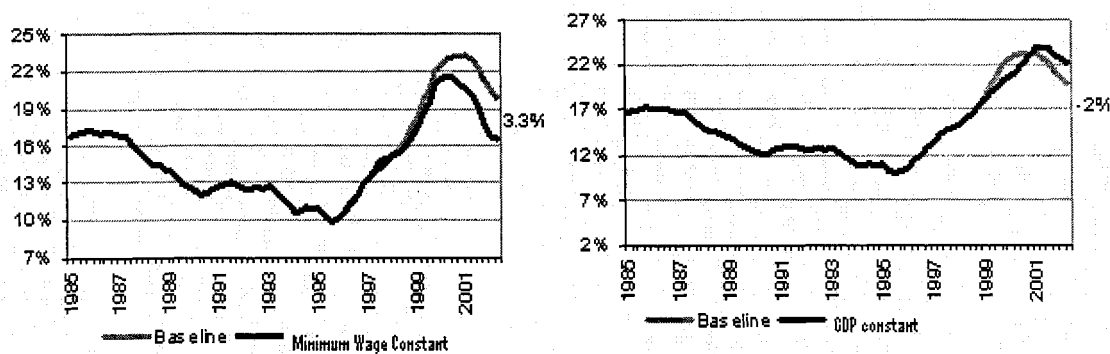
Simulations for the unemployment rate across education levels were also carried out, and the results are shown in Figures 3.8, 3.9 and 3.10. These results depict interesting facts. First, the unemployment rate for unskilled workers (primary level) would have been 2 and 2.5 percent lower under scenarios 1 and 2, respectively. Results for workers with secondary education show that in the first scenario, the unemployment rate would have been lower than the observed one, while in the second scenario, the unemployment rate would have been higher than the actual one. Finally, changes in the minimum wage do not seem to affect the skilled workers' unemployment levels, as no important changes were observed under scenario 1. Scenario 2 does show important differences: unemployment levels for skilled workers would have been 4 percent lower if the economy had grown at a constant pace.

Figure 3.8: Unemployment Rate of Unskilled Workers Simulations



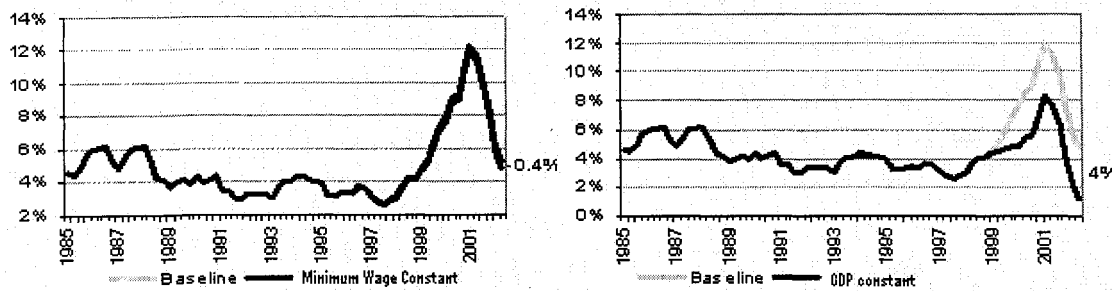
Source: Salas (2004)

Figure 3.9: Unemployment Rate of Intermediately skilled Workers Simulations



Source: Salas (2004)

Figure 3.10: Unemployment Rate of High skilled Workers Simulations

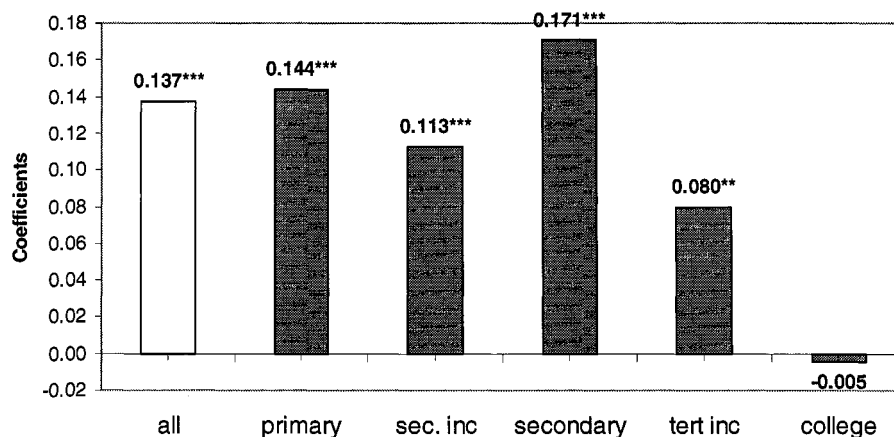


Source: Salas (2004)

In sum, the simulations indicate that the late 1990s high unemployment rate was very likely associated to the rapid growth of the minimum wage of the second half of the decade, combined with the fall of growth rates.

Regressions were also run using the instrumental variables methodology, as described in Box 3.2 above. The sample was sorted by educational groups: primary (1), incomplete secondary (2), complete secondary (3), incomplete university (4), and complete university (5). Results in Figure 3.11 are in line with the previous findings: increases in the minimum wage for the entire group (all), triggered an increase in unemployment levels. Groups with lower and intermediate levels of education appear to be the most vulnerable to changes in minimum wages. For example, an increase of 10% of the minimum wage is associated with a 1.7 percentage points rise of the unemployment rate of high school (secondary) workers. In contrast, unemployment levels for highly educated workers do not seem affected by minimum wage changes, which is due to the high relative wages that this group earns (i.e. the “lighthouse” effect losses power that high in the distribution).

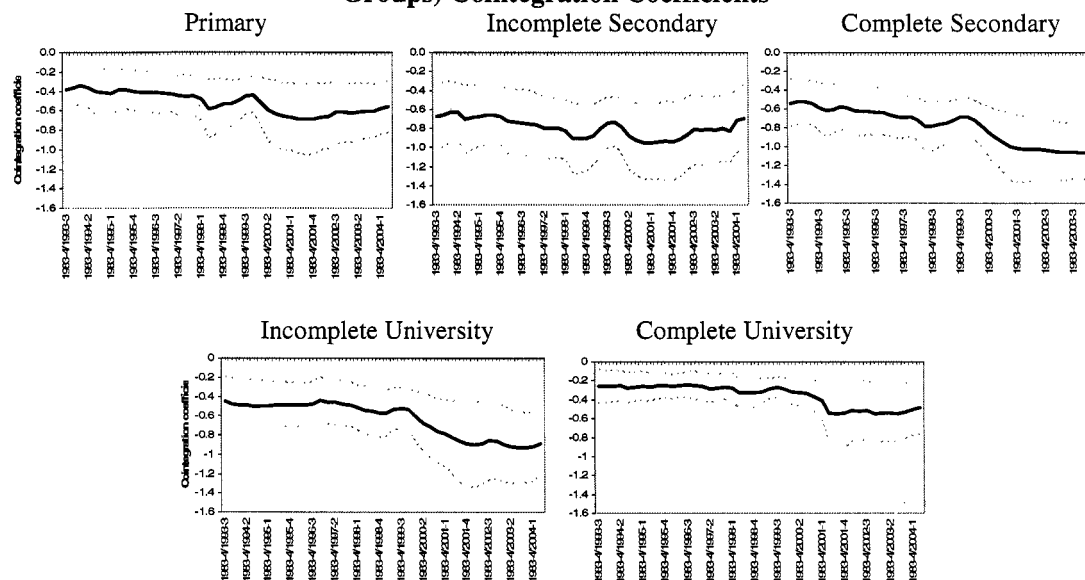
Figure 3.11: Unemployment and Minimum Wages (coefficients form IV regressions)



Source: Authors Calculations

In order to analyze the behavior of unemployment and minimum wages over time (i.e. how the impact on unemployment evolved), and explore whether there is a long-term “equilibrium relationship” between these two variables, an exercise was conducted using time series. Again, the sample was sorted by educational group. Additionally, to explore the marginal time effects, the exercise began with a 10-year period (1983-1993) and gradually added a quarter. As Figure 3.12 shows, there is a strong and positive long-term relation between unemployment rate and minimum wages⁵. Small differences can be observed across educational groups. The unemployment rates for all groups show a positive long- run relationship with the minimum wage, while workers with mid-level education seem to be more sensitive to changes in the minimum wage. This impact appears to increase after the economic recession of the end of the 1990s. The cointegration relationship for highly educated workers, on the other hand, was non-significant in most of the quarters. It is important to note that the relationship became stronger (more positive) after 1998 for all groups, but the highest one.

Figure 3.12: Unemployment and Minimum Wages: Long-Term Relationship (Schooling Groups) Cointegration Coefficients



Source: Author Calculations

In conclusion, the evidence presented suggests that there is a strong relationship between wage rigidities, economic growth, and labor demand on the one hand, and unemployment and wage rigidities introduced by minimum wages, on the other. Moreover, the impact of wage rigidities on unemployment would indicate that they have become more binding since 1998 and that those affected the most are low and intermediate educated workers,

⁵ The vector error correction model has cointegration relations built into the specification so that restricts the long- run behavior of the endogenous variables to converge to their cointegration relationships while allowing for short-run dynamics. The Cointegration term, as the deviation from long run equilibrium, is corrected through a series of partial short-run adjustments. As a result of this relationship a cointegration vector arises, which is a linear relationship between the analyzed variables including the constant, like $(1 - \alpha_0 - \alpha_1)$. Therefore, the results must be interpreted with the contrary sign.

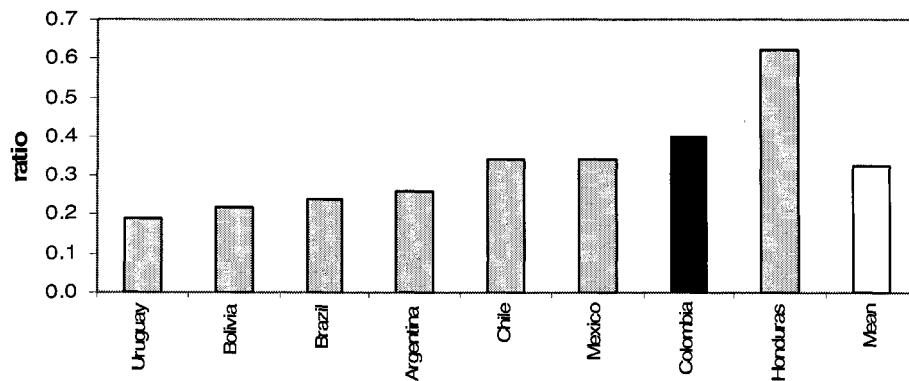
especially the latter. Box 3.3, below, presents some interesting additional evidence and international comparisons of the effects of minimum wage on employment.

Box 3.3: Minimum Wages – Other Evidence and International Comparisons: minimum wages have become a central issue in labor market policy in Colombia, and in the Latin American region as well. This importance stems from its effects on the labor market, formal work, income distribution, and poverty. The literature on minimum wages points out the strong effects on different economic issues. The purpose of this box is to make a brief literature review of this field. Cunningham et al (World Bank, 2005) found that the minimum wage appears to have a strong effect on the labor market. Indeed, both formal and informal sector workers' salaries are affected by the minimum wage. Therefore, the minimum wage is more binding in the informal than the formal sector because of lower relative average wages in the former. This study also shows how the minimum wage can be a tool for poverty and inequality reduction. Although the minimum wage is below the poverty line in households with a single worker, it can serve to increase the incomes of the poorest workers. It also reduces income inequality because the positive impacts shrink to zero in higher earning households. Nevertheless, the minimum wage can be set too high and lead to greater income inequality. In fact, in countries with relatively high minimum wages, the minimum wage can also lead to no wage effects, increased unemployment among the poor, and thus greater poverty and an increase in household income inequality.

Specifically in the Colombian case, Arango (2003) exploited the history of the minimum wage in order to point out that it may alleviate the living conditions of low income families and reduce income inequality. This paper found significant negative minimum wage effects on both the probability of being employed and on work hours; these effects are stronger for women, young people, and the least educated people. Thus, the paper found evidence to prove that the minimum wage ends up being regressive, improving living conditions of the households in the middle and upper part of the income distribution with net losses for those at the bottom. In the same vein, Neumark et al (2003) analyzed the effect of minimum wages in Brazil on the distribution of family incomes using cross section time series data. The estimations provide no evidence that, in the lower-wage metropolitan areas where their effects should be apparent, minimum wages in Brazil lift family incomes at the lower points of the income distribution.

Also, Maloney and Núñez (2003) estimated Kernel density plots for 20 Latin American and Caribbean countries to identify the redistributive effect of the minimum wage on formal and informal sector wages. In addition, their study provides regional evidence on who earns the minimum wage and how it compares to the poverty line. As the following figure depicts, Colombia has one of the highest minimum wage to average wage ratio within the Latin America Region, confirming the conclusions of the main text about how it became a binding constraint.

Minimum Wage to Average Wage Ratio for Selected Countries, 2000



Source: Maloney and Núñez (2003)

Public Sector Employment and Wages: attention now turns to the characteristics of public sector wages, and compares these to those of the private sector in Colombia, with the ultimate goal of assessing their impact on the broader labor market. The public sector is first analyzed in terms of size and workers characteristics to provide a brief background, and then turns to a comparison of public and private wages. A salient feature of the Colombian labor market is the small share of public employment in overall employment. When compared to both Latin American and Caribbean and developed countries (Tables 3.3 and 3.4), Colombia's public employment is clearly among the smallest.

Table 3.3: Government Employment as a Percentage of Total Employment.

	1985	1990	1995
Australia	26.9	23	19.9
Austria	19.6	20.7	22.5
Belgium	20.4	19.8	19.2
Canada	19.9	19.4	19.6
Denmark	29.7	30.4	30.7
Finland	20.1	21.9	25.2
France	22.9	22.8	24.8
Germany	15.5	15.1	15.6
Iceland	16.5	18.3	19.9
Ireland	15.9	14.1	13.4
Italy	15.2	15.6	16.1
Japan	6.4	6.1	6
Luxembourg	11.7	11	11.4
Netherlands	14.9	13.5	12.1
New Zealand	18.1		
Norway	25.2	27.6	30.6
Portugal	13.2	15	
Spain	14.3	14.1	15.2
Sweden	32.7	31.6	31.3
Switzerland	11.2	11	13.9
United Kingdom	21.5	19.4	14.4
United States	14.6	14.5	14
Colombia	10.8	10.2	7.6

Source: Gregory and Borland (1999)

Table 3.4: Government Employment as a Percentage of Total Employment, Latin America

Country	Year	Public sector size
Argentina	1999	15.6
Bolivia	1999	10.3
Brazil	1999	13
Chile	1996	10.9
Colombia	1999	8.7
Costa Rica	1999	17.2
Ecuador	1999	10.7
El Salvador	1999	12.3
Guatemala	1998	8.2
Honduras	1999	9.7
Mexico	1998	14.2
Nicaragua	1993	20.3
Panamá	1999	19.4
Paraguay	1999	11.8
Rep. Dominicana	1994	11.9
Uruguay	1999	16.2
Venezuela	1999	14.9

Source: ECLAC 2000-2001

Table 3.5, on the other hand, presents a summary of socio-demographic characteristics for public and private workers. Significant differences can be observed: public workers are older and more educated, but, on average, work less hours than their private sector counterparts. A larger share of women works in the public sector, though an increase in female participation can be observed in both sectors between 1991 and 2003. As can be seen in Table 3.6, the occupation of public workers is strongly concentrated in services, including education, security and protection, among others, while workers in the private sector are spread over a larger number of activities, with commerce registering the largest share (11.5%).

Table 3.5: Summary Statistics for Public and Private Workers

	Year					
	1991			2003		
	Public	Private	All	Public	Private	All
Age	37.1	31.8	34.6	40.4	33.6	37.1
Hours	45.8	48.5	48.3	47.5	49.3	47.2
% women	43.9	37.9	40.8	47.7	43.1	46.8
Average school.	11.7	8.9	8.6	14.3	10.6	9.9
% no schooling	0.3	1.4	2.2	0.1	0.7	1.7
% primary schooling	11.9	26.1	30.6	3.2	15.3	22.0
% incomplete secondary sch.	16.4	30.5	27.3	3.2	20.4	21.2
% complete secondary sch.	27.6	23.3	20.6	26.0	32.5	27.6
% incomplete tertiary sch.	15.4	8.9	8.0	16.0	13.4	10.9
% complete tertiary schooling	28.5	9.8	11.3	51.5	17.8	16.7

Source: Amarante and Arim(2005)

Table 3.6: Employment by Sector

	Public	Private
Other services	2.69	1.96
Accountants	2.93	1.02
Directors and managers	3.03	3.36
Doctors, odont., etc.	4.15	0.86
Secret oper de tarj	6.21	3.82
Lawyers	6.54	0.24
Administrative Personnel	6.71	4.46
Security and protection	14.86	3.85
Professors	24.04	3.39
Total	71.16	22.95

Source: Amarante and Arim (2005) – (based on NHS)

In Colombia, public employees earn substantially higher wages than private workers. Table 3.7 presents a comparison of relative wages across employment types, where public employees' high wages clearly stand out. The table also shows the evolution of self-employed average wages, which was 86% of the average private sector wages at the beginning of the period, improved slightly in the mid-1990s, only to collapse to a meager 61% towards the end of the period. The public sector's disproportionately high wages, which represent a transfer of the Colombian society to a very limited group of workers through taxes, may be introducing rigidities in the aggregate labor market if they act as a "lighthouse".

Table 3.7: Relative Wages 1991-2003 (Compared to Private Salaried)

	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
Private	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Public	1.47	1.54	1.66	1.48	1.49	1.64	1.71	1.47	1.87	1.91	2.03	1.92	2.00
Domestic empl.	0.34	0.33	0.34	0.33	0.37	0.37	0.39	0.35	0.40	0.39	0.38	0.35	0.40
Self employed	0.86	0.85	1.01	0.97	1.12	0.91	0.90	0.77	0.65	0.76	0.57	0.69	0.61
Entrepreneur	2.27	2.14	4.32	3.18	3.38	2.38	2.13	2.42	1.85	2.08	1.76	1.75	1.60

Source: based on NHS

Not only are public employees' wages particularly high, but their evolution over time is very different than that of the other occupations. Indeed, the public sector registered increases throughout the period, despite the collapse observed in other occupations after the recession. For instance, the average wage of public employees was significantly higher than that of private employees during the 1990s and early 2000's (Figure 3.13). Public employees earned 60% more than private workers in 1996, and the gap increased over time, reaching 130% in 2003.

Figure 3.13: Average Hourly Wage Differential Between Public and Private Workers



Source: Amarante and Arim (2005)

The Wage Premium: what is the public-private sector wage differential and how is it determined? The analysis focuses on figuring out the extent to which factors such as higher human capital endowments in the public sector, and institutional or political dynamics can explain the wage gap between the public and the private sectors. Box 3.3 describes the methodologies used to carry out this analysis.

Box 3.4: Methodologies of Public-Private Wage Differential: (i) the aim of this methodology is to estimate the public sector premium -or penalty- through pooled data analysis. The econometric analysis is carried out taking into account the next equation:

$$W_i = X_i\beta + \sum_{j=1}^k \delta_j D_{ij} + \varepsilon_i$$

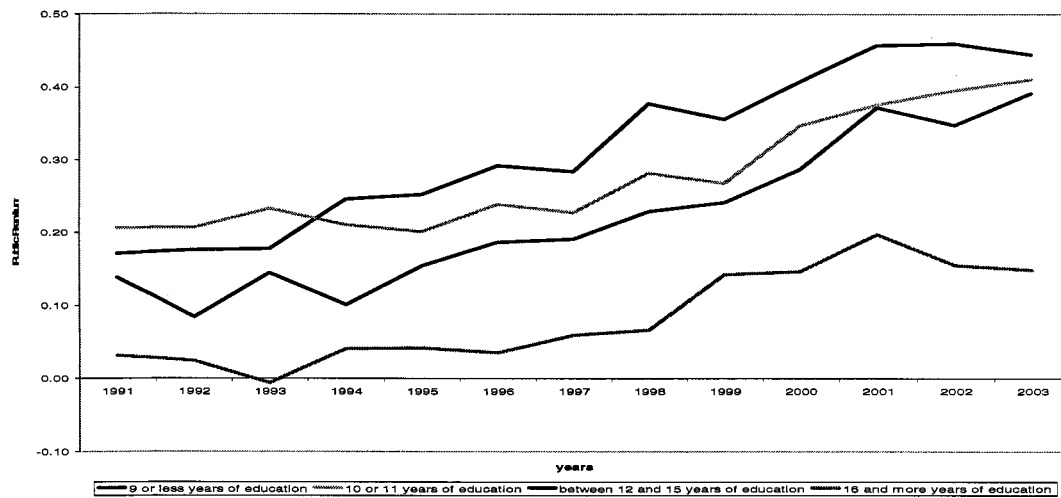
where W_i is the logarithm of the real hourly wage, X_i is a subset of variables that represent individual productivity and socio demographic characteristics, D_i is a set of dummy variables that discriminate between three groups of workers –public, private and self-employed. The important feature in this regression is the term δ_j , which reflects the public sector premium-penalty, controlling for other factors relevant for wage determination.

(ii) **Oaxaca Decomposition:** the gap between public and private wages estimated with the methodology described before might not be the most rigorous approach, because the returns to other characteristics (e.g. education) are restricted to being the same for both public and private workers, and there could exist some selection bias. To address this, Oaxaca decompositions are used, as they allow decomposing total wage differential in both explained and unexplained factors. The explained factors are the differences in characteristics or endowments of the workers, while the unexplained factors are attributable to differences in market returns to those endowments.

(iii) **Switching Model:** the third methodology corrects for selection bias. The intention of the exercise is to identify non market-based determinants of the public wage premium, to obtain a measure of the distortion created by public wage policies. In particular, a measure of the premium that nets out wage differences due to differences in the characteristics of public and private sector workers is sought. For this purpose, an econometric model (of the “switching” type) is estimated which allows workers to choose their sector of employment by comparing each sector’s expected earnings and is estimated through full information maximum likelihood. The model consists of two interrelated elements: a wage relationship for each sector, and one defining the sector of employment. In this way, productivity-related characteristics and job attributes –education, experience, occupation type, sector of activity, region and gender– are considered, which makes it possible to obtain an estimate of the average non market-based public wage premium/penalty and to identify the groups of workers that benefit the most from public sector employment. See Amarante and Arim (2005) for complete details of this model.

The premium of unskilled public workers is significant and exhibits an increasing trend, while highly educated public workers exhibit decreasing returns. For workers with over 15 years of schooling, the premium is significant since 1994, but it is lower than for the rest of the workers (Figure 3.14). Finally, the results show that, without controlling for selection bias and among public workers, the premium for men is higher than that for women.

Figure 3.14: Public Sector Wage Premium (private=1), 1991-2003.



Source: Amarante and Arim (2005a)

The following Table (3.8) reports the estimated wage premium for the period 1991-2003, taking into account the sector choice made by an individual. The first column depicts the observed average wage differentials between public and private workers (the unconditional one). As can be seen, public employees earn higher wages than private workers, a ratio that increases over the period. ATE1 reflects the average treatment (the treatment is to be a public worker) effect after controlling for workers observable characteristics, but not correcting for selection bias (i.e. the second methodology). This result indicates that, after controlling for observables, the public sector wage premium is considerably lower than the non-parametric estimate depicted in the first column. The results are different when the premium is calculated taking into account the unobservable characteristics, as can be seen in the ATE2 column (the third methodology). Indeed, the average treatment effect considering unobservable characteristics (ATE2) is higher than ATE1. These results indicate that there is a systematic earnings gain from working in the public sector that is unrelated to productivity or economic performance. This wage distortion increased in the second half of the decade.

However, the average premium may be hiding important heterogeneity, crucial to explain the reasons for the presence of such a premium. The framework allows the identification of the groups of workers that benefit most from public employment. The results indicate that the premium is significantly higher for women than for men, and that it decreases with skills (proxied by education attainment). In this context, the premium for the most skilled has been declining steadily since 1999, reflecting public policies oriented at containing the deficit. Also, and importantly, a significant wage gap was found for highly

skilled workers within the public sector and across branches, with highly educated workers in the executive power earning substantially less than their peers in legislative or judiciary. There is no reason to justify these large differences. These findings are consistent with those for other Latin American countries (Panizza, 2001)

Table 3.8: Mean Treatment Parameters

	Uncond.	ATE 1	TT1	ATE2	S.E of	TT2	S.E of TT2
1991	0.691	0.178	0.170	0.836	0.090	0.344	0.047
1992	0.694	0.180	0.184	1.346	0.057	0.354	0.047
1993	0.859	0.177	0.193	1.110	0.095	0.396	0.059
1994	0.643	0.177	0.150	0.835	0.162	0.361	0.054
1995	0.731	0.180	0.158	0.844	0.114	0.341	0.045
1996	0.883	0.191	0.187	0.667	0.171	0.371	0.044
1997	0.937	0.220	0.192	0.882	0.144	0.420	0.055
1998	0.924	0.226	0.193	1.060	0.111	0.413	0.048
1999	1.203	0.300	0.266	0.878	0.214	0.431	0.063
2000	1.379	0.324	0.281	1.264	0.118	0.427	0.052
2001	1.434	0.355	0.346	1.165	0.127	0.494	0.047
2002	1.283	0.371	0.313	1.014	0.146	0.431	0.049
2003	1.225	0.387	0.296	1.406	0.124	0.329	0.051

Source: Amarante and Arim (2005)

Explanations for the existence of this premium include the higher incidence of unionization in the public sector, as well as the monopolistic situation of the government and the relevance of the goods and services it provides, which grants further power to the unions in wage negotiations. In addition, it is possible that high public wages do not derive from the public sector trying to attract the best workers, but from its inability to increase the productivity of its workers due to high firing costs (Panizza, 1998). There is abundant evidence that meritocratic recruitment and promotions offer the right incentives and have a positive effect on the quality of the public sector. These results, however, should be interpreted with caution given the heterogeneity present in both the public and private sectors, and considering recent trends in public and private wages and employment.

Consequences - The Effect of Public Wage Policies on the Labor Market: what is the impact of this non market-based public wage premium on the broader labor market? High public wages and indexation, job guarantees, lifelong employment security, and fringe and non-wage benefits may distort the price and supply of labor. Furthermore, public sector wage policies may pose upward pressure and downward rigidity on the entire wage structure of the formal labor market, contributing to the generation of unemployment, as well as shifting employment to the informal sector (Lindauer, 1991). The framework provided by Mincer (1976) to capture the effect of exogenous rigidities on employment is used in this context to measure the effect that the public wage premium has on the overall employment rate. It estimates the effect of the (conditional) ratio of public to private wages on the overall employment rate, controlling for the business cycle. Since the effect of the wage premium on employment may vary across groups, the model was also estimated separately by school level, gender, and per capita income of the household. Additional estimations were carried out excluding the self-employed, as they

face higher levels of wage flexibility. Results are very robust to different specifications. They showed that the public wage premium has a statistically significant negative effect on total employment. In fact, for all workers, the wage differentials are negatively related to changes in the employment rate. An increase of 10 points of the public-private wage differential reduces overall employment by 0.5 percentage points. This effect is higher for women than for men. Considering schooling levels, the effect of wage differential is only significant for unskilled workers (less than six years of schooling).

Table 3.9: Groups for Panel Data Estimation

		18-24	25-29	30-39	40-49	50 y+
Men	Primary	group 1	group 6	group 11	group 16	group 21
		group 2	group 7	group 12	group 17	group 22
		group 3	group 8	group 13	group 18	group 23
	Secondary	group 4	group 9	group 14	group 19	group 24
	Tertiary	group 5	group 10	group 15	group 20	group 25
Women	Primary	group 26	group 31	group 36	group 41	group 51
		group 27	group 32	group 37	group 42	group 52
		group 28	group 33	group 38	group 43	group 53
	Secondary	group 29	group 34	group 39	group 44	group 54
	Tertiary	group 30	group 35	group 40	group 45	group 50

Source: Amarante and Arim (2005a)

In order to shed light on the distribution of the effects across different groups, a similar model was estimated, but using a pseudo-panel. The sample was divided by skill level, taking into consideration age, gender and education, producing 50 groups (Table 3.9). The dependent variable was the rate of employment for each group, and the independent variable was the ratio of public to private wages⁶. The results are in line with those presented above, as, once again, the wage differential has a negative significant effect on the employment rate of the reference group of about the same size as the one found in the previous exercise. In Table 3.10, the marginal effect of the wage differential on employment is depicted for each group. The red cell is the reference group, which is the group of low-educated men between 25-29 years. White cells point out those groups whose marginal effect is not significantly different to the reference group, which means the wage differential has a negative effect on those groups of the same size than the reference one. Gray cells point out those groups whose marginal effect is significantly different to the reference group, which are the most affected groups. Green cells point out those groups whose marginal effect is significantly different to the reference group and higher than zero; therefore they are positively affected by the wage differential. Finally, orange cells point out those groups whose marginal effect is not significantly different from zero.

In general terms, the results indicate that men are negatively affected by the public-private wage gap. The exceptions are young men with secondary or tertiary education, for which (groups 4, 5 and 9) the wage differential does not seem to have any effect on employment. Men older than fifty and adult men (40-49) with primary schooling are more severely affected by the wage gap. Results are considerably different for women,

⁶ The model controls for group fixed effects as well as year and quarter effects.

who do not seem to be affected by the wage gap between private and public workers, or in any case, the effect is positive. The exception are young women with high education (30 and 35), where a negative and significant effect is detected. The positive effect is found for women with low education, which may be related to their low attachment to the labor market.

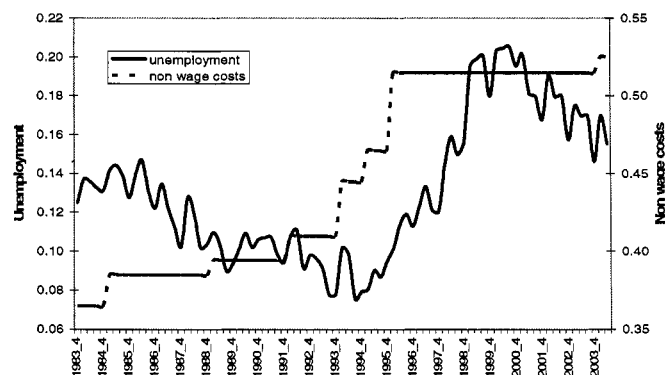
Table 3.10: Marginal Effects of Wage Differentials on Employment by Groups (reference group: males, 25-30, 5 or less years of schooling)

		18-24	25-29	30-39	40-49	50 y+
Men	Primary	group 1	group 6	group 11	group 16	group 21
		group 2	group 7	group 12	group 17	group 22
		group 3	group 8	group 13	group 18	group 23
	Secondary	group 4	group 9	group 14	group 19	group 24
	Tertiary	group 5	group 10	group 15	group 20	group 25
Women	Primary	group 26	group 31	group 36	group 41	group 46
		group 27	group 32	group 37	group 42	group 47
		group 28	group 33	group 38	group 43	group 48
	Secondary	group 29	group 34	group 39	group 44	group 49
	Tertiary	group 30	group 35	group 40	group 45	group 50

Source: Amarante and Arim (2005a)

Non-Wage Costs: during 1990-1994 two important transformations to labor related legislation were introduced. The first one, in 1990, was Law 50 of 1990 (labor reform), whose main objective was to make the labor market more flexible by facilitating the hiring and firing process. The second one was Law 100 of 1993, which reformed the Colombian General System of Social Security in Health and Pensions, creating an integral system that introduced competition into both services. The reform introduced several changes to the health sector by determining the amount and distribution of the payroll contributions between the contributory and subsidized affiliation regimes. Since the reform, the affiliation to one of these regimes depends on the income level of the worker: those who have the ability to pay are affiliated to the contributory regime, paying through contributions directly from the payroll, while the lower-income population is enrolled in the subsidized regime. Under the contributory regime, individuals must make monthly payments equaling 12% of their earnings, split between the employer (2/3) and the worker (1/3). The pension system also changed, since the social security reform allowed voluntary transfers from the traditional pay-as-you-go system to a fully funded system with individual accounts. Due to the modification, employers and employees pension contributions increased to 13.5% of earnings (14.5% if the worker earns high wages). Box 3.4 describes non-wage costs in Colombia in some detail.

Box 3.5: Non-Wage Costs in Colombia: non-wage costs in Colombia are composed, firstly, of contributions directed to finance health, pensions and professional risks. Additionally, there are (i) “Cesantías” (individual accounts funded by the employer in the amount of one month’s wage per year that act as a kind of unemployment insurance); (ii) paid vacations (half a month wages per year); (iii) Parafiscales, which are taxes to fund a variety of social protection-type services provided by SENA (training), ICBF (family and child welfare) and the “Cajas de Compensación Familiar (CCFs)”, which provide a variety of services for formal sector workers, ranging from cash subsidies to recreation. They amounted to 8% (4 for ICBF, 2 for SENA and 2 for CCFs) but the 2002 labor reform introduced one more point to finance the unemployment insurance; (iv) mandatory bonuses (4.2% of the payroll); (v) severance payments for unjust dismissals (around 5.2% of the payroll after the 2002 reform). The 1993 social security reform increased health contributions from 7 to 12%, while contributions for pensions were increased from 4.5 to 13.5% (14.5% for high earners) and the 2002 pension reform increased them by a further 2%. The only component among these that has gone down is (v), which decreased from about 12% in 1989 to the 5.2% mentioned. Most of the reduction came about from the 1990 labor reform, which reduced it to 7%. In fact, total non-wage costs have increased from some 47% of the payroll in the 1980s to 60% in 2004. If item (v) is not counted, the increase is from 35 to 55%. The graph below shows the strong correlation between non-wage costs and unemployment, which prompted the authors to study the issue more rigorously.



Source: ENH, Author Calculations

Evidence suggests that the rise in non-wage costs for firms and the change in employees’ contributions that Law 100 introduced may have had an impact on the labor market and triggered a jump in unemployment and informality (the latter analyzed in the next section). The Figure in Box 3.5 is very telling about the strong correlation between unemployment and non-wage costs. Increases in unemployment could result from: (i) a decline in labor demand due to higher non-labor costs (prices) that hurts firms’ hiring capacity; and (ii) an increase of labor supply triggered by the improved conditions and benefits that the labor market offers. Increases in the supply of labor, however, will be conditioned by the substitution and income effects. Understanding the prevalence of one of these two effects is crucial to grasping the net effect of the reform on labor supply.

Box 3.6: The Effect of Law 100 on Unemployment, Estimation Methodology: econometric exercises were carried out to analyze the relationship between social security and the increase of the unemployment level. The analysis was divided in two: (i) the effects of Law 100 on labor supply; and (ii) the effects on labor demand.

Law 100 and Labor Supply

The aim was to measure the impact of Law 100 on participation rates. Probabilistic and binary models (logit) were used to study the determinants of participation for men and women, separately. To solve for endogeneity between participation and wages, auxiliary estimations were carried out, using Mincer equations, which model the earnings as a function of individual skills (human capital) and socio-demographic characteristics. These models use Heckman's methodology to correct for selection bias. The main assumption is that the law introduced incentives that affect the individual's decision to participate in the labor market (e.g. greater access to health and pensions systems). Net contributions paid by the worker, which were around 5.7% before the law's implementation, grew to 7.8% with the law, as the next table depicts. The signs to the left denote if the variable encourages (+) or discourages participation (-). The last variable (transfer) denotes the portion of the employer's contribution transferred to the worker in the form of lower wages and is taken directly from Kugler and Kugler (2003):

	Before	After	Change
(-) Employee pension contributions	(1/3)x8% = 2.7%	(1/4)*13.5% = 3.4%	0.7%
(+) Employer pension contributions	(2/3)x8% = 5.3%	(3/4)*13.5% = 10.1%	4.8%
(-) Employee health contributions	(1/3)x7% = 2.3%	(1/3)*12% = 4.0%	1.7%
(+) Employer health contributions	(2/3)x7% = 5.3%	(2/3)*12% = 8.0%	2.7%
(-) Employee social security contribution		1.1%	1.1%
(-) Transfer		1.9%	1.9%
Total change	5.7%	7.8%	2.1%

Thereafter, these non-wage costs were introduced into the participation equation through changes in the real wage; the predicted wage (from the Mincer equations) was multiplied by this increase since 1995, the year of the law's implementation, and then, the participation was forecasted using both parameters estimated and the new wage. Once the participation was predicted, unemployment rate simulations were made keeping the occupation rate constant. The simulations were calculated using the following identity:

$$Ur = 1 - \frac{Er}{LFPr}$$

Where the unemployment rate (Ur) is one minus the employment rate (Er) – labor force participation (LFPr) ratio.

Law 100 and Labor Demand

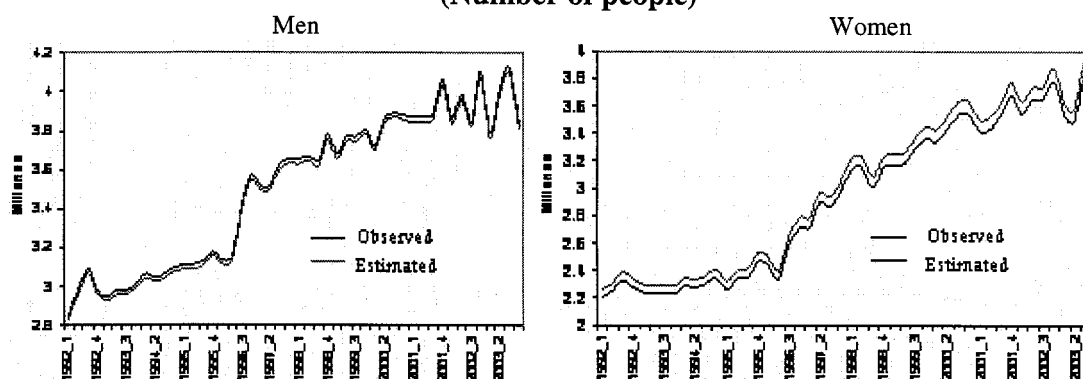
Law No. 100's effects on labor demand were explored using a very similar methodology. Specifically, this exercise used the labor demand coefficients estimated by Ocampo, Sanchez, and Tovar (1999). The labor demand was modeled as a function of sectoral output, real wages, and non-wage costs. The wage elasticity of labor demand estimated by them (-0.234) was introduced here first to forecast the demand and secondly to predict the unemployment rate. In addition, the calculation of the change in the employers' contributions introduced by Law No. 100 is detailed in the following table:

	Before	After	Change
Employer pension contributions	5.3%	10.1%	4.8%
Employer health contributions	4.7%	8.0%	3.3%
Transfers		1.9%	1.9%
Total	10.0%	16.2%	6.2%

As in the labor supply analysis, all this information was used to calculate the counterfactual unemployment rate. But, in this case the labor force participation rate remains constant, while the employment rate changes as a result of the changes on non-wage costs.

Law 100: effects on labor supply: the analysis attempts to discern what would be the labor force participation rate if Law 100 had **not** been implemented. Figure 3.16 presents both the observed and estimated Participation Rate for men and women. As can be seen, the estimated male participation is lower than the one observed. On the contrary, the one estimated for women is higher than the one observed due to the estimated elasticities.

**Figure 3.16: Observed and Estimated Labor Force Participation
(Number of people)**



Source: ENH 1992-2003 , Prada(2004)

Table 3.11 depicts a comparison of changes in unemployment levels with and without the implementation of the law due only to changes in participation rates. It appears that the reform generated an increase of participation, which translated into higher unemployment.

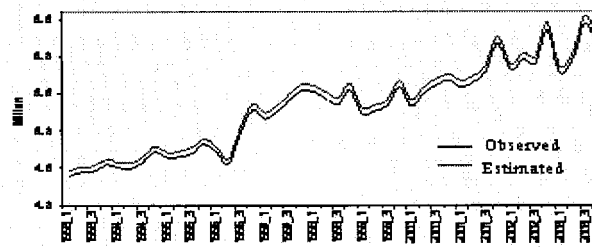
Table 3.11: Observed and Estimated Unemployment Rate

Year	Observed	Estimated (without law 100)
1992	9.4%	
1993	8.5%	9.2%
1994	8.1%	8.7%
1995	9.3%	10.0%
1996	11.9%	12.5%
1997	12.1%	12.8%
1998	15.0%	15.7%
1999	20.1%	20.7%
2000	20.5%	21.2%
2001	17.9%	18.6%
2002	17.4%	18.1%
2003	15.5%	16.2%

Source: Prada (2004)

Law 100: effects on labor demand: as economic theory would predict, results show that an increase in the labor costs caused a reduction in labor demand. Figure 3.17 presents both observed and simulated employment in the absence of Law 100, which would have been higher than the observed one.

**Figure 3.17: Observed and Estimated Employment
(Number of people)**



Source: ENH-DANE, Prada (2004)

The resulting unemployment rate is presented in Table 3.12. As can be observed, unemployment grew by an average of 1.3 points once Law 100 was implemented. If both the supply and demand effects are considered together, it is estimated that, on average, the unemployment rate would have been 0.8 points lower than the levels observed between 1995 and 2003. Note that this value depends crucially on the value of the elasticity of labor demand to labor costs. Since the one used here seem to be in the low range, it is safer to say that the net effect was in the range of one to 1.8 percentage points.

Table 3.12: Observed and Estimated Unemployment Rate

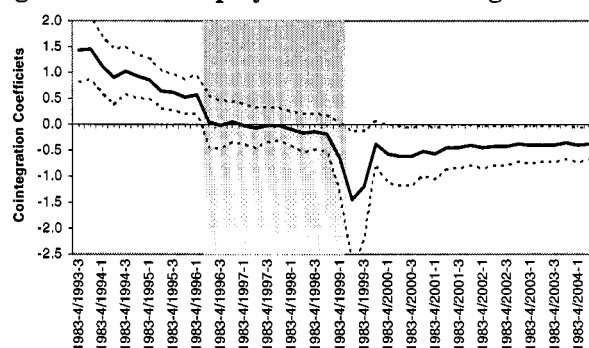
Year	Observed	Estimated (without law 100)
1992	9.4%	
1993	8.5%	7.1%
1994	8.1%	6.7%
1995	9.3%	7.9%
1996	11.9%	10.5%
1997	12.1%	10.8%
1998	15.0%	13.7%
1999	20.1%	18.8%
2000	20.5%	19.3%
2001	17.9%	16.6%
2002	17.4%	16.1%
2003	15.5%	14.2%

Source: ENH- DANE, Prada (2004)

In what follows, the relationship between unemployment and non-wage costs is analyzed overtime to better understand whether there is a long-term equilibrium between them (i.e. Cointegration relationships are estimated). In addition, to explore the marginal time effects, the exercise begins using data covering a 10-year period (40 quarters), gradually adding a quarter until the end of the data.

Figure 3.18 presents the resulting coefficients of the cointegration analysis between unemployment and non-wage costs. Three very different periods can be identified. Until the mid 1990s, the relation between unemployment and non-wage costs was negative (i.e. the coefficient is positive). Between the time of the implementation of Law 100 (late 1995) and the first quarter of 1999 (gray area) the relationship seems to be neutral. Finally towards the end of the period, which coincides with the late 1990's recession, the relationship becomes positive, which provides additional strong evidence that the increase in non-wage costs induced by Law 100 was behind the jump in unemployment that followed the economic recession.

Figure 3.18: Unemployment and Non Wage Costs



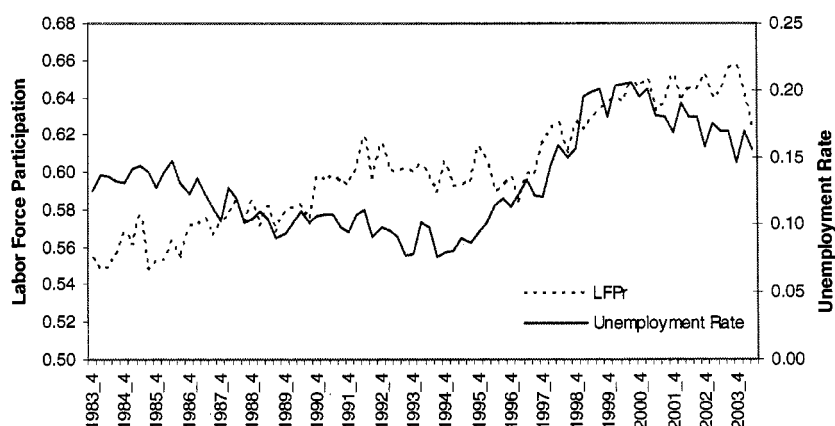
Source: Authors' calculations

Thus, this section provided enough evidence to conclude the following: (i) the cycle has played a very important role in the behavior of employment and unemployment, especially since 1998 when the sensitivity of unemployment to movements of GDP increased or, what is the same, wages became more rigid (their sensitivity to GDP declined); and (ii) this reduced wage sensitivity is explained by important increases in the minimum wage, non-wage costs and, to a lesser extent, a surge of the public-private wage differential. Thus, these factors, especially the first two, were shown to have been crucial for the increase in unemployment, and its stabilization at higher levels that occurred in the latest years. Also, it is important to note that these rigidities were shown to affect the least skilled segments of the population more, especially the minimum wage, which were supposedly those segments that were going to be protected by them.

- Labor Force Participation

Over the last decades, the supply of labor has undergone important changes, which could have exacerbated the labor market adjustment problem. Labor force participation in Colombia, which is strongly related to the unemployment rate (Figure 3.19), has grown uninterruptedly since the mid-1980s.

Figure 3.19: Unemployment Rate and Labor Participation Rate



Source: ENH- DANE

The labor force participation growth can be largely explained by the continuous increase of female participation, which, as Figure 3.20 shows, has been rising steadily as a consequence of both short-term and structural influences. Short-term changes relate primarily to fluctuations in the business cycle. Structural changes, on the other hand, are associated with deep social changes, such as greater and more egalitarian educational access, as well as fertility rate declines.

Figure 3.20: Unemployment and Labor Force Participation by gender



Source: ENH- DANE

The determinants of the probability to participate in the Colombian labor market for the total sample (men and women) differ across groups. For example, when compared to the control group (unfinished primary), unskilled workers participate less in the labor market than those with higher levels of education. In the same way, people aged between 12 and 17 years and those older than 55 years participate less than the other groups. These results are in line with the life cycle model of labor force participation, which establishes a lower probability for entering the labor market for the youngest and oldest people than for the prime age individuals. In addition, other household members' income has a negative effect on the probability of participating in the labor force, which probably points to the fact that a household member generating a higher incomes provides a disincentive for the other members to work.

Additionally, this section explores the labor force participation determinants by gender. As theory and empirical evidence have already indicated, results obtained point to strong differences in the determinants for men and women for entering the labor market. Principally, there are important differences in the impact of educational attainment on the probability of entering the labor market. Uneducated men participate less than those that have not finished the primary level; for the other groups, education has a positive impact, although for some of them results are non-significant. The positive effects of the level of education are significant for women at all levels. Also, the decision to participate may vary between men and women depending on their marital status. For example, unmarried men participate less than married men, while unmarried women participate more. Furthermore, the presence of children under 7 years has a negative impact on female participation, but a positive impact on male's.

Box 3.7: Labor Supply and Unemployment in the Late 1990s, Determinants of Labor Force Participation:

to find the determinants of urban labor supply, econometric estimations were carried out for the period 1984-2002. The labor supply equation was estimated through cross sectional binary choice models (probit or logit). These models were used to find the determinants of the probability of participating. The dummy dependent variable is equal to one if the person belongs to the active population, and zero if not. Both individual and household variables were included as explanatory variables. The individual ones refer to educational attainment (unfinished and finished primary, secondary, university, and higher), age, relationship with the head of household, and marital status. To explore the role that economic growth plays in participation, the real income of the other members of the household was included. These exercises used the ENH for the seven main cities. To explore the differential gender effects on the probability of being in the active population, the sample was divided into women and men. An extension of the Blinder-Oaxaca decomposition technique⁷ widely used to identify the separate contributions of group differences in measurable characteristics, such as education, age, marital status, etc. in participating on the labor market, was then estimated.

Finally, as the aim of this section is to further explore the role that labor supply changes play in the misalignment of the late 1990s, some simulations were carried out using the parameters and the variables' means to predict the unemployment rates without structural and short-term changes in participation.

So far, results have shown whether the relationship between dependent and independent variables is positive or negative. Now, the analyses will try to identify and measure the extent to which group characteristics affected labor force participation. The sample was divided into three-year periods on different points of the economic cycle: 1984-1986/1987-1989 (contraction); 1984-1986/1993-1995 (prosperity) and 1993-1995/1999-2001 (recession); also, group decompositions were carried out.

Table 3.11 shows that the male force participation rate grew 1.2 percentage points in the first period (1984-1986/1987-1989), which may have resulted from a decline in the youngest portion of the population (12-17 years group), an increase in the portion of people between 25 and 34 years, and the growth of the proportion of male household-heads. The most interesting result refers to the income of the other household members, which suffered a decrease and caused a 6% growth in the participation rate. The labor force participation rate increased 1.9 percentage points between 1984-1986 and 1993-1995. This participation did not vary with age; rather, an increase in the participation of highly educated people (secondary, college and post-graduate) had more impact on that change. On the contrary, increased incomes of other members of the household as a result of prosperous economic activity caused a decrease of this rate of around 12%. The results from several other periods show similar patterns.

⁷ The common Blinder-Oaxaca decomposition technique cannot be used directly if the outcome is binary and the coefficients are from a logit or probit model.

Table 3.11: Decomposition Results for Male Labor Force Participation

Variables	87-89/84-86			93-95/84-86			99-01/93-95			99-01/84-86		
	Mean Change	LFP Change		Mean Change	LFP Change		Mean Change	LFP Change		Mean Change	LFP Change	
Observed	0,012			0,019			0,001			0,020		
Household variables												
None	0,00	5%	+	0,02	-10%	-	-0,02	10%	+	-0,01	2%	+
Primary Incomplete	-0,01	-1%	-	-0,03	-4%	-	-0,01	-1%	-	-0,04	-2%	-
Secondary Incomplete	0,00	-1%	-	0,00	-1%	-	-0,03	4%	+	-0,03	2%	+
Secondary Complete	0,02	7%	+	0,05	13%	+	0,04	6%	+	0,09	8%	+
University Incomplete	0,00	-1%	-	0,00	0%	+	0,02	-8%	-	0,02	-5%	-
University Complete	0,01	9%	+	0,01	8%	+	0,01	3%	+	0,02	5%	+
Post Graduated	0,00	2%	+	0,00	2%	+	0,01	6%	+	0,02	4%	+
Age groups												
12-17	-0,02	50%	+	-0,01	19%	+	-0,01	12%	+	-0,02	14%	+
18-24	-0,01	2%	+	-0,05	4%	+	0,01	0%	-	-0,05	1%	+
25-34	0,01	21%	+	0,02	19%	+	-0,02	-14%	-	0,00	-1%	-
35-44	0,01	7%	+	0,02	21%	+	0,01	3%	+	0,03	10%	+
55-64	0,01	-10%	-	0,00	-5%	-	0,00	-3%	-	0,01	-4%	-
65 and older	0,01	-19%	-	0,01	-22%	-	0,00	-7%	-	0,01	-12%	-
Marital status												
Non- married	0,014	10%	+	0,06	27%	+	0,03	10%	+	0,09	16%	+
Widowed	0,001	0%	-	0,00	0%	-	0,00	0%	-	0,00	0%	-
Divorced	0,003	1%	+	0,01	2%	+	0,01	2%	+	0,02	2%	+
Single	-0,011	6%	+	-0,04	14%	+	0,00	1%	+	-0,04	6%	+
Position on the household												
Head of Household	0,01	17%	+	0,03	31%	+	-0,02	-11%	-	0,01	5%	+
Single children	-0,012	-0,1%	-	-0,04	0%	-	-0,01	0%	-	-0,05	0%	-
Married children	0,0002	0,1%	+	0,00	2%	+	0,01	2%	+	0,01	2%	+
Other Relatives	0,0001	0,0%	+	0,01	1%	+	0,01	1%	+	0,01	1%	+
Non Relatives	0,0006	0,4%	+	0,00	0%	+	0,00	0%	+	0,00	0%	+
Household variables												
Another members income	-0,02	6%	+	0,06	-12%	-	-0,62	83%	+	-0,56	42%	+
Children under 7 years	-0,08	-12%	-	-0,14	-13%	-	-0,04	-3%	-	-0,19	-6%	-

Source: Diaz (2004)

On the other hand, female participation rates appear to grow continuously throughout the period, experiencing an exceptional increase of 15.6 percentage points between 1984 and 2001, which was especially marked during the recession. During the analyzed periods, female labor participation variations can be explained mainly by increases in education attainment (48%), increases in the proportion of women as head of household (13%), and changes within the family structure and fertility rates (17% and 2%, respectively), both of which to a certain extent are captured by the smaller proportion of children of less than 7 years in the household. Only the business cycle has differential effects between periods. Indeed, women's decisions to participate in the labor market are different depending on the stage of the business cycle: rising when the economy is weakening, and falling when the economy is strengthening.

Table 3.12: Decomposition Results for Female Labor Force Participation

Variables	87-89/84-86		93-95/84-86		99-01/93-95		99-01/84-86	
	Mean Changes	LFP Changes	Mean Changes	LFP Changes	Mean Changes	LFP Changes	Mean Changes	LFP Changes
Observed	0,020		0,067		0,089		0,156	
House Hold Variables								
None	-0,01	2% +	0,00	-1% -	-0,02	2% +	-0,02	1% +
Primary incomplete	-0,005	-1% -	-0,03	-2% -	-0,01	0% -	-0,04	-1% -
Secondary incomplete	-0,001	-0,1% -	0,00	0% -	-0,05	-3% -	-0,05	-2% -
Secondary complete	0,02	18% +	0,06	30% +	0,05	13% +	0,10	20% +
University incomplete	0,01	3% +	0,01	4% +	0,02	5% +	0,03	4% +
University complete	0,01	18% +	0,02	30% +	0,02	10% +	0,04	18% +
Post university studies	0,00	4% +	0,00	6% +	0,01	9% +	0,02	8% +
Age Groups								
12-17	-0,02	32% +	-0,01	20% +	-0,02	15% +	-0,04	17% +
18-24	-0,02	1% +	-0,06	2% +	-0,01	0% +	-0,06	1% +
25-34	0,01	7% +	0,02	8% +	-0,03	-7% -	-0,01	-1% -
35-44	0,01	6% +	0,03	13% +	0,02	4% +	0,05	7% +
55-64	0,01	-6% -	0,01	-5% -	0,01	-2% -	0,01	-3% -
65 y older	0,00	-5% -	0,01	-11% -	0,01	-5% -	0,02	-7% -
Marital Status								
Unmarried	0,01	3% +	0,05	8% +	0,03	2% +	0,08	4% +
Widowed	0,002	0,2% +	0,00	0% +	0,00	0% +	0,00	0% +
Divorced	0,01	9,0% +	0,02	10% +	0,02	6% +	0,04	8% +
Single	-0,02	-14,1% -	-0,05	-28% -	-0,01	-4% -	-0,06	-13% -
Position								
Head of Household	0,01	10,7% +	0,03	16% +	0,03	11% +	0,06	13% +
Single Children	-0,01	2,2% +	-0,03	4% +	-0,02	1% +	-0,05	2% +
Married Children	0,003	1,2% +	0,00	1% +	0,00	0% +	0,01	1% +
Other Relatives	-0,01	0,4% +	-0,01	0% +	0,01	0% -	0,00	0% +
Non Relatives	-0,001	-0,3% -	0,00	0% -	0,00	0% -	0,00	0% -
Household Variables								
Real income	-0,02	5,1% +	0,06	-11% -	-0,38	40% +	-0,32	22% +
Children under 7 years	-0,08	3,1% +	-0,14	4% +	-0,02	0% +	-0,17	2% +

Source: Diaz (2004)

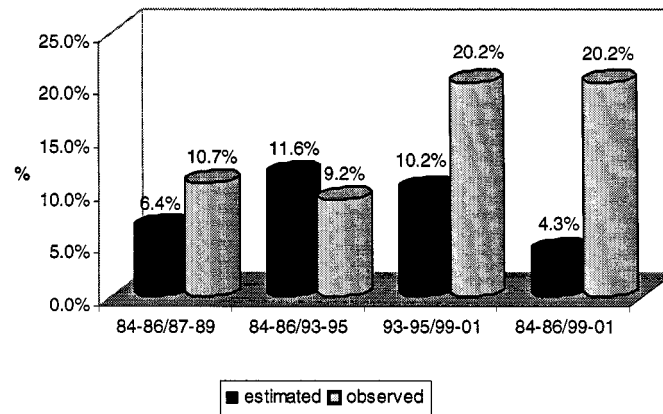
The purpose of what follows is to explore the impact of the increase in participation rates on unemployment, especially in the later years. With that goal in mind, simulations of unemployment levels were obtained using the results of the participation probability determinants⁸, and then generating a corresponding forecast of the unemployment rate, both of which were described above⁹.

⁸ This prediction was calculated using the coefficients of the last period and keeping the means of the different variables constant at the initial levels. These values are introduced in the econometric prediction, considering that the relationship is not linear.

⁹ It is important to stress that the employment rate remained constant in the final level.

Figure 3.21 presents both the observed and the simulated unemployment rate for the entire sample (men and women). The results clearly indicate that changes in labor force participation have a considerable effect on the unemployment rate. For example, the observed unemployment rate for 1987- 1989 was 10.7%, but if the participation had not grown between 84-86 and 87-89, this rate would have been 6.4%. A very interesting result arises when the average unemployment rate of the recession period (1999-2001) is compared to the forecasted rate. The unemployment rate reached its highest level during this period, around 20.1%. However, had the labor participation rate remained at 93-95 levels, unemployment would have been around 10.2%. Furthermore, assuming labor participation was at 84-86 levels, unemployment would have been 4.3% during the crisis.

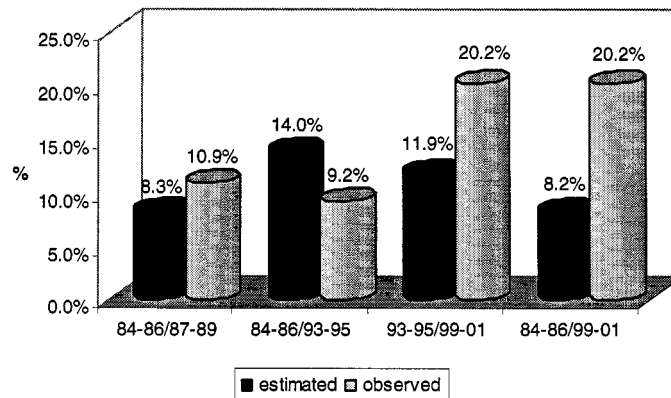
Figure 3.21: Observed and Estimated Unemployment Rate



Source: Diaz (2004)

Figure 3.22 presents results similar to those presented in the figure above, but with the assumption that only female participation changed. The results are conclusive to demonstrate the strong effects of female labor participation on unemployment: if female participation had not grown the 15.6 percentage points mentioned, unemployment would have been 10 % lower in the 1999-2001 period, compared to 1993-1995.

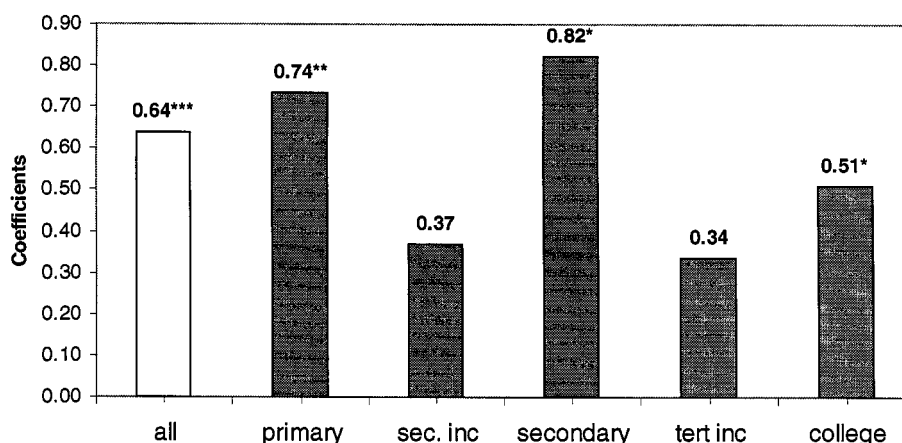
Figure 3.22: Observed and Estimated Unemployment Rate (changes on females LPR)



Source: Diaz (2004)

Additionally, to explore the differences across educational groups, instrumental variables regressions, as described in Box 3.2, were carried out. As the following picture shows, the labor force participation has a strong effect on unemployment across the board, but especially for the least and most skilled, and for those with an intermediate education. It is important to point out that this effect could be higher, because the regressions are affected by the strong correlation between labor force participation and GDP. For example, an increase of 10% of participation among workers with secondary education causes their unemployment rate to increase by 8.2%.

Figure 3.23: Effect of Participation on Unemployment by Educational Groups



Source: Authors' Calculations

To conclude, the factors behind Colombia's high urban unemployment rates following the late 1990s recession were explored with the aim of understanding why unemployment grew so much and why it has been so difficult to bring it back down. The evidence presented strongly indicates that the labor market's inability to adjust was mainly related to four factors: (i) an increasing level of inflexibility of wages, although, as mentioned above, they declined after the recession (both in pesos and in dollars, see Box 3.7) stopping the unemployment rate from continuing to grow; (ii) the evolution of minimum wages; (iii) high and increasing non-wage costs; and (iv) the increase in participation of women in the labor market. Additionally, high wages of employees in the public sector were shown to exert a negative influence, although small, on overall employment rates through their effect on the overall wage distribution.

Evidence presented in the chapter, additionally, indicates that since the last recession unemployment has become more sensitive to changes in output. Even though the cycle affects proportionally more unskilled workers than their skilled counterparts, after the economic recession the latter group appears to have become very sensitive to cyclical changes. Also, despite the fact that the cycle seems to have had a positive effect on labor demand, the chapter's findings indicate that a number of factors triggered the increased difficulty for the labor market to adjust in the mid-1990s, when the sensitivity of wages to the cycle declined importantly. The evidence presented suggests that minimum wages were a key factor behind this, as they prompted increases in the average wage of the

entire working population, which may help explain the labor market's inability to adjust despite improvements in economic growth during the early 2000s. The ratio between the minimum and average wage levels increased significantly in the late 1990s and, thus, the proportion of people earning less than the minimum wage rose as well.

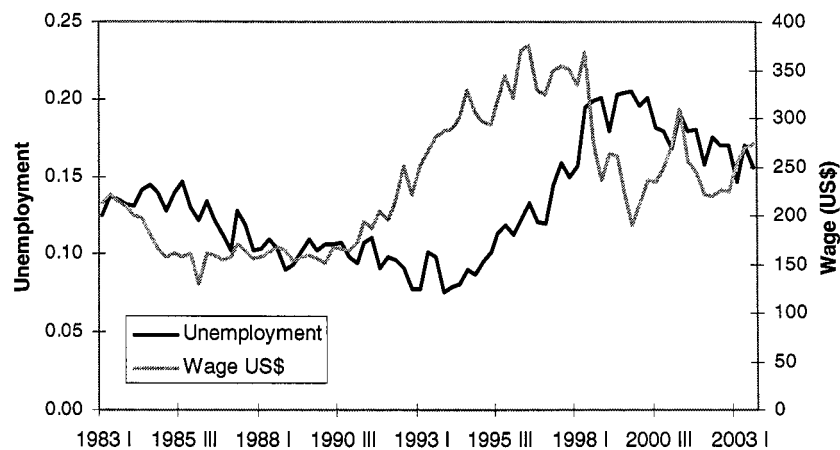
In addition, results presented in the chapter show that public sector wages, which continued to grow even during the recession years despite being considerably higher than any other employment type, and the increase in non-wage costs triggered by the implementation of the social security reform, also had a significantly negative effect on total employment. These negative effects were compounded by important changes in the supply of labor and increases in labor force participation, particularly the fast growth of female participation, which further exacerbated the labor market adjustment problem.

Box 3.8: Output Shocks and Labor Market Adjustments, a comparison between Argentina, Colombia, and Mexico: after inflation stabilization programs were implemented in Latin America during the 1990s, South American labor markets became more prone to adjust to real shocks through employment levels rather than wages (González-Anaya, 1999). This was certainly the case in Argentina, where the hard-peg-based Convertibility Plan, which relied on the exchange rate as a major policy instrument and an anchor for inflation expectations, was implemented in 1991. During the convertibility period, adjustments to the real exchange rate could only occur through deflation of nominal wages and prices, because the nominal exchange rate could not be adjusted and inflation could not be used to reduce real wages. When the country's recession moved into an escalating crisis in the late 1990s, nominal wages did not fall, and instead, labor market adjusted through increasing unemployment levels. Between 1998 and 2001, unemployment jumped from 13% to 18%, peaking at 22% in 2002 after the debacle of the convertibility plan and the massive exchange rate devaluation that came with it in January of that year. This sharp increase in unemployment hit the formal sector very hard, which had not been heavily affected by prior unemployment episodes, but accounted for almost 90% of the jobs lost at the height of the crisis. With a resumption of inflation in the post-convertibility period of 2002, real wages seemed to have increasingly absorbed the adjustment and helped to ease the impact of the crisis on the employment level, as evidenced by the fact that, despite an 11% output contraction in 2002, employment only fell 1.1% that year (the Poverty Assessment estimates that if the impact of the *Plan Jefes & Jefas* is considered, employment would have fallen by 3.6%, which still is relatively small). Real and nominal wages for formal sector employees, which were the most stable between 1995 and 2001, suffered a dramatic contraction in 2002. Informal workers' nominal and real wages were more flexible throughout the period, though this flexibility was not sufficient to restore full employment. Real labor costs in the private sector also fell, and by mid-2002 they were 30% lower than at the peak of the crisis. All of this seems to indicate that, while during the earlier phase of the crisis, the labor market adjusted mainly through unemployment levels, once the devaluation took place, wages and other labor costs became the main adjustment mechanism, triggering a deceleration of unemployment growth towards the end of 2002.

Mexico poses a very different case, as a distinctive characteristic of this country's labor market during the 1990s was the wage response to changes in economic activity, which worked as a shock absorber in times of recessions and helped to cushion the effect of recessions on employment. Indeed, the country's swift and strong recovery from the large slump suffered in 1995 as a consequence of the Tequila crisis was largely attributed to Mexico's flexible wages, which absorbed an important part of the adjustment after the crisis. Mexico's unemployment rate during this decade was surprisingly low, especially when compared to those observed in other Latin American countries, including Colombia and Argentina, which experienced similar episodes of growth. Despite constant increases in labor participation, Mexico's unemployment rate never reached a two-digit figure during the 1990s, and, with the exception of the Tequila crisis in 1995, it was never above 5%. But even during the recession, the unemployment rate was remarkably low, not surpassing 6% in the years after the Tequila crisis, in clear contrast with Argentina and Colombia, which registered unemployment rates above 20% during their recession episodes. Low levels of unemployment came at the cost of the stagnation of remunerations in real terms, with 2003 average wages around pre-1995 levels. The

average trend masks significant differences in wage level by skill level, but a closer look at the evolution of wages shows that in 2003 skilled workers' wages were 25% higher than 1987, while those of non-skilled workers were around 1987 levels. Recent evidence suggests that the ability of Mexican labor markets to adjust to economic shocks through wages may have been declining since the late 1990s and, in line with the rest of the continent, Mexico's labor markets may be increasingly absorbing output fluctuations through employment levels (see Bendini, Gracia, and Santamaría, 2004).

Colombia's labor market adjustment to the crisis of the late 1990s seems very similar to that of Argentina's. The high level of inflexibility of the Colombian labor market, combined with increasing labor force participation lead to a jump in unemployment that reached 20% of the active population in 2000. The formal and informal sectors adjusted to the contraction in output in very different ways, though. Due to wage rigidities caused by a very high minimum wage, high wage and non-wage costs, the formal wage sector had to resort to cutting jobs on an enormous scale. The self-employed, on the other hand, did not register such large increases in unemployment, but actually increased their job share, absorbing a third of previously wage-earning households. However, they did face considerable reductions in earnings of up to 20%, in clear contrast with salaried workers who, despite labor demand reductions, actually saw their wages rise by 3.7%. Some additional adjustment in wages was obtained through reduction in the wage gender gap (in both labor markets) and higher female participation (World Bank, 2002). As in the case of Argentina, the devaluation of the Colombian peso prompted a deceleration of unemployment growth, which has remained constant (though at very high levels) since 2002 despite improvement in economic growth during the early 2000s. The evolution of unemployment and real wages in dollars in the figure below suggests that after the devaluation, wages absorbed a larger share of the adjustment, which prevented unemployment levels from continuing to increase.



Source: ENH- DANE-Banco de La República

4. SELF-EMPLOYMENT, INFORMALITY AND CYCLICAL ASPECTS OF THE COLOMBIAN LABOR MARKET

SUMMARY

This chapter studies the evolution of salaried employment, self-employment and informality to assess the extent to which rigidities are distorting individual decisions related to the occupational choice. The important thing to evaluate is whether this choice is being forced by the rigidities and worker's welfare is being negatively affected. Also, the chapter explores the issue of who are the workers that suffer the most during downturns of the cycle. The main messages can be stated as follows: (i) the composition of the urban labor market became more self-employed oriented. The important things about this move are that these new self-employment jobs appear to be of low quality; and that the labor market shifted toward a higher level of segmentation in the period 1995-2002. That is, self-employment now seems to be increasingly populated by individuals that would prefer to be in a salaried job but cannot find one; (ii) the labor market has a stable share of informal salaried employment, despite an important increase during the 1990s. Indeed, the share of informal salaried workers remained stable at around 35%, after reaching a peak of 40% in 1998; (iii) minimum wages and non-wage costs appeared as key determinants of self-employment, informality and segmentation. Their effect became particularly pervasive since 1998 for minimum wages and 1995 for non-wage costs. Non-wage costs appear to have a more significant impact; and (iv) women of all ages, teenagers of both genders and the unskilled are the groups that suffer the most during contractions of aggregate economic activity and, despite their lower share of the population, are the groups that cause the larger movements of the overall unemployment rate.

The main objectives of this section are to understand as much as possible (i) the evolution and determinants of self-employment in urban Colombia, and to a lesser extent those of informality (to a lesser extent because of lack of enough data observations); and (ii) to shed light, using a rigorous methodology, on the issue of how are different groups of workers affected by the business cycle. These two aspects have potent implications for the design of public policies related to the labor market and, more broadly, for the design of effective social security and social protection systems.

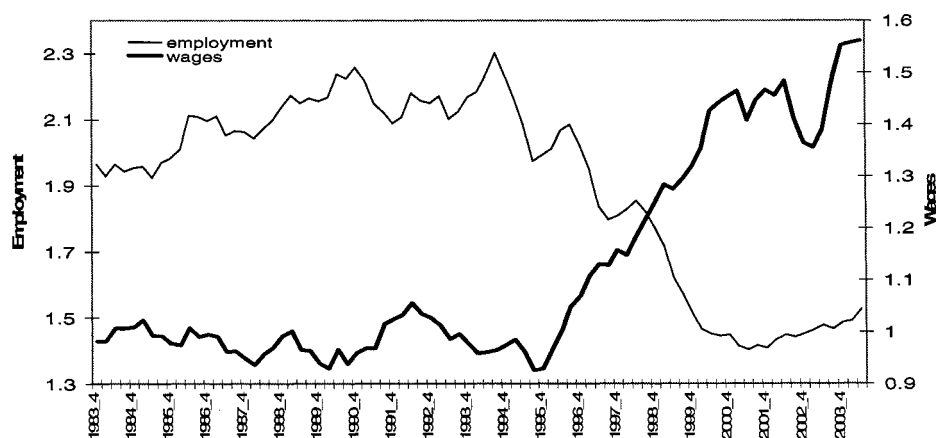
- Self-Employment, Salaried Employment and Informality¹⁰

As demonstrated in Fiess, Fugazza and Maloney (FFM, 2002), for example, the evolution of relative sector sizes (relative between salaried employment and self-employment) and relative wages can give important clues about the nature of the rigidities affecting the labor market and the way it responds to those rigidities. In particular, those authors show that unless there are nominal rigidities affecting the labor market (for example, minimum wages or high and inflexible non-wage costs), both series should move in the same direction over time. In this case, the existence of a self-employment sector is viewed as

¹⁰ This section uses mostly a partition of the labor market among three groups of workers: formal salaried (FS), informal salaried (IS) and self-employed (SE)

largely consisting of small-entrepreneurs who choose that occupation as a rational decision, possibly because of misalignment of social security benefits and contributions, high costs of registration (i.e. of being formal) or for personal reasons (such as the desire to be one's own boss, not having to comply to schedules, etc). In any case, the important thing is that rational individuals find a bundle in self-employment that is deemed as providing higher satisfaction than that found in salaried employment. Also, it points to the fact that productivity growth is low, making the opportunity cost of formality small. In the reverse case, (i.e. when the series move in opposite directions), some nominal rigidity is binding and affects the labor market by rationing out some workers from salaried employment, even though they would prefer to be there if given the choice. In this case, the more traditional hypothesis of segmentation could be thought to be in place and self-employment would be seen (at least part of it) as an undesirable outcome. This distinction is important because, among other reasons, the policy implications for the design of social security and insurance systems may vary substantially from one scenario to the other. Additionally, it sheds light on the appropriateness of several important labor market related regulations, notably non-wage costs and minimum wages. Figure 4.1 plots relative sector sizes and relative wages in urban Colombia for the period 1983-2004 (4 quarter moving averages).

Figure 4.1: Evolution of Relative Sector Sizes and Wages (salaried/self), 1984-2004



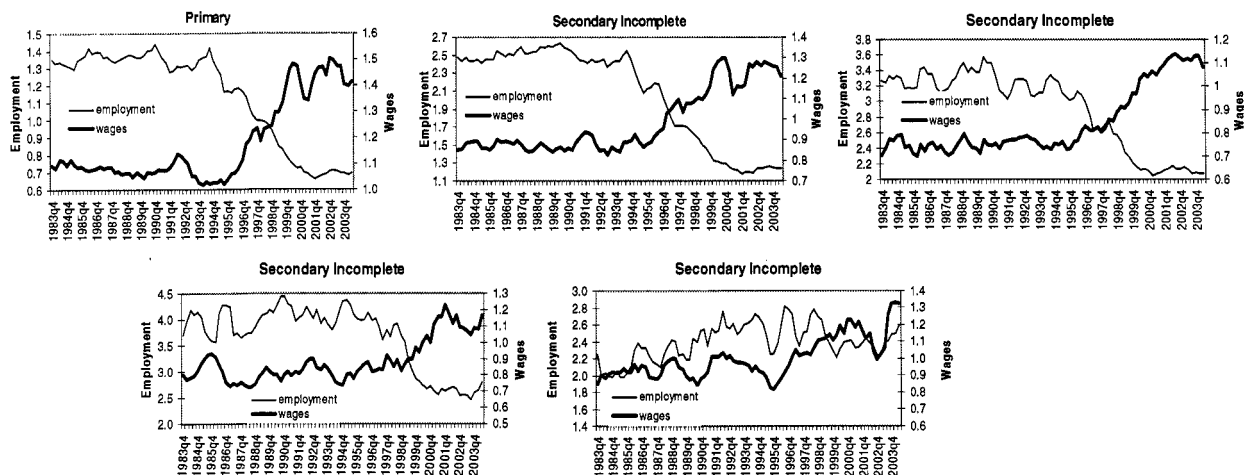
Source: ENH- DANE

One thing is very clear from the graph. After 1994 and until at least 2001/02, the series move in opposite directions, indicating that after this date some factor began to have an important impact on the labor market (i.e. some rigidity was introduced and it implied more segmentation in the labor market). It is important to note at this point that it was precisely then that the reform to the social security system (health and pensions, Ley 100 de 1993), which substantially raised contributions, went into effect (see annex 1 for the timetable and content of the reforms). Also, note that the decline of relative sector sizes is steeper during the recession, and that relative sector wages never declined in that period, reinforcing the point made in the previous section related to the inflexibility of formal wages to decrease. In the previous period (1983-1994) the trends are not very clear, except maybe for the period 1991-94, in which both series appear to co-move, indicating that in those years, which correspond to an expansionary period, the labor market

displayed signs of not behaving in a segmented fashion. In the earlier years there seems to be a weak opposite movement that, in any case, is too weak to be able to extract conclusions. Figure 4.2, below, replicates figure 4.1 for the same five educational categories that have been used throughout the report (primary, secondary incomplete, secondary complete, tertiary complete and college).

Four points are worth mentioning. First, for all but the college group, there is a sharp change in the way both series behave at the same point in time, which coincides with the general case shown in figure 4.1 (1994). It seems that this change is largest for the two lowest groups, implying that workers with the lowest skills were the most affected by this move towards more segmentation. That is, they appear to have been rationed out from salaried employment in a larger proportion than the other groups (the changes in relative wages are also greater for them). Second, in all groups (including college) relative wages increased substantially over the period, indicating that salaried wages grew more than those of self-employment. This growth, however, starts later for the most educated group (1997) than for the rest (1994). This points to the fact that the erosion of self-employment wages for the most educated only started when the recession hit, while for the rest of salaried workers this happened since 1994, probably due to increased flows of individuals from salaried to self-employment. On the other hand, the increase in relative wages is largest among the two groups with the least education. Third, during the pre-1994 period there seems to be non-segmentation among the lowest and two highest education groups, for which both series co-move. For the other two groups, the situation is not clear. This is a somewhat surprising result that will be explored in more detail below. Finally, for the college group, despite an important increase in relative wages since 1997, there is no evidence of segmentation in any sub-period, as both series move very closely all along. To corroborate this “informal” evidence, an econometric analysis of the properties of the time series of relative sizes and wage was carried out, and is reported next.

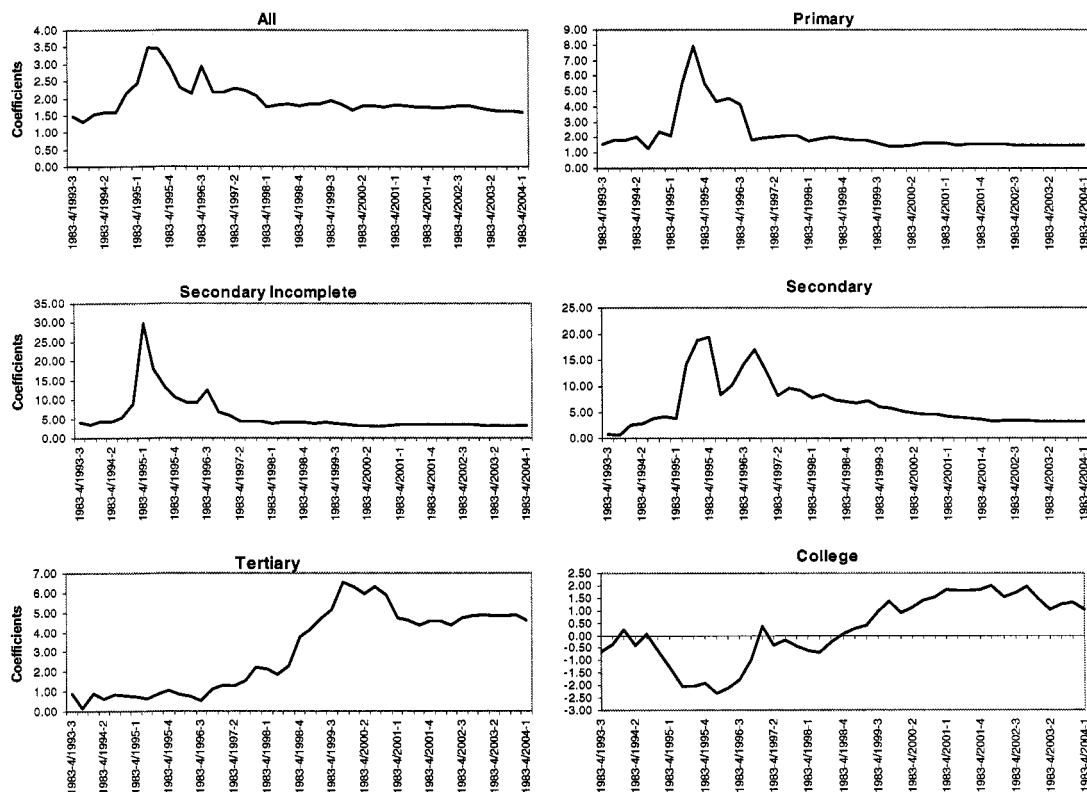
Figures 4.2: Evolution of Relative Sector Sizes and Wages for Skill Levels, 1983-2004



Source: ENH- DANE

As argued in FFM, it is highly plausible that the series of relative sizes and wages are cointegrated, which is just a way of saying that there may be a long-term structural relationship between the two series that could give important clues about the nature of the labor market and the rigidities that affect it. In particular, a negative cointegration relationship constitutes evidence of segmentation in the labor market, in the sense discussed above: relative sector sizes and wages move in opposite directions over time, indicating that many of the self-employed are in that sector because of lack of opportunities in the salaried sector (i.e. they have been “rationed-out” from salaried employment due to nominal rigidities or poor economic performance). In this report the cointegration relationship is estimated for the entire period, and also for sub-periods of the sample to study how it changed over time. Specifically, the estimation starts with a base period of 40 quarters (4/83-3/93) and one quarter is added iteratively until the end of the data is reached. This allows the identification of how the long term (structural) relationship between the two series (or the extent of segmentation) changed over time¹¹. For a description of the cointegration methodology see Box 3.2 in the previous section. For now, it is important to keep in mind that a positive coefficient means a negative relationship and vice versa. Figure 4.3 shows the results from this exercise for the whole sample and each skill group.

Figures 4.3: Segmentation in the Labor Market: Cointegration Results, 1983-2004



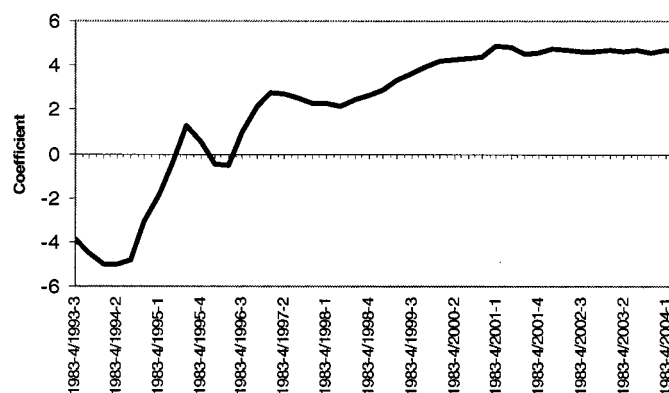
Source: Authors' Calculations

¹¹ The cointegration model also includes the exchange rate, as the theoretical model posited by FFM is for those three variables, which means that the empirical derivations hold for the entire set of variables.

It is striking from the figures that for all the lower levels of education (through secondary), and for the whole sample there is an important jump in the relationship that occurs around 1995/6, coinciding with the social security reform going into full effect, and then the coefficients seem to stabilize, at high levels, until the end of the period. Among these groups, the size of the coefficient is largest for those with complete or incomplete secondary education. For the two groups with highest education levels, on the other hand, the situation is different. Before the 1998, not only is the cointegration relationship positive for the highest group (indicating a non-segmented labor market), but it is not statistically significant for the college dropouts. After 1998, however, the coefficients become positive (negative relationship) and significant for both groups, indicating a forceful move toward segmentation. The size of the coefficient is larger among the dropouts. It is important to note that this timing coincides with the deepening of the recession, possibly suggesting an important rationing of skilled workers during this period due to sluggish demand, fact that is consistent with the unemployment figures.

Thus, combining the results obtained by looking at the evolution of relative sector sizes and wages with the cointegration estimations, three key things can be concluded: (i) the Colombian labor market became more segmented (in fact, it appears that segmentation became the dominant feature) since 1995/6. This fact is consistent in timing with the full enforcement of the social security reform enacted at the end of 1993, a fact that makes it possible that there is actually a causal relationship between these two events; (ii) the recession also played a role in this shift by restricting labor demand. The cointegration results indicate that this effect was especially important among the most skilled segments of the population; and (iii) given the magnitude of the shift, it is likely that there are other factors, besides the social security reform and the recession, which fostered segmentation. Some additional exercises were performed to test the validity of these hypotheses. First, cointegration tests were carried out between the series of relative sector sizes and non-wage costs, minimum wages, GDP and labor force participation rates. It turned out that relative sector sizes were only cointegrated with non-wage costs, confirming the chief role that this variable has played in shaping a more exclusive labor market. Figure 4.4, below, plots the cointegration coefficients between the series of relative sector sizes and non-wage costs, using the same methodology of figure 4.3.

Figure 4.4: Long-Run Relationship between Sector Sizes and Non-Wage Costs, 1984-2004



Source: Author's Calculations

The graph is quite clear in confirming the hypotheses that starting in 1995 the size of the salaried sector is negatively affected by non-wage costs. In fact, it appears that the increase of social security contributions exerts a negative influence on salaried employment since 1996, and that the magnitude of this “influence” increased as the recession unfolded (1998-2000) to stabilize at the end of the period. This last fact (that the size of the effect increases in 1998-2000) appears not only here, but in practically all the figures analyzed throughout this section. It may be indicating, thus, that, besides the recession, some other factor may be at play here. In particular and as discussed in the previous section, the real minimum wage increased substantially since 1998. The effects of such an increase do not have to be reflected only in unemployment: they can act as an additional factor contributing to ration-out workers from private salaried employment. Thus, regression analyses were used to check this hypothesis. Additionally, these regressions allow the identification of other factors that are highly correlated with the sizes of the salaried and self-employment sectors¹². The results obtained with the different estimation methodologies were very consistent and, in general, confirmed the hypotheses presented above. Table 4.1, for example, shows the coefficients for the two most important variables (GDP cycle and the growth of the minimum wage) for the whole sample and for each educational group.

Table 4.1: The Economic Cycle, Minimum Wage and Segmentation in the Labor Market

	Entire Sample	Primary	Secondary Incomplete	Secondary Complete	Tertiary Incomplete	College
GDP Cycle*	0.798 (2.15)*	0.389 (1.85)*	0.378 (0.83)	1.028 (1.42)	2.019 (2.3)*	1.396 (2.39)*
Minimum Wages	-0.523 (-2.55)*	-0.152 (-1.3)	-0.691 (-2.41)*	-0.842 (-2)*	-0.875 (-1.45)	-0.405 (-0.73)

Source: Authors' calculations

* Significant at least at 10%

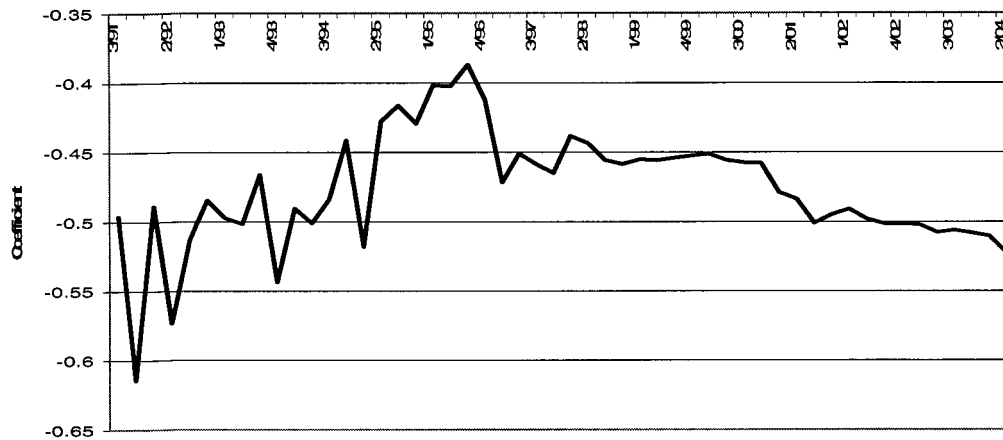
+ The GDP cycle is obtained using the Hodrick-Prescott filter with four lags

Notes: (i) positive coefficients mean that the variable is positively correlated to the ratio of salaried employment to self-employment, controlling for other observable factors. For example a rise of one point of the GDP cycle is associated with an increase of 0.8 points of such a ratio; and (ii) t values are in parentheses.

Indeed, the cycle is significant only for those workers with primary education or for the ones with some or completed college (and for the whole sample). For the latter the coefficient is much higher than for those with low education levels. The minimum wage has an important and statistically significant negative impact on salaried employment, as hypothesized above (that is, it fosters self-employment). Note, however, that the two groups with the highest education levels do not appear to be affected by it. To test how the impact of the minimum wage has evolved over time, the same equation was estimated starting with a base period of eight years (32 quarters), and then adding sequentially one quarter until the end of the data. Results are shown in Figure 4.5.

¹² The methodologies used were OLS, instrumental variables (instrumenting the participation rate) and, in some cases, VAR (vector auto-regression) models. All were run in first differences, as most of the variables were found to be integrated of order one. The variables included are the GDP cycle, the minimum wage, participation, firing costs, the average wage prevailing in the private salaried sector and seasonal controls. The dependent variable is the ratio of private salaried employment and self-employment.

Figure 4.5: Impact of the Minimum Wage on the Degree of Segmentation in the Labor Market (8-year rolling coefficients)



Source: Author's Calculations

It is apparent in the figure that minimum wages have become a more binding constraint affecting the decision of whether to become a salaried worker or self-employed. In particular, since 1996/7 the estimated coefficient (in absolute value) increased by more than 30%, indicating that the combination of a large increase of the minimum wage in real terms and the recession was disastrous for salaried employment generation. Finally, the rest of the variables included in the regression (footnote six) turned out to be non-significant, with the exception of firing costs that were significant in some specifications, but only for the intermediate skill groups (secondary complete and tertiary incomplete). This would appear to indicate that the decision of whether to become a salaried worker or self-employment basically depends on the relative wages between the two sectors, the amount of payroll taxes (which affects both the decision and the demand for salaried employment), the minimum wage and the state of the economy¹³.

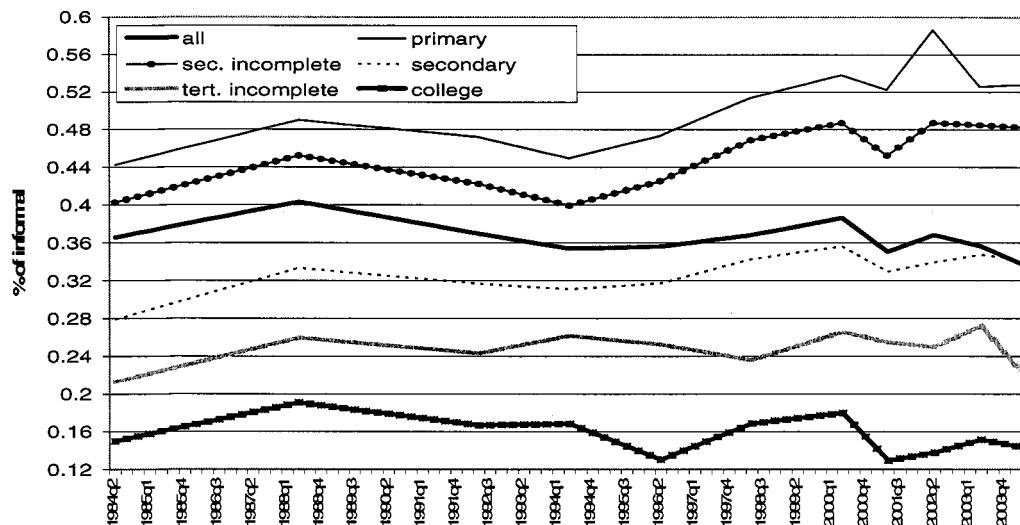
Now, attention turns to the evolution of informal salaried employment, defined to be composed of workers that work in small firms (less than 10 employees), that do not have legal contracts and are not affiliated to social security, which corresponds to the ILO definition¹⁴. Unfortunately, there are not enough data observations to carry out econometric analyses. Thus, some descriptive stylized facts will be presented here to shed some light on the issue of informal salaried employment¹⁵. Figure 4.6 shows the evolution of private salaried informal employment for the five skill groups used throughout the report, and for the whole sample of workers.

¹³ The exchange rate was also found to be cointegrated to the series of relative sector sizes and wages, indicating that this variable is important for the evolution of relative sector sizes. In particular, the big devaluation of the period 1998-02 seems to have contributed to the expansion of the self-employed sector, which, mostly, is concentrated in the production of non-tradeables.

¹⁴ Using alternative definitions, such as being affiliated to health or old age insurance produces the same conclusions.

¹⁵ Data on informality was only captured in the second quarter of 1984, 88, 92, 94, 96, 98, 2000, 01, 02, 03 and 04, making for eleven observations.

Figure 4.6: Private Informal Salaried Employment by Skill Level, 1984-2004



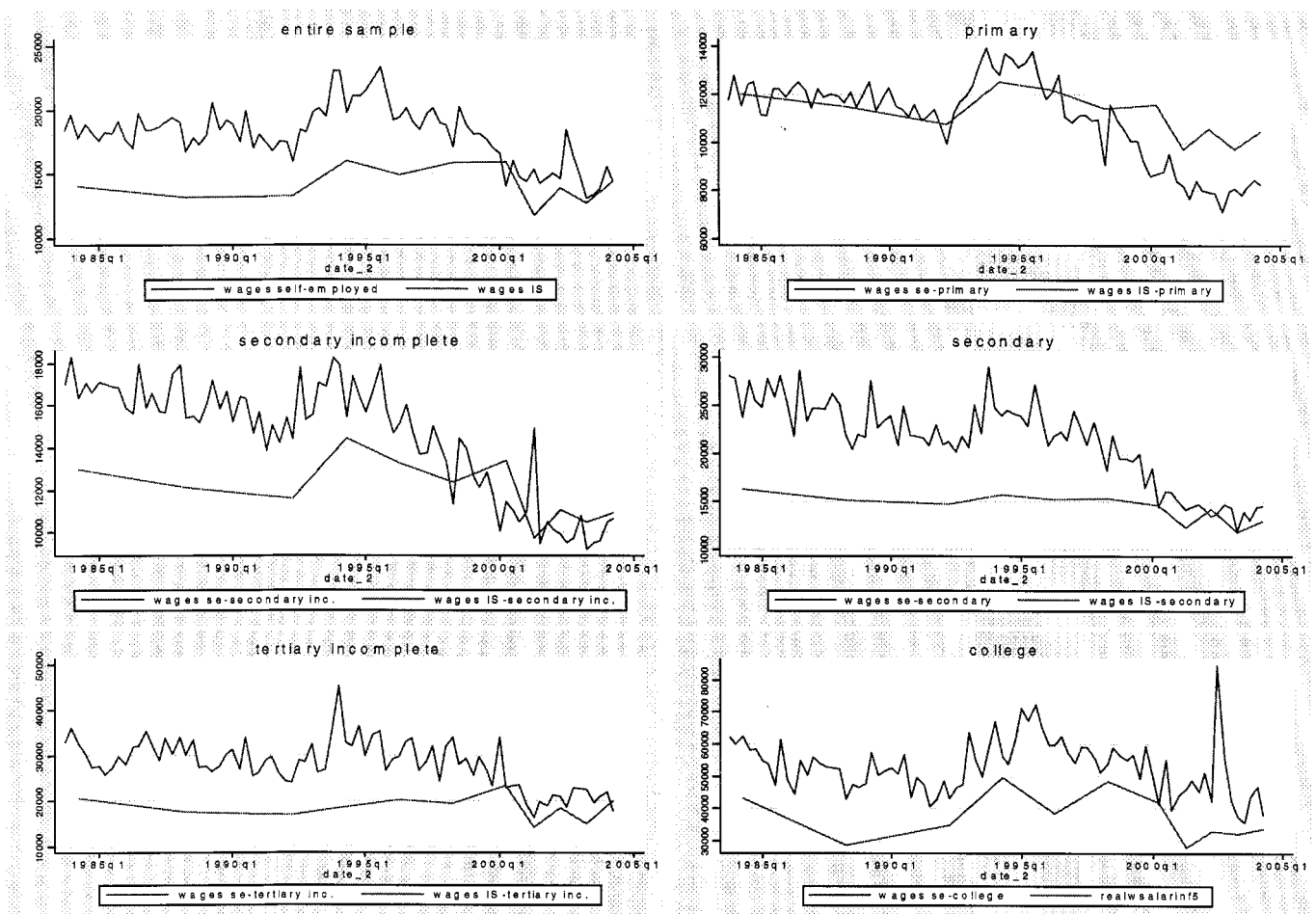
Source: ENH- DANE

The graph shows four important facts: (i) as expected, informality is higher for the lowest skill levels and the differences between the lowest and highest groups widened over the period. For example, in the lowest skill group the percentage of informal workers was around 44% in 1984 and 53% in 2004, while the same figures for the highest skill group were 15% in both years; (ii) in most of the groups there is an important decline in informality at the end of the period (since 2003). These declines appear to be especially large for the least skilled groups; (iii) the evolution of informality during the period 1994-2000 is different for the various groups, whereas it was quite similar in the previous years. Indeed, the period 1994-2000 was characterized by a very sharp increase in informal employment in the three lower groups, whereas the highest two displayed an increase only in the period 1996-2000. In the lowest group, informality increased from 45 to 53%, while in the second group (secondary incomplete) the rise was from 40 to 49%. The intermediate group (high school) experienced a rise of six percentage points (from 30 to 36%). In the two most skilled groups, on the other hand, the growth was lower and occurred later. For those with incomplete and complete tertiary education the share of informal workers rose from 23 and 13% to 27 and 17%, respectively. This translated into the overall informality rate increasing from 34 to 39% during the period 1994-2000 (as a percentage of total salaried employment); and (iv) informality among the highest skill levels was stable if the beginning and the end of the entire period are compared.

In order to extract more robust conclusions and especially, to capture differences between self-employment and informal employment, an additional exercise was performed. Regressions to model the choice of sectors in two years (1994 and 2004) were run (salaried vs. self-employed, and informal salaried vs. formal salaried) correcting for selection bias related to participation in the labor market. This allows a (conditional) comparison of factors, from those captured in traditional labor force surveys, to determine what most affects the “choice” of occupation. That is, at the end interest lies in finding out what makes self-employment different from informal salaried employment.

Before presenting the results, it is informative to compare the evolution of real wages between the two sectors. Figure 4.7 plots real wages for the self-employed and for salaried informal workers for the entire sample and for each educational group. The conclusions from these graphs are evident. First, for the entire sample and for all educational categories but the lowest, average wages of the SE were significantly higher than those of the IS until 1999. This conforms to expectations because the IS are perceived as the most disadvantaged set of workers (they have neither the perks of salaried workers, nor the benefits of self-employment). However, after 1999 differences disappeared, pointing again to the shift towards a more segmented labor market. Second, the drop in IS wages during the recession was not as severe as the one in SE, possibly indicating that all wages in the salaried sector are subject to rigidities. Third, among the least educated there are no differences in wages between the two sectors. If anything, informal salaried workers have been better off than the self-employed since 1999. This constitutes convincing evidence that self-employment among the least skilled workers seems to be of an almost purely segmented nature. Fourth, wage trends between the two sectors are almost identical, especially before 1999, which is somewhat surprising. The real difference corresponds with the period 1995-2000, when wages in SE fall much more (and for a longer period) than those for the IS.

Figures 4.7: Real Wages for IS and SE, 1984-2004



Attention now turns to the econometric exercise described in the previous paragraph, whose results are shown in Table 4.2. First and most importantly, the coefficients related to the age groups indicate that in 1994 workers in self-employment conformed with a pattern in which people move to self-employment when they have accumulated work experience and (possibly) capital to start a business. In effect, the table reveals that the younger groups were less likely to be self-employed while those between 30 and 49 years of age displayed the highest likelihood (especially those in the 40-49 range). However, in 2004 there were no differences among the various age groups (no coefficient is statistically significant), pointing once again to a severe deterioration of this activity. Looking at the IS sector, on the other hand, it is clear that, in both years, younger workers were the ones with a higher likelihood of being IS, indicating that this occupation may be regarded as a good entry point into the labor market for young workers who want to acquire experience. Note, however, that by 2004 the differences across age groups had become more marked. This seems to indicate that it became more difficult for young workers to find formal salaried employment during the recession.

Table 4.2: Factors that Impact Employment in the SE and IS Sectors: What is Different Between Them?

Variable	1994		2004	
	SE	IS	SE	IS
occupation rate hh	0.32	0.69	0.41	-0.77
secondary incomplete*	-0.11	-0.09	-0.13	-0.04
secondary*	-0.23	-0.29	-0.42	-0.18
tertiary incomplete*	-0.29	-0.37	-0.70	-0.43
college*	-0.20	-0.79	-0.80	-0.30
18-24**	0.10	-0.29	-0.02	-1.15
25-29**	0.38	-0.37	0.04	-1.15
30-39**	0.50	-0.40	0.14	-1.51
40-49**	0.55	-0.19	0.23	-1.61
50-64**	0.46	-0.23	0.17	-1.72
65+**	0.02	-0.03	-0.05	-2.33
age squared	0.00	0.00	0.00	0.00
female	-0.11	-0.17	-0.09	-0.02
spouse***	0.14	0.17	0.02	0.31
single sons & daughters***	0.07	0.33	-0.09	-0.36
non-single sons & daughters***	0.00	0.33	0.04	-0.07
other kin***	-0.02	0.27	-0.09	-0.18
non-kin***	-0.25	0.25	-0.15	0.03
children under 7 in hh	0.04	0.10	0.03	-0.11
married****	-0.09	-0.05	-0.23	-0.11
widower****	0.01	0.35	0.10	0.02
divorced****	-0.03	0.16	0.02	0.15
single****	-0.11	0.15	-0.05	0.31
presence of FS in hh	-1.13	-7.92	-0.85	7.98
presence of public workers in hh	0.00	-0.10	0.01	0.11
Bucaramanga*****	-0.14	0.47	-0.19	0.03
Bogotá*****	-0.19	0.29	-0.50	-0.12
Manizales*****	-0.36	0.06	-0.31	0.12
Medellín*****	-0.39	0.13	-0.50	0.01
Cali*****	-0.13	0.16	-0.43	0.03
Pasto*****	-0.03	0.23	0.03	0.43
not enrolled	0.26	0.17	0.31	0.13

* Compared to primary
** Compared to 12-17
*** Compared to the head
**** Compared to consensual union
***** Compared to Barranquilla
Note: shaded cells correspond to non-significant coefficients

Source: Authors' calculations

The second message is related to education. In particular, while in 1994 the most likely to be found in SE were the unskilled (primary and secondary incomplete) and the most skilled (college), by 2004 the situation changed to one in which a negative (monotonic) relationship between education and self-employment was observed. That is, in 2004 the

most likely to be found in SE were the least skilled, whereas the least likely (with a large difference) were the most educated, with the size of the coefficient increasing as one moves up in the skill distribution. In the IS occupation, on the other hand, the relationship was very much like the one just described for SE in 2004 (i.e. decreasing informality as skills rise). Again, these facts clearly point to a deterioration of SE, turning it into an occupation very similar to IS employment.

The third message relates to the presence of formal salaried and public workers in the household. It has been argued in the literature that one of the motivations for people to become SE arises when other members of a household are formal workers, allowing remaining household members more job flexibility. That is, since the basic needs in terms of social security are already met, other members of the household may complement the income by engaging in SE related activities, without the need to be insured. Thus, if this were true, it should be observed that the presence of formal or public workers in the household increased the probability of being self-employed. However, the data for Colombia are not consistent with this hypothesis. As can be seen in the table, the presence of FS in the household is (strongly) associated with a lower probability of being SE in both years, which may reflect the fact that the “good jobs” tend to be concentrated in certain groups of people (or households). What is surprising, however, is the strong and large positive coefficient found for the presence of FS and the likelihood of being an IS worker in the year 2004 (note, also, that it switched signs between the two years). This indicates that currently, when there are FS workers in a household, there is a large increase in the probability that other members are IS. This may be related to the squeeze suffered by the formal salaried sector during the recession years and to the increased participation of women and teenagers in the labor market (both of whom are more likely to be IS than men and older workers). The presence of public workers in the household, on the other hand, does not seem at all related to the probabilities of being SE or IS.

The final important message from the table is related to the number of children under seven in the household, which appears to increase the probability of being SE and decrease that of being IS. This, again, is related to the division of labor within the household and may also be linked to the increased flexibility of the SE occupation, which complements very well the chores related to taking care of a child. This assertion is confirmed by additional regressions, run separately for men and women, which show that this coefficient is not statistically significant for the former.

Therefore, it can be concluded from this entire sub-section that, indeed, the urban labor market in Colombia became more segmented from 1995/6 and that this process probably ended, or at least lost momentum, around 2002. In this context, self-employment became less desirable and, in fact, became very similar to informal salaried employment in terms of both the characteristics of the workers and the wage levels and trends. The factors that lie behind this shift can be traced back to the increase of payroll taxes resulting from the 1993 social security reform, the behavior of the minimum wage, the deterioration of labor demand due to the recession and, to a lesser extent, the behavior of the exchange rate in the period 1994-2001.

- Some Important Cyclical Aspects of the Colombian Urban Labor Market

It has been said several times that the economic cycle has a powerful influence on the labor market. However, there is no clarity about how this impact is distributed on the population, information which is essential for the design of appropriate policies, either in the labor market itself or, more broadly, social protection related. Thus, the purpose of this sub-section is precisely to investigate this question using a rigorous methodology. This methodology is based on simple decompositions of basic labor market relationships (definitions) that allow the assessment of how each demographic group responds in terms of employment and participation to movements of the business cycle. It was first proposed by Clark and Summers (1981) and it is explained in some detail in Box 4.1.

The estimates of these responses are presented in Table 4.3 for age and gender sub-groups of the population. They reveal substantial heterogeneity across age groups within gender, as well as across gender within any given age group. Cyclical decreases/increases in aggregate economic activity (proxied by the unemployment rate of prime aged men- UAR) appear to be associated with dramatic changes in the gender composition of employment. Lower aggregate demand is associated with a decline in the proportion of males employed in most age categories and an increase in the proportion of women employed. For example, an increase in the UAR of 1 percentage point leads to a 1.3 percentage points increase in the proportion of 45-54 year old women employed. The most important source of this change is the increased participation of women as a consequence of the decline in aggregate demand. The sensitivity of labor participation for women between 35 and 44 years of age is 1.6 points, which is greater than the estimated change in employment, suggesting that the entry of women into the labor force also contributes to the increase in the overall rate of unemployment. Note, also, that this is true for most of the age groups within women, which constitutes a key message: all groups of women substantially increase their participation rate when economic activity slows down (this rise being especially large among younger and older women), but in every case their unemployment rate increases (i.e. many of them go into unemployment). This last fact is shown by the negative sign of the employment rate.

Box 4.1: Responses to Cyclical Variations of GDP: the employment to population ratio (E/N) for age and gender group g can be decomposed into the product of the employment rate (E/L) of group g and the labor force participation rate (L/N). Specifically,

$$\left(\frac{E}{N}\right)^g \equiv \left(\frac{E}{L}\right)^g \left(\frac{L}{N}\right)^g \quad (1)$$

After transforming logarithmically and taking the total differential of both sides of identity (1)

$$d \ln \left(\frac{E}{N}\right)^g = d \ln \left(\frac{E}{L}\right)^g + d \ln \left(\frac{L}{N}\right)^g \quad (2)$$

or,

$$d \ln \left(\frac{E}{N}\right)^g = d \ln(1 - UR)^g + d \ln \left(\frac{L}{N}\right)^g \quad (3)$$

where UR denotes the unemployment rate of the demographic group g .

The objective is to separately examine, for each group, the sensitivity of the two terms on the right hand side of equation (3) to fluctuations of GDP. The sensitivity of the employment to population ratio to changes in aggregate demand is likely to differ significantly across groups. Identity (3) reveals that the net effect of cyclical fluctuations in aggregate demand on the employment to population ratio is determined by how the cyclical sensitivity of the employment rate and labor participation rate varies across groups. As long as certain age and gender groups of workers are more likely to enter the labor force or to be laid-off, or to have a higher tendency to quit over the business cycle, then there are likely to be differences in the extent to which the employment to population ratio varies. In order to examine the cyclical sensitivity of employment and labor force participation, the analysis follows Clark and Summers (1981) and estimates separate regressions using as explanatory variables the current and various lags of the unemployment rate for prime age men (UAR), a trend (T) and trend squared, and three indicator variables for the quarter in calendar year (Q_i). Thus, the equations estimated for each age and gender group indexed by the superscript g , are

$$\ln\left(\frac{L}{N}\right)_t^g = \alpha_0^g + \alpha_1^g T + \alpha_2^g T^2 + \sum_{j=0}^L \beta_j^g UAR_{t-j} + \sum_{i=2}^M \gamma_i^g Q_i + \varepsilon_t^g \quad (4)$$

and

$$\ln(1-UR)_t^g = \delta_0^g + \delta_1^g T + \delta_2^g T^2 + \sum_{j=0}^L \theta_j^g UAR_{t-j} + \sum_{i=2}^M \phi_i^g Q_i + \eta_t^g. \quad (5)$$

Equations (4) and (5) are intended as reduced from approximations for the cyclical determinants of participation and employment. A more structural approach would include additional variables (inflation and the wage rate corresponding to the demographic group g). However, such variables may also be co-determined cyclically with participation and employment, raising problems of endogeneity and identification. The inclusion of the trend and trend-squared terms allows for the long-run trend in growth in the economy, whereas the three variables for the quarters control for seasonality. Controlling for the long-run trend, the UAR variable serves as a measure of the cyclical conditions in the labor market. The unemployment rate is widely considered to be more sensitive indicator of cyclical aggregate demand relative to real GDP (Clark and Summers, 1981; Bils, 1985; Keane, Moffitt and Runkle, 1988; Abraham and Haltiwanger, 1995). In this case, the UR of prime age males is used to proxy the cycle. The specification of equations (4) and (5) allows the UAR to affect the current period labor participation and employment rate with a lag. Recognition lags in the realization that the aggregate cycle has changed and lags in responding to these changes due to frictions and other types of transaction costs may be reasonable explanations of why the UAR of previous quarters may affect current participation and employment. The lag length is specified to be up to eight quarters long (the exercise was also run with 4 quarters). The total effect of the UAR on the labor force participation of group g is given by the sum of the coefficients of the current period unemployment and all its lags, i.e.

$$\beta_{LF}^g = \sum_{j=0}^7 \beta_j$$

whereas the total effect of the UAR on the employment rate ($1-UR$) of group g is given by

$$\theta_{1-UR}^g = \sum_{j=0}^7 \theta_j$$

The coefficients reported for the employment to population ratio are obtained by estimating a version of equation (4) with (E/N) on the left-hand side. In principle, since equation (3) is an identity, the total effect of UAR on the employment to population ratio could also be derived from the sum of the effect of AUR on participation and employment, i.e. $(\beta_{LF}^g + \theta_{1-UR}^g)$.

Table 4.3: Cyclical Response of Participation, Unemployment and Employment by Age and Gender Groups, 1984-2004

Demographic Group	Employment to Population Ratio	Participation Rate	Employment Rate
Women			
12to15	6.22	6.92	-0.70
	0.00	0.00	0.11
16-19	2.63	3.11	-0.48
	0.00	0.00	0.17
20-24	0.15	0.91	-0.77
	0.56	0.00	0.00
25-34	0.63	1.12	-0.49
	0.00	0.00	0.00
35-44	0.85	1.01	-0.26
	0.00	0.00	0.00
45-54	1.30	1.58	-0.28
	0.00	0.00	0.00
55-64	2.02	2.40	-0.38
	0.00	0.00	0.00
65+	2.68	2.97	-0.29
	0.00	0.00	0.01
Men			
12-15	3.89	4.27	-0.38
	0.00	0.00	0.32
16-19	0.25	1.53	-1.28
	0.54	0.00	0.00
20-24	-1.01	0.15	-1.16
	0.00	0.29	0.00
25-34	-0.57	0.07	-0.64
	0.00	0.09	0.00
35-44	-0.36	0.01	-0.45
	0.00	0.00	0.00
45-54	-0.34	0.12	0.46
	0.00	0.03	0.00
55-64	0.01	0.55	-0.54
	0.96	0.00	0.00
65+	0.44	0.86	-0.42
	0.30	0.03	0.00

Note: P-Values below coefficients

Source: Ripani, Santamaría and Skoufias (2005)

An examination of the elasticity estimates for males reveals a different picture. Labor participation of adult males displays a very small sensitivity to cyclical fluctuations. For example, for 20-34 year old males, the estimated labor participation elasticities are not statistically different from zero. Those with 35-44 years of age show a statistically

significant elasticity, but very small. This implies that changes in the employment rate of most males translate almost directly to changes in the proportion of the male population employed. The labor force participation of young teenagers (12-19 years old), on the other hand, appears to be highly sensitive to cyclical changes in aggregate demand. An increase in the UAR of 1 percentage point leads to a 4.3 points increase in the labor force participation of 12-15 males and of 1.5 for those 16-19 years old. Also, the proportion of the teenage boy population employed appears to increase only for the 12-15 group (3.9 points) but the increase is smaller than the increase in the labor force participation rate, meaning that many of them go to increase the unemployment rate. It is important to note that for the 16-19 group, almost all the increase in participation goes to unemployment.

In order to dig deeper into the heterogeneity of response, the model is also estimated for the 12-24 age group, separating those attending school and those that do not, and for age and gender groups 24 and older divided into skilled and unskilled workers. An individual is classified as skilled if he/she has more than 11 years of education, and as unskilled otherwise. These estimates are presented in Tables 4.4 and 4.5.

Table 4.4: Cyclical Response of Participation, Unemployment and Employment by School Enrollment Status of 12-24 Year Olds

Demographic Group	Employment to Population Ratio	Participation Rate	Employment Rate
(a) Not-Enrolled (Not attending School)			
Women			
12 to 15	1.9171 0.091	3.2406 0	-1.3236 0.023
16-19	0.571 0.297	1.58 0	-1.009 0.01
20-24	0.3696 0.109	1.1327 0	-0.7631 0.002
Men			
12 to 15	0.07 0.932	1.2545 0.036	-1.1845 0.01
16-19	-1.719 0	-0.2141 0.366	-1.5049 0
20-24	-1.1717 0	0.0307 0.689	-1.2024 0
(b) Enrolled (Attending School)			
Women			
12 to 15	8.7464 0.002	8.7475 0.001	-0.0011 0.999
16-19	2.9831 0.044	2.4979 0.038	0.4852 0.54
20-24	-0.6035 0.331	-0.1061 0.858	-0.4974 0.202
Men			
12 to 15	6.9169 0.001	6.3953 0.001	0.5215 0.315
16-19	2.3192 0.052	3.1524 0.021	-0.8332 0.139
20-24	-1.0724 0.099	0.0672 0.909	-1.1396 0

Note: P-Values are below

Source: Ripani, Santamaría and Skoufias (2005)

The estimates in table 4.4 reveal that teenage men who are already out of school do not exhibit any significant change in their participation rate, except for the youngest group

(12-15). For the latter, an increase in the UAR of 1 percentage point is associated with an almost equal drop in their respective employment rate and a similar increase in the participation rate. That is, the employment to population ratio practically does not change, meaning that higher participation usually translates into higher unemployment because most of them go to unemployment. The situation for enrolled girls, on the other hand, is different. All the groups respond to declines in economic activity. However, only among the youngest (12-15) does there seem to be any reaction of employment. For the other two groups, most of the girls go to unemployment (especially those in the 16-19 group), and even the estimated elasticities for the employment to population ratio turn out to be non-significant.

Different estimates are obtained for teenage males and females who are enrolled in school. The participation rate of teenage males (12-19 years old) attending school seems to exhibit a high sensitivity to the cycle. In effect, an increase of one percentage point leads to a 6.4 points increase in the participation rate of 12-15 year olds and a 3.2 increase in that of 16-19 year old males. Even though the employment rate of 16-19 year olds falls, this change is non-significant, whereas the one observed in the employment to population ratio is. That is, the large change in the participation rate tends to overtake the decrease in the employment rate resulting in an overall increase in the employment to population ratio of 16-19 year olds (as well as 12-15 year olds).

Table 4.5, also reveals substantial heterogeneity in the cyclical sensitivity of skilled and unskilled workers. Increases in the UAR appear to be associated with increases in the labor force participation rate of unskilled women that, in the majority of the cases, end up in unemployment and, even, in reductions of the employment to population ratio. The exception from this “general rule” seems to be the 45-54 group. The cyclical sensitivity of labor force participation rate of skilled women is similar, but the resulting effects on unemployment do not seem to be as strong (usually lower than the increase in participation rates). As a result, the overall employment to population rate of skilled women does not appear to be affected (all the coefficients are not statistically significant). The corresponding estimates for adult males show a different pattern: participation does not seem to be affected by cyclical variations among the unskilled, and somewhat affected among skilled men. However, the changes in unemployment are negative and sizeable among the unskilled (in general, larger in magnitude than the participation elasticities and statistically significant), while among the skilled they are usually smaller than the changes in participation and some groups even increase their employment rate (decrease unemployment). Indeed, 35-44 year old skilled men increase their participation rates slightly, but their employment rate increases by 0.5 points. However, it is important to note that for the 45-54 year group, women perform significantly better than men, for both the unskilled and skilled categories.

Table 4.5: Cyclical Response of Participation, Unemployment and Employment by Skill Level

Demographic Group	Employment to Population	Participation Rate	Employment Rate
Unskilled			
Women			
25-34	-0.3593 0.064	0.3496 0.015	-0.7089 0
35-44	-0.2583 0.184	0.2386 0.149	-0.4969 0
45-54	0.5108 0.231	0.6657 0.09	-0.1549 0.294
55-64	-1.5463 0.18	-0.9665 0.389	-0.5799 0.041
65+	10.3022 0.018	11.0746 0.008	-0.7724 0.421
Men			
25-34	-0.3903 0.007	0.2304 0.027	-0.6207 0
35-44	-0.3257 0	0.0941 0.023	-0.4198 0
45-54	-0.4713 0.001	0.0357 0.655	-0.5069 0
55-64	-0.0331 0.927	0.5504 0.115	-0.5835 0
65+	0.3746 0.722	0.5316 0.59	-0.1571 0.533
Skilled			
Women			
25-34	-0.0279 0.869	0.5991 0	-0.627 0
35-44	0.1695 0.347	0.6745 0	-0.505 0
45-54	0.5102 0.152	0.904 0.01	-0.3938 0.001
55-64	-0.0464 0.956	0.7019 0.397	-0.7483 0
65+	3.4989 0.107	3.7788 0.066	-0.2799 0.458
Men			
25-34	-0.473 0	0.1372 0.018	-0.6102 0
35-44	-0.3998 0	0.0569 0.075	0.4567 0
45-54	-0.3819 0.003	0.1377 0.082	-0.5951 0
55-64	0.4173 0.17	0.9127 0.001	-0.4954 0
65+	0.2949 0.698	0.3079 0.666	-0.013 0.943

Note: P-Values are below the coefficients

Source: Ripani, Santamaría and Skoufias (2005)

Having provided evidence on the extent to which the cyclical sensitivity of employment and unemployment varies across age and gender groups in the population, it is also useful to get estimates of the relative importance of the various age groups in accounting for cyclical movements in aggregate employment, participation and unemployment. Instead of going through the full set of estimates, Table 6 contains of aggregated measures.

Table 4.6: Demographic Contribution to Cyclical Variation

	Population-Weighted Elasticity of			
	Population Share	(E/N)	(L/N)	(E/L)=(1-U/R)
Teenagers 12-15	0.1028	0.521	0.577	-0.055
Teenagers 16-19	0.1108	0.17	0.264	-0.094
Young Workers 20-24	0.1423	-0.053	0.08	-0.134
Adult Women 25-64	0.3158	0.314	0.422	-0.117
Adult Men 25-64	0.2643	-0.103	0.038	-0.095
Older M & F	0.064	0.11	0.132	-0.022
Total	1	0.958	1.515	-0.518

Source: Ripani, Santamaría and Skoufias (2005)

First of all, note that when aggregate demand decreases by one point, participation grows by 1.5 and unemployment by 0.52 points. Employment (to population) grows almost by one point. Overall the results suggest a substantial change in the gender composition of employment during the business cycle and indicate that teenagers (12-19), young workers (20-24) and adult women (25-64) are the groups that move the most the aggregate unemployment rate in response to cyclical variations. Indeed, the total change in the unemployment rate is explained in 29% by teenagers, 26% young adults and 23% adult women. Adult men have an important effect as well, of around 16%. However, when the population shares are considered (for example 11 vs. 26.5% for the 16-19 year olds and adult men, respectively) and it is found that their effect on the unemployment rate is almost identical, it is evident that the magnitude of the response of the teenagers is striking. The population weighted elasticity estimates of the participation rate for different groups, presented in the third column reveal that, in the general population, fewer adult men, and 20-24 year olds enter employment while more adult females, older persons and younger teenagers enter employment. In fact, the figures are impressive. Teenagers (12-19) account for 56% of the change in participation, while adult women account for 28%. That is, between teenagers and adult women, almost 85% of the change in participation due to cyclical variations is explained. The opposite pattern is observed in the US labor market where, for the economy as an aggregate, a 1-percent increase in the prime-age-male unemployment rate leads to a 1.5-percent decline in the employment to population ratio. Thus, in the US, “discouraged worker” effects appear to be dominant during cyclical fluctuations. The higher unemployment rate tends to discourage potential workers about their prospects of employment preventing them from entering the labor market and searching for a job. In contrast, in Colombia, the increased employment to population ratio suggests that significant “added worker” effects are in operation. The added worker effect states that secondary workers such as women and teenagers who are not strongly attached to the labor force join the labor market when economic conditions deteriorate, and pull out of the labor market when conditions improve (Skoufias and Parker, 2004; World Bank, 2001).

5. THE 2002 LABOR REFORM: GAUGING ITS IMPACT¹⁶

SUMMARY

This chapter seeks to gauge the impact of the 2002 labor reform on the key labor market outcomes, namely, employment, hours worked, wages and informality. Additionally, a brief evaluation of the performance of the social protection measures is carried out. The evaluation indicates that the reform impact appears to have been positive in many respects, especially in reducing informality, underemployment (due to insufficient hours), increasing the pace of employment generation, especially for the young and reducing unemployment duration. Also, the introduction of the unemployment insurance system was a step of the utmost importance, which, in any case, needs refinements. However, other instruments, mainly related to employment opportunities for HEG, have not functioned appropriately and should be revised. It is important to note that there are different views on the effectiveness of the reform among researchers in Colombia, including the ones who provided input for this Report. Thus, this chapter tries to explicitly or indirectly address these concerns and diverse views.

Within the context presented in the previous sections, since 2000/1 it was quite clear that a reform to labor market regulations (in a broad sense) was badly needed, accompanied by more effective social protection instruments. Since then, it has been apparent that labor regulations were not favoring formal employment creation and that many sub-groups of the population encountered a more difficult relative situation in the labor market. Additionally, the recession brought other problems to the surface, notably the difficulty for the labor market to adjust in a less painful way and the lack of adequate protection systems for the vulnerable segments of the population when faced with labor market related shocks, such as unemployment or income declines.

Thus, the 2002 labor reform (Ley 789 de 2002), which draw on previous draft bills, attempted to formalize employment and increase the pace of employment generation by removing some of the obstacles described in the previous sections of this report (mainly by reducing extra-payments for nocturnal and holiday work, reducing firing costs and by introducing some flexibilization to non wage costs). Also, one of the objectives was to increase the number of hours worked in some sectors, which were perceived as overly regulated, in the sense that regulations did not match their productive realities. This was the case for the services and commerce sectors in which, for example, the usual work shift (diurnal vs. nocturnal) does not correspond to that found in other, more traditional, sectors. This objective was also closely linked to the goal of trying to favor formality in those sectors, which showed the highest levels of informality. At the same time, measures were included to favor employment and formality of hard-to-employ groups (HEG) of the population (these include women, young workers and the disabled, among others). The most important of these measures, undoubtedly, was the reform of the apprenticeship contract (AC). Finally, a whole set of social protection measures was included in order to begin to create a more effective “social protection system” that helps people in managing

¹⁶ This section is based on four studies commissioned especially for this Report: Amarante and Arim (2005), Díaz and Santamaría (forthcoming), Gaviria (2005) and Núñez (2005). Other materials, such as, López (2004) and Comisión de Seguimiento a las Políticas de Generación de Empleo (2005) were also used.

risks stemming from the labor market. Chief among these measures was the introduction, for the first time in Colombian history, of an unemployment insurance system. The reform, however, did not directly touch other aspects that affect labor market outcomes importantly, such as non-wage costs or the minimum wage (although some measures at least tried to flexibilize them, e.g. the AC). Box 5.1 presents a summary of the reform.

Box 5.1: The Labor Reform – Law 789 of December 27, 2002:

Measures to create and formalize employment. The labor reform extended the diurnal shift, defining it as being from 6 am to 10 pm (before it was from 6 am to 6 pm). This measure reduced premia paid for nocturnal work (40% over the regular wage). Likewise, the law allowed flexible working hours for the commerce and service sectors, which might vary between 4 and 10 hours a day without going over 48 hours per week; those working hours can be at any time of the day and any day of the week. On the other hand, extra-payments for work on Sundays and holidays were slightly reduced. The law reforms the apprenticeship contract (AC) by, first, removing the contractual obligations between employers and apprentices (“deslaborización”), so, in practice severance payments are eliminated. Second, the ACs are exempted of paying *parafiscales*. Third, the new regulation allowed remuneration lower than the minimum wage: 50% in the learning phase, and 75% in the practical one. The law enacted the obligation to contract apprentices in firms that have 15 or more employees, according to the number of workers. In addition, firing costs were reduced, in higher proportion to workers with 10 years of tenure or more. Differential severance payments for unjustified separations, according to the wage rank, were established. Finally, the reform allowed refunding of *parafiscales* to those firms that carry out on-site training. The previous labor reform (Ley 50 de 1990) had reduced significantly severance payments and established the *salario integral*, which allows employers to convert non-wage costs into wages, provided that the worker proves that s/he is making pension and health contributions.

Social Protection Measures. An unemployment insurance (UI) scheme was established, with resources coming from an additional point on *parafiscales*, in particular those administrated by the CCFs. The regulation establishes that the subsidies must be focused on both unemployed who were members of the CCFs at any time during the last three years (in a higher share) and the unemployed who have not made contributions (i.e. were informal workers).

Employment of HEG. Incentives were included to increase employment among vulnerable groups, through the exemption of *parafiscales* to the firms that employ (i) poor heads of household; (ii) ex-guerrillas under a state program (*reinsertados*); (iii) handicapped; (iv) people between 16 and 25 years and older than 50; and (v) ex-convicts. Of course, the AC serves also the purpose of favoring employment of a particular HEG, the young.

Of course, trying to evaluate the impact of a policy change of the magnitude of a labor reform, which is bound to affect large portions of the labor market in diverse ways, is an extremely difficult task, and even more when the trends of aggregate economic activity shifted at the same time as the policy change was introduced (i.e. growth picked up in 2003, after years of being stagnated). The fact that less than two years have passed since the introduction of the reform does not help either (the reform went into full effect in April 2003). However, the reform itself (in its Article 46) included a mandate to evaluate its impact two years after its enactment to introduce adjustments to those regulations deemed as ineffective or counter-productive, or to reverse it if it was negatively evaluated. Therefore, in this report, a set of alternative methodological approaches was envisaged to undertake this task. They are based on (i) a special survey for firms that included questions that specifically asked for the use of the new regulations by entrepreneurs (labeled FS from now on)¹⁷; (ii) the analysis of administrative data; and,

¹⁷ For a description of the survey see Gaviria (2005). For now, it is enough to mention that it consisted of 1,021 firms located in Bogotá in all sectors of economic activity. 25% were in the manufacturing sector, 41% in commerce and

more importantly (iii) the use of household survey data (ECH) for the period 2001-2004 to isolate the impact of the reform on important labor market outcomes, such as employment, formality, hours worked and wages. For this last information source, the empirical strategy was almost completely based on “differences in differences (DID)” estimators, which allow the isolation of the effects of certain events on the evolution of outcomes of interest. As is well known, the main difficulty of DID type estimators is the selection of what is called the “control” and “treatment” groups. The latter refers to that group of the population which is supposedly affected by the event in question (in this case, the reform), while the former is composed of individuals who were not impacted by it. For them to constitute valid comparators, they should be composed of “similar” individuals and be subject to the same shocks, except the event being analyzed. In this context, the election of the treatment and control groups is key for the validity of the results obtained. Many alternatives were used here for treatment and control groups due to the conceptual difficulty of finding similar groups of workers that are or are not affected by the reform, and taking into account the constraints imposed by the data. Hence, the reader is cautioned that the results should be interpreted with this caveat in mind. Box 5.2 explains the DID methodology in some detail.

Box 5.2: Differences in Differences Estimators: DID estimators are simple panel data methods applied to sets of group means in cases when certain groups are exposed to the causing variable (the reform in this case) and others not, and it is well suited to estimating the effect of sharp changes in policy variables (Angrist and Krueger, 1999). It constitutes an identification strategy to answer “what if” questions when the counterfactual is not observed (here, the counterfactual is what would have happened had the reform not been enacted). Suppose, for example, that interest lies on the effect of the reform on employment, labeled Y . If Y_{0i} is the employment status if individual i without reform and Y_{1i} is the employment status of the same individual with the reform, ultimately the outcome of interest is $Y_i = Y_{1i} - Y_{0i}$ (1). Note that the last term is not observed since the researcher only gets to see the status of the individual given that the reform actually happened. Thus, what the DID method does is to approximate the whole subtraction (1) with observed outcomes, by taking a before and after observation of groups that are and are not affected by the reform, so

$$Y_i = (Y_{1,t,i} - Y_{1,t-1,i})_r - (Y_{1,t,i} - Y_{1,t-1,i})_c \quad (2)$$

Where r stands for the treatment group and c for the control one. Note that all the subscripts related to whether a group was subject to the reform or not are equal to one, because the other state (zero) is not observed. (2) is equivalent to restricting the conditional mean function of the dependent variable as the sum of a year effect that is common to both groups and a group effect that is fixed over time (this is how identification is achieved). It is straightforward to show that Y_i is equal to B_4 in the following expression

$$Z_i = \beta_1 + \beta_2 T_i + \beta_3 R_i + \beta_4 T_i R_i + \beta_5 X_i + \varepsilon_i \quad (3)$$

Where T is a dummy variable that identifies the groups (treatment=1 vs. control=0), R is a dummy variable that takes on the value zero if the period is pre-reform and one otherwise, and X is a vector of personal characteristics (age, education, gender and city of residence). It may include, additionally, controls for the economic cycle and seasonality, depending on whether more than two quarters are used (note that not necessarily the function has to be a linear one like in this case). Thus, the DID estimator (which is the coefficient on the product of T and R) only applies to those observations that belong to the treatment group ($T=1$) and are post-reform ($R=1$), which is the intuitive explanation of why it is equal to (2). As mentioned in the text, the most important caveat of the DID methodology is the election of treatment and control groups, because the key identifying assumption is that the interaction term in (3) is zero without the reform, which means that trends in the left variable (in our case employment, formality, hours or wages) should be quite similar for both groups when economic conditions are similar (e.g. when the economy is growing).

18% in personal services, resembling closely the overall distribution of employment. The share of firms under 10 workers was 41%, while those with 10-50 workers comprised 34%, and larger firms accounted for the remaining 25%.

A second caveat relates to the firm survey. Many of the questions related to the reform are more of a qualitative nature and do not ask for numbers of jobs created or reductions in costs. As such, the responses constitute useful evidence on the impact of the reform but must be interpreted with care, as they represent opinions from the entrepreneurs.

With these caveats in mind, the main results of the evaluation are presented in what follows. For clarity and, given that in some areas there are some mixed results, the exposition will start with those that seem to leave no doubt. Also, the discussion will start with results directly related to labor market outcomes (employment, informality, hours, and wages) and will finish with a brief evaluation of the social protection related provisions. It should be noted at the outset that no attempt will be made to estimate how many jobs the reform has created because this is an impossible task.

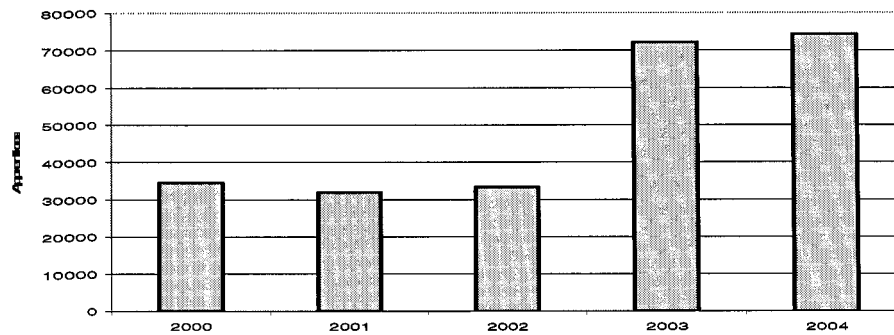
Before going to the results of the evaluation, however, it is useful to summarize here the trends related to the main labor market outcomes in the last four years. Over that period:

- (i) employment grew importantly, but the growth rate declined in 2004;
- (ii) participation decreased in 2004;
- (iii) as a result, unemployment fell continuously, but more markedly in 2003-2004;
- (iv) Salaried employment increased, at the same time that informality fell, especially in the period 2003-2004; and
- (v) wages of salaried workers increased (some 22% for women and 13% for men) in 2003-2004, while those of the self employed remained stable.

Employment of young workers: this is probably the one area in which there seems to be complete agreement about the positive effects of the reform. In particular, the introduction of the AC, which “de-laboralized” the contractual relationship between the apprentice and the firm (i.e. now there is no formal contract that would make labor regulations binding) and allowed firms to hire apprentices for less of the minimum wage, seems to have had an important effect on employment of younger workers. This assertion is backed by all the data sources.

First, administrative data from the training institution (SENA) and the Ministry of Social Protection (MPS) are very telling. Figure 5.1 shows the number of apprentices under the AC for the period 2000-2004, as reported by the firms to SENA. Note that in the pre-reform period (2000-2002) the number of apprentices showed practically no change, as if an equilibrium level, given regulations and market conditions, had been reached. After the introduction of the labor reform, however, the number more than doubled (from 33,337 in 2002 to 72,087 in 2003) and, again, seemed to remain stable in 2004, when compared to 2003. This increase in the number of apprentices (approximately 40,000) represents more than 4% of all employed individuals between the ages of 18 and 25 years in June 2004 in the main seven cities. However, they are 6.5% of those working as private salaried workers, which is a sizeable share. It is important to note that among the total number of apprentices hired in 2003, almost 20% came from institutions other than SENA, reflecting a more competitive environment in the training market.

Figure 5.1: Number of Apprentices Working under AC



Source: MPS (2005)

The FS, on the other hand, provides additional evidence on the impact of the introduction of the AC. In particular, 35% of the firms reported to have increased the number of apprentices in 2003, compared to only 17% in 2002. On average, these firms increased their use of apprentices by 7.6 individuals in 2003. The firms that increased the number of apprentices in a larger proportion were those with more that 250 employees (50% reported to have increased), those with 100-250 workers (43%) and those with 10-50 workers (around 35%). Thus, it seems that larger firms have taken more advantage of this instrument, which is a fact that deserves more attention from the policy side (i.e. a priori, one would think that smaller firms would be able to benefit from the cost reduction that the AC entails and from the greater availability of semi-qualified workers). Finally, firms that export part of their production increased the number of apprentices hired in a greater proportion than those that only produce for the domestic market (42 vs. 32%).

The last exercise conducted to check the impact of the reform on employment of young workers used data from the ECH and was based on the DID methodology. It consisted of a two stage procedure, in which in the first stage the probability of being employed was estimated for the whole sample using a Probit model with education, age and gender dummies as explanatory variables, and controlling for other household characteristics of the individual and his/her city of residence. In the second stage the DID methodology, as described in Box 5.2 was applied to these employment probabilities (controlling and not controlling for personal characteristics), using individuals aged 14-24 as the treatment group, and those 25-28 years of age as the control group. All the quarters from 2001/1 to 2004/2 were used and thus controls for the cycle and seasonality were included. The time dummy (R in Box 5.2) was defined as taking the value of one starting in the second quarter of 2003 because the AC went into effect in April/2003. The treatment group was chosen based on the fact that the AC is directed towards this group of individuals, while the control group corresponds to one which is very close in characteristics to the treatment and its employment trends are also quite coincident. Results obtained from the exercise are shown in Table 5.1.

Table 5.1: Impact of the Labor Reform on Employment of Young Workers (18-24).

V a r i a b l e	C o e f f i c i e n t	T - v a l u e
D u m m y R e f o r m	0 . 0 1 0	1 6 . 7
D u m m y T r e a t m e n t	- 0 . 0 0 2	- 3 . 6
D I D	0 . 0 1 0	1 7 . 4
M e n *	0 . 0 4 2	1 7 0 . 1
A g e	0 . 0 3 9	1 0 3 . 3
A g e S q u a r e d	- 0 . 0 0 1	- 5 4 . 3
G D P	0 . 3 2 9	2 0 . 6
N o E d u c a t i o n **	0 . 0 1 5	1 0 . 8
P r i m a r y I n c o m p l e t e **	0 . 0 2 3	3 3 . 0
P r i m a r y C o m p l e t e **	0 . 0 3 5	6 9 . 0
S e c o n d a r y **	- 0 . 0 0 6	- 1 6 . 3
T e r t i a r y I n c o m p l e t e **	- 0 . 0 1 0	- 2 5 . 0
C o l l e g e **	0 . 0 5 1	8 8 . 7
B a r r a n q u i l l a ***	0 . 0 1 0	2 1 . 5
B u c a r a m a n g a ***	- 0 . 0 0 4	- 7 . 5
B o g o t á ***	- 0 . 0 1 2	- 3 5 . 7
M a n i z a l e s ***	- 0 . 0 2 3	- 2 7 . 6
C a l l ***	0 . 0 2 1	4 8 . 3
P a s t o ***	- 0 . 0 2 1	- 2 4 . 5
S e a s o n a l (q 1) ****	- 0 . 0 0 9	- 2 8 . 0
S e a s o n a l (q 3) ****	- 0 . 0 0 3	- 9 . 0
S e a s o n a l (q 4) ****	0 . 0 3 0	8 4 . 9
C o n s t a n t	0 . 0 7 3	2 1 . 0
* C o m p a r e d t o w o m e n		
** C o m a p r e d t o S e c o n d a r y I n c o m p l e t e		
*** C o m p a r e d t o M e d e l l i n		
**** C o m a p r e d t o q u a r t e r 2		

Note: the DID estimator is highlighted

Source: Authors' calculations

The results of the regression indicate that the reform had a positive and statistically significant effect on the probability of being employed for workers aged 14-24 years (the size of this effect is an increase of the probability of about one percentage point), which confirms the results obtained with the administrative data and the FS (note that all remaining variables have the expected sign, especially education, gender, age and GDP). The regression was also run for each gender separately, showing that the effect of the reform was much larger for men than for women within this age range.

Therefore, from the evidence it can be concluded that the effect of the reform on the employment possibilities of apprentices was positive and sizeable as a result of the changes introduced to the AC in the new legislation. However, three caveats should be mentioned: (i) it is impossible to know if this result completely reflects a response by the firms to the reduced costs and increased flexibility to hire apprentices or if it is due in part to the hiring obligation imposed by the law, based on the number of employees in the firm, which is even more important when taking into account that larger firms were shown to be ones that used the instrument in a larger proportion; (ii) with relation to the previous point, some firm managers, especially in the textile sector, during the qualitative work conducted with them expressed that they sometimes perceive the AC as another tax imposed on them due to the obligation to hire a determined number of apprentices. This aspect should be discussed more profoundly among employers and policy makers; and (iii) it should be further investigated (task that will need the collection of special data) if

firms are using the AC to replace regular workers with apprentices (although the regulatory decrees impose severe restrictions that seem to have avoided this problem).

Informality: four specific measures of the reform were expected to better the quality of employment that was becoming more informalized, at least until 2001: (i) the cost reduction brought about by the increase of the diurnal shift; (ii) the possibility of the employer and the worker agreeing on specific shifts, which could cover nights or holidays and that would be considered as a “regular” shift (i.e. there would be no cause for extra payment) as long as the maximum allowed weekly shift of 48 hours was not exceeded; (iii) the decline in firing costs, especially for workers with more than ten years of tenure; and (iv) the introduction of the AC. Also, as mentioned before, it was likely that these measures, especially the first two, would have a greater impact on certain sectors, such as services and commerce, which operate in odd shifts (nights, holidays). Most of the evidence in this respect points to a favorable impact of these measures on the level of formality. Before going into this evidence, however, it is useful to inspect Table 5.2, which shows flows between formality and informality in 2001 and 2004. The percentage of workers who left informality and became formal increased substantially (from 18 to 21.7%), while the proportion of people who made the opposite movement decreased from 45 to 42.7%. The flow from informality to informality (i.e. people who switched jobs within the informal sector) declined as well.

Table 5.2: Flows Between Formality and Informality, 2001 and 2004

Current (> Previous (v)	Informal		Formal	
	2001	2004	2001	2004
informal	82.0	78.4	18.0	21.7
Formal	45.0	42.7	55.0	57.3

Source: Gaviria (2005)

Turning now to the specific econometric evidence on the impact of the reform, the first exercise carried out approximated flows in and out of employment and, for the case of in-flows, an analysis of where they were directed (formal or informal sector) was carried out. More specifically, flows were approximated with the probability that an unemployed individual goes from unemployment to work in the formal or informal sector. The DID methodology was used, defining the treatment group as the set of formal salaried workers, while the control group is given by the self-employed, which, by definition, are not affected by the reform (some results below provide increased confidence about the validity of this control group). The dependent variable in the model was unemployment duration¹⁸ and the functional form used to estimate the DID model was the Weibull¹⁹. Since the information required for this exercise is only collected in the second quarter of each year, the second quarter of 2002 was used as the pre-reform time (i.e. $T=0$) and the second quarter of 2004 as post-reform (See Núñez, 2005).

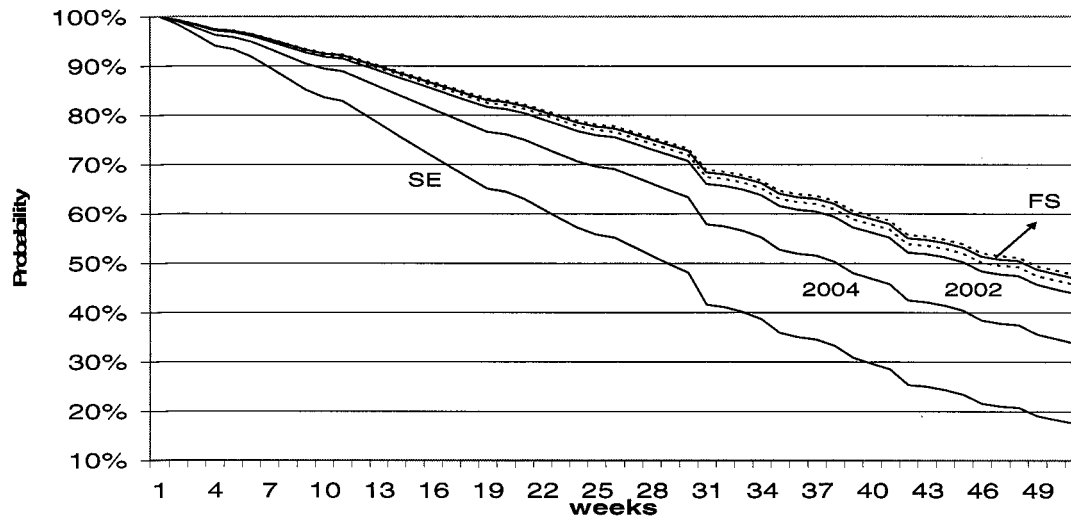
¹⁸ Which corresponds to the conditional probability of remaining unemployed, given that the individual has already been unemployed a certain amount of time (hazard rate).

¹⁹ The identification of the treatment and control groups was difficult because many of the observations correspond to unemployed individuals. Thus, it was decided to use the occupation that the unemployed person said that he/she was looking to become employed.

The DID estimator shows that, due to the reform, the probability of going from unemployment to employment as a formal salaried worker increased by 5.8%, on average. Thus, there is no ambiguity in the assertion that the reform brought about an increase in the probability of finding employment in the formal salaried sector *vis-à-vis* self-employment. To present the results more clearly, Figure 5.2 shows the estimated probabilities of remaining in unemployment for each group (FS and SE) over time, measured in weeks (hazard functions). Figure 5.3 tries to better explain the information in figure 5.2 by making a cross cut at the 52nd week. Combining the information of the two graphs, it is clear that (i) all along the time span the probability of going out of unemployment is much lower for those who move to self-employment, shown by the two lines labeled SE and FS. For example, at the 52nd week (i.e. looking at figure 5.3), an unemployed person that looked for a job in the formal sector had a probability of about 47% to still be found in unemployment, while had he/she looked in the SE sector, that probability would be 18%; (ii) the probability of remaining in unemployment at each week declined in 2004, when compared to 2002. For example, at the 52nd week, an average unemployed individual in 2002 would be unemployed with 45% probability, while these number had declined to 34% in 2004 (note that points (i) and (ii) are not yet related to the reform, because these are the coefficients on the “first difference” terms, T and R in the language of Box 5.2); and (iii) most importantly, the reform reduced the probability of remaining in unemployment given that the individual is looking for a formal sector job. That is, it increased the probability of moving from unemployment to formality. This is shown by the two dotted lines that capture the DID estimator. For example, at the 52nd week, an average unemployed individual before the reform looking for a job in the formal sector would be unemployed with 48% probability, while this figure decreased to 45.6% after the reform. A possible criticism to this exercise is that in 2004 the economy was growing again, contaminating the results. To check this possibility, the exercise was repeated for 2001 vs. 2002, when the occupation rate grew 0.5 percentage points, a number very similar to that observed between 2002 and 2004. The results were a DID coefficient very close to zero and statistically non-significant, providing support to the previous conclusions.

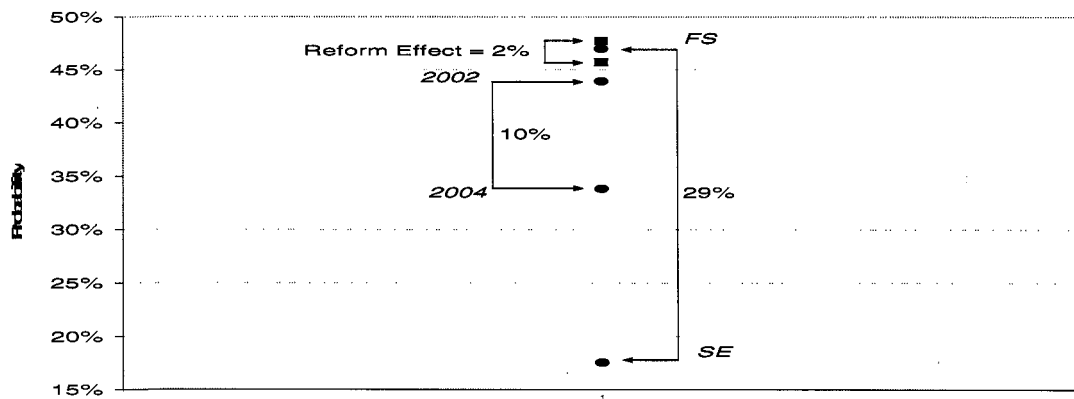
Now, taking into account that some of the measures were intended to affect some sub-groups of the population specifically (the AC, for example), an additional exercise was carried out to check if this actually happened. Basically, the same model was estimated, this time including an interaction term between the DID coefficient and dummies for the young (14-25) and workers having between 6 and 15 years of education, who are the direct beneficiaries of the new AC. These coefficients turned out to be significant, indicating that young workers increased the probability of moving from unemployment to formal sector employment 4.7%, while the figure for the other group was 6.4%.

Figure 5.2: Probabilities of Remaining in Unemployment



Source: Núñez (2005)

Figure 5.3: Probabilities of Remaining in Unemployment at the 52nd Week



Source: Núñez (2005)

The second exercise consisted of a simpler application of the DID methodology. In particular, the specification included the status of the individual in the labor market (formal vs. informal) as the outcome variable, with informality defined in two alternative ways: using the ILO-type definition (discussed in previous sections), or using affiliation to health insurance as a proxy for formality. The treatment group was chosen to be the commerce and services sectors, while the manufacturing sector²⁰ was the control group. The choice of the treatment and control groups was based on three important considerations: (i) most of the new measures in the reform designed to formalize employment were specifically directed towards commerce and services (e.g. the increase of the diurnal shift); (ii) the manufacturing sector displays levels of formality

²⁰ Two samples were used for the exercise: in the first one all the employed individuals were included, while the second one only used only private salaried workers.

substantially higher than those observed in commerce and manufacturing, which means that the expected effects of the reform are much larger in the latter. For example, while the level of formality (ILO definition) was around 60% in 2004 in the manufacturing sectors (with many sub-sectors having formality rates above 75%), it did not reach 15% in the other two sectors; and (iii) the employment trends of these sectors are very similar in times of high economic growth, like the one observed in the post-reform years. Again, controls for personal characteristics were included in the estimations. All the exercises were carried out for the entire sample and each education group separately. The results are presented in Table 5.3 (only the DID coefficients are shown).

Table 5.3: Impact of the Labor Reform on Formality

	Entire Sample	Primary Incomplete	Primary Complete	Secondary Incomplete	Secondary Complete	Tertiary Incomplete	College
<i>A- All employed. Treatment Group: Commerce and Services</i>							
<i>DID</i>	-0.052	-0.128	-0.052	-0.049	-0.075	0.044	0.066
<i>T stat</i>	(3.10)*	(2.89)*	(1.41)	(1.60)	(2.31)*	(0.71)	(1.13)
<i>B- Only Private Salaried. Treatment Group: Commerce and Services</i>							
<i>DID</i>	-0.077	-0.251	-0.111	-0.099	-0.072	0.019	0.011
<i>T stat</i>	(3.53)*	(2.57)*	(1.71)*	(2.12)*	(1.95)*	(0.30)	(0.18)

Note: * means significant at least at 10%

Source: Amarante and Arim (2005a)

The results indicate that the reform had a sizable and significant effect in reducing informality in high informal sectors, such as commerce and services. This effect can be found for the entire sample and for the groups of least educated workers (primary incomplete, complete and both levels of secondary), being particularly large among the least skilled, who experienced a reduction of the probability of being informal of between 13 and 25%, depending on the control group chosen. Note that the size of the coefficient for the entire sample is similar to the one obtained previously (between 5.2 and 7.7%). In an additional estimation using affiliation to health and pensions separately as dependent variables, most of the coefficients turned out to be not statistically significant when comparing services vs. manufacturing and commerce vs. manufacturing. Only the health coefficient was significant in one of the specifications, which controlled for personal characteristics of the workers (see Gaviria, 2005).

The final exercise shifted attention towards the size of the firm to define the control and treatment groups. The argument rests on the observation that formality among small and medium sized firms is extremely low when compared to that observed among large firms, implying that the effect of the reform is expected to fall on the former group. In fact, given the formality levels observed among large firms, the expected impacts on this group are close to zero. For example, in the second quarter of 2004, under the ILO definition, around 95% of the workers employed in small and medium size firms were informal, while the figure among the large ones was exactly the opposite (5%). If affiliation to health is analyzed instead (i.e. considering a worker who is not affiliated as informal), the proportion of formal workers among small and medium firms is much higher (around 67%), but still substantially lower than among large firms (97%).

In the first specification the periods used were 2004 vs. 2002 and 2004-2003 vs. 2002 (second quarters) and the dependent variable was whether the individual is affiliated or not to health and pensions separately. The results are shown in Table 5.4, below. In this case, the evidence is more mixed. In particular, in the case of health the coefficients point to an effect of the reform in increasing affiliation in small firms compared to large firms. In the case of pensions, on the other hand, there is no evidence of any impact, as the only coefficient that is significant has the wrong sign.

Table 5.4: Impact of the Labor Reform on Formality by Firm Size

	DID without X	DID with X
Health		
2002 vs 2004	-0.0283	-0.0243
	-3.99*	-3.55*
2002 vs 2004/03	-0.0325	-0.0298
	-5.22*	-4.96*
Pensions		
2002 vs 2004	0.0052	0.0106
	0.81	1.71*
2002 vs 2004/03	-0.0002	0.004
	-0.04	0.75
* Significant at least at 10%		

Source: Gaviria (2005)

Thus, to conclude, it can be said that, when using a broad version of formality such as that of the ILO, most of the evidence points to a favorable impact, concentrated in the least skilled. However, when the topic is analyzed using affiliation to health and pensions the situation is not so clear, especially in the case of pensions. This is consistent with the data presented in previous sections that show an important reduction of informality in the latest years. It is also consistent with administrative data that show that after the reform affiliation to the CCFs grew by 378,000 persons, while affiliation to insurance against professional risks (disability caused in the job) increased by 603,000 and to health insurance (excluding the subsidized program) by 483,000.

Hours worked: another of the main objectives of the reform, which is also related to the broader objective of bettering the quality of employment, was to increase the number of average hours worked, especially in commerce and services. This objective was explicitly stated in the statement of purpose of the reform (Exposición de Motivos), and the instrument intended to achieve this was the extension of the diurnal shift. Thus, a DID exercise was performed to capture this impact. In particular, in a first instance the manufacturing sector was used as the control group, comparing it against commerce and services, as these sectors were thought to be the main beneficiaries of the new provisions. Again, in this first exercise the periods used were 2004 vs. 2002 and 2004-2003 vs. 2002. The dependent variable was the status of the individual: underemployed because of insufficient hours (UIH) or not²¹. The results are presented in Table 5.5.

²¹ The ECH includes a question that asks the individual if he/she is working fewer hours than he/she would be able to. If the answer is positive he/she is considered as underemployed because of insufficient hours.

Table 5.5: Impact of the Labor Reform on Underemployment Because of Hours by Sector

	DID without X	DID with X
Services vs. Manufacturing		
2002 vs 2004	-0.0182	-0.0171
	-4.26*	-4.02*
2002 vs 2004/03	-0.0200	-0.0195
	-5.12*	-5.00*
Commerce vs. Manufacturing		
2002 vs 2004	-0.0103	-0.0101
	-3.25*	-3.22*
2002 vs 2004/03	-0.0094	-0.0088
	-3.26*	-3.05*
* Significant at least at 10%		

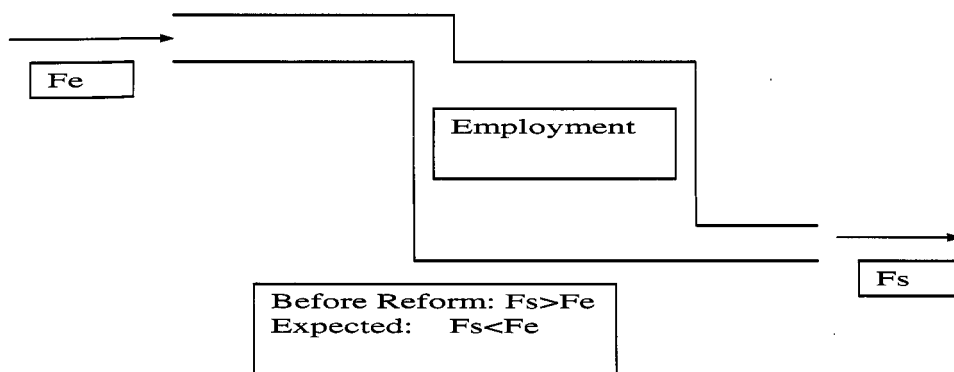
Source: Gaviria (2005)

The table indicates that the effect of the reform was to reduce UIH in the services and commerce sectors relative to manufacturing, as all the coefficients are negative and (highly) significant, which was exactly the expected outcome. To confirm the validity of these results, another exercise was performed. It consisted of using all the quarters from 2001/1 to 2004/2 and used as the outcome (dependent) variable the number of hours worked, as reported by the individuals in the ECH, using the same treatment and control groups, but in a unified way, i.e. services and commerce vs. manufacturing (two samples were used alternatively: all the employed population and only salaried workers). The results indicate a positive and (borderline) significant effect of the reform on the number of hours worked only when services and commerce are used as the treatment.

Employment and unemployment: this is one of the most controversial subjects related to the reform, and also one where the results tend to be more mixed compared to the other outcomes already analyzed. As described above, the pace of employment creation increased importantly from 2003, although some momentum was lost in 2004. The timing of this event constitutes informal evidence that the reform may have played a role in improving conditions in the labor market. However, making this link (between the increase in employment generation and the reform) is not an easy task and thus several exercises were conducted to try to establish if there is actually a causal relationship between the two. The first of these was already partially reported when analyzing informality and is related to unemployment and employment duration. The argument rests on the fact that, before the reform, the situation was one in which the flows out of employment (F_s) were larger than the flows from unemployment to employment (F_e). Figure 5.4 tries to capture this situation. If this was indeed the case and it can be shown that unemployment duration (UD) declined and employment duration (ED) increased, it can be inferred that the reform positively affected the stock of employment at any point in time. This empirical strategy is favored by the fact that, as shown in Bentolila and Bertola (1990) and Núñez (2005), theoretically the only variable for which the expected effects of this type of reforms are unambiguous is UD. Indeed, measures such as reduction of costs due to the increased diurnal shift or the decline in firing costs may have ambiguous effects on employment (or unemployment), but they are certainly supposed to drive down unemployment duration (see Núñez, 2005 for a detailed explanation of this

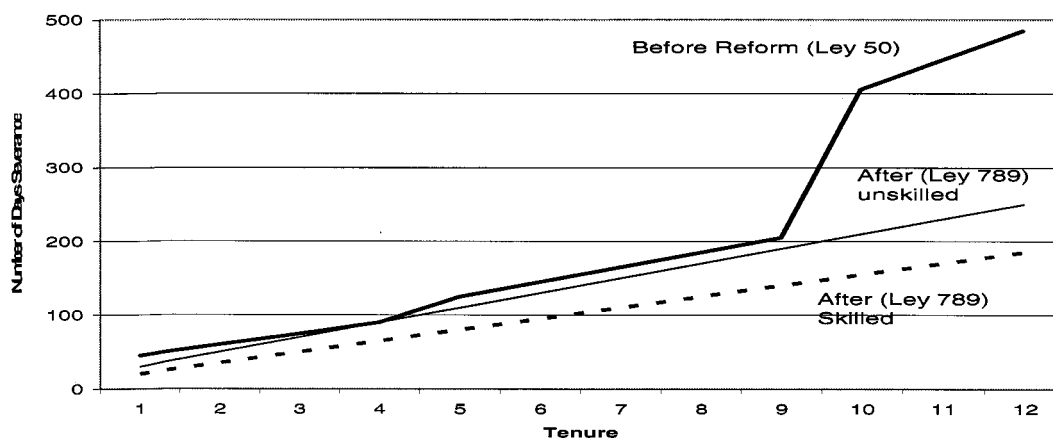
fact). The effect on employment duration, however, is ambiguous (at least in the short run), because measures such as the reduction of firing costs may imply destruction of unproductive jobs that existed only to avoid high firing costs, implying that ED would be reduced in the short run (and unemployment may grow), while in the longer run it is likely that ED will increase because of the elimination of the incentive that existed in the previous legislation to fire workers before they reached ten years of tenure, which is evident in Figure 5.5.

Figure 5.4: Labor Market Flows and the Situation before the Reform



Source: Núñez (2005)

Figure 5.5: Severance Payments (number of days) Before and After the Reform

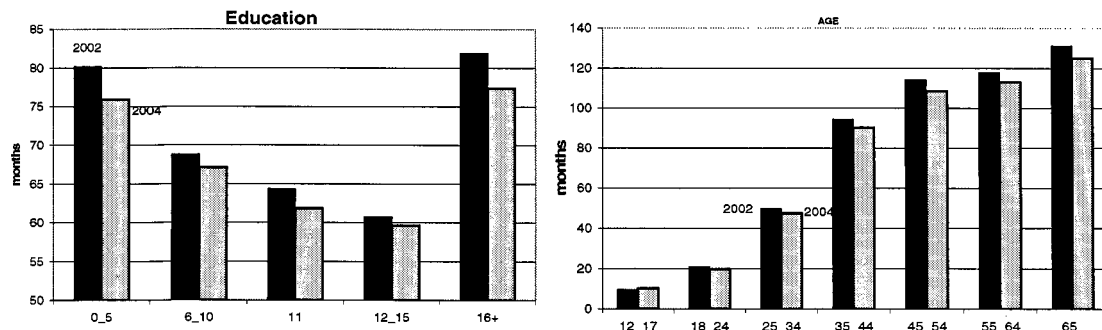


Source: Núñez (2005)

In this context, in the section where the effects of the reform on informality were analyzed, it was found that in 2004 unemployment duration was reduced (figures 5.2 and 5.3) and that the probability of going from unemployment to the formal sector increased by almost 6% as a direct result from the reform. Additionally, it was discussed how this change affected the young and the unskilled in larger proportion. Thus, it remains to be seen if the duration of employment was affected by the reform. Figures 5.6 show ED by age and education groups. It can be seen that ED declined for every group, except those

workers between 12-17 years of age, reflecting precisely the fact discussed above related to the destruction of unproductive jobs (of more than ten years of tenure) that existed prior to the reform.

Figures 5.6: Employment Duration in 2002 and 2004 for Education and Age Groups



Source: Núñez (2005)

To carry out the task of disentangling the effect of the reform on ED, a DID model with the outcome variable being the probability of remaining in employment, given that the individual already has been employed a certain amount of time was estimated. However, in this case the choice of treatment and control groups appeared trickier because it was not as clear what sectors were supposed to be affected by the measures. Also, talking about employment duration in salaried vs. self-employment involves different concepts, as employment duration in each of these occupations may be determined by very different factors. Thus, four choices of treatment and control groups were used based on sector (2) and size of the firm (2), but only the one that defined the treatment group as salaried workers working in large firms in the service, commerce and manufacturing sectors is reported (the control group is composed of those workers in small and medium firms in the same sectors)²². The results, which are statistically significant, point to a reduction of the probability of an individual losing his/her job of around 29% in the services sector, 7% in manufacturing and 23% in financial services, providing support to the hypothesis that the effect of the reform was a positive one in ED. Again, it was investigated whether this effect was stronger for some population group. The answer was no. It appears that the entire sample used in the exercise was affected proportionally. Therefore, and given the initial discussion, the reduction of unemployment duration and the increase of ED brought about by the reform indicate, although indirectly, that the reform may have impacted employment generation positively.

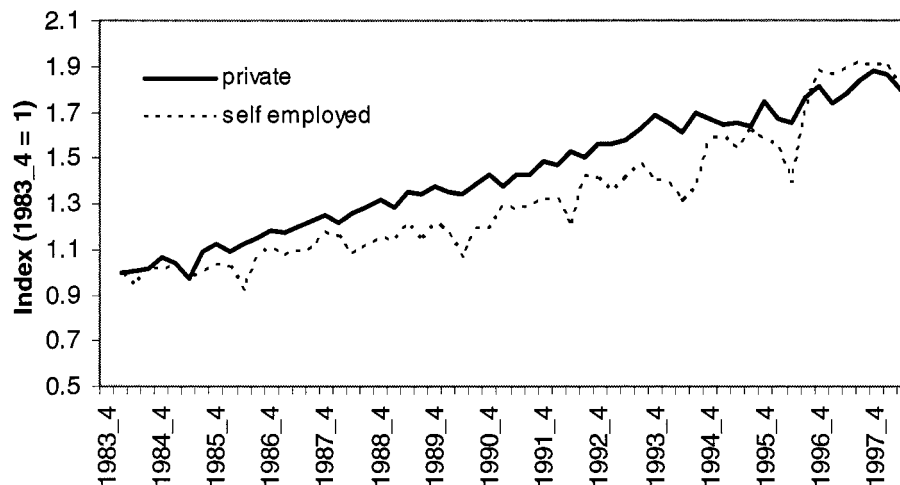
Notwithstanding this fact, since this evidence is indirect and the ED results are not particularly robust given the choice of treatment and control groups, two additional exercises were carried out. The first consisted of a two stage procedure, in which in the first stage the probability of being employed for every person older than 14 years of age was estimated using a Probit model, including key personal characteristics as explanatory variables (education, gender, age, city of residence, marital status, position within the household, etc.). In the second stage, a DID model was fitted, using this probability as the

²² It should be noted that the four models run produced very similar results, indicating some robustness of the results.

outcome variable, and taking the treatment group to be the formal salaried sector and the control being self-employed. In this case, the choice of these groups seems appropriate for two reasons: (i) the flexibilization measures included in the reform, as discussed above, affect by definition the salaried sector and not the SE, which functions basically as an unregulated labor market, where minimum wages, firing costs, extra payments and non-wage costs have no meaning; and (ii) as shown in Figure 5.7, below, their employment trends in times of economic growth, like the one during 2002-2004, are extremely similar (also, in the exercise the sample was chosen such that the means of the most important variables are broadly coincident). The DID model included controls for personal and household characteristics, as well as controls for the cycle and seasonality (all the quarters in the period 2001-2004 were used). Table 5.6 shows the results (only the coefficients of interest) for the entire sample and for each education (skill) group.

The table is very telling. It shows that the DID coefficient is positive and significant for the entire sample and for all the education groups, but the most educated (although the size is small for the incomplete college group). For example, as result of the reform, the probability of being employed increased by 0.6 percentage points for the whole sample, while this figure is 0.8 for the least skilled and 0.3 for those with unfinished tertiary education. It should be noted that the model was run with different sample choices (e.g. all employed, only those older than 18 years, only the ones working more than 20 hours, etc) and the results were robust. This fact, combined with what seems to be an appropriate choice of treatment and control groups, provide some credence to the results.

Figure 5.7: Employment Trends of Salaried and Self-Employment During Growth periods



Source: ENH- DANE

Table 5.6: Impact of the Labor Reform on Employment

	Entire Sample	Primary Incomplete	Primary Secondary Incomplete	Secondary Secondary Incomplete	Tertiary Incomplete	College
<i>A- All employed. Treatment Group: Private Salaried</i>						
<i>DID</i>	0.0059	0.0080	0.0052	0.0050	0.0041	0.0029
<i>T stat</i>	(10.91)*	(6.34)*	(7.01)*	(6.39)*	(6.47)*	(2.31)

Note: * means significant at least at 10%

Source: Amarante and Arim (2005)

The exercise was also performed for the various age groups and for each gender separately. The results, which are presented in Table 5.7 for the parameter of interest, indicate that the effect of the reform was larger for men than for women (by about 0.1 percentage points). Also, the results point to the effect of the reform being concentrated on young workers (18-29 years) and on those in the 40-49 years group. It is important to note that the largest effect is found for workers between 18-24 years of age (almost 0.8 percentage points of increase in the probability of being employed), which is consistent with the results found above and highlights, once more, the importance of the AC to reactivate employment generation among the young²³.

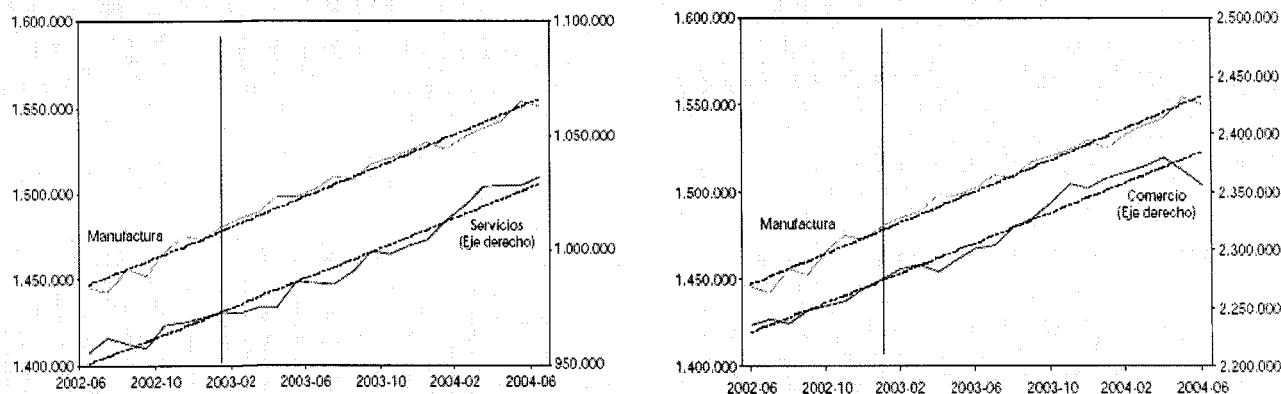
Table 5.7: Impact of the Labor Reform on Employment by Age Group and Gender

	Age							Gender	
	12-17	18-24	25-29	30-39	40-49	50-64	65 and older	men	women
DID	0.0025	0.0075	0.0028	0.0007	0.0020	-0.0001	0.0029	0.0062	0.0051
t-stat	0.87	5.05*	2.11*	1.02	3.54*	-0.19	1.34	11.07*	8.7*
* means significant at least at 10%									

Source: Authors' calculations

In the last exercise, the treatment and control groups were switched to commerce and services and manufacturing, respectively, and the outcome variable was defined to be the employment status of the individual (as opposed to the probability of being employed as in the previous exercise). Figure 5.8 shows the evolution of employment in services (left) and commerce (right) vs. manufacturing in the last two years. From the figures it is evident that there do not seem to be important differences in the way employment has evolved in those sectors compared to manufacturing. In all cases, employment grew in an important fashion at an approximate similar rate (i.e. the slopes are very similar).

Figures 5.8: Employment Trends in Services and Commerce vs. Manufacturing, 2002-2004



Note: the vertical line shows the approximate time of enforcement of the labor reform.

Source: Gaviria(2005)

²³ These exercises used different controls for the cycle and different sample sizes, producing almost the same results in all specifications.

Table 5.8 shows the results of the estimation of the DID model, which clearly indicates that there is no evidence of differentiated impacts on employment generation by sector of activity, which is particularly true in the case of the services sector.

Table 5.8: Impact of the Labor Reform on Employment by Sector of Activity

	Services	Commerce
DID	0.0001	0.0025
t-stat	0.19	1.13
* means significant at least at 10%		
The comparison periods are 2004-2003 vs 2002 (2nd quarter)		
The estimation includes controls for personal characteristics		

Source: Gaviria(2005)

Also, instrumental variables regressions were run (reported in some detail in Chapter III) to investigate the effect of firing costs on unemployment (the instrumented variable was the participation rate, for methodological details see Box 3.5). To do this, the methodology proposed by Heckman and Pagés (2004) for measuring firing costs was applied, finding that the changes introduced by the 2002 labor reform were translated into a reduction of about 1.8 percentage points (of the payroll) of firing costs (1.2 percentage points for low earners and 2.8 for high ones)²⁴. The regressions were run in first differences as almost all the series were integrated of order one and included GDP, the minimum wage, participation rates and average wages as additional right side variables. Results are shown, for the parameter of interest, in Table 5.9 for the entire sample and for each skill group.

Table 5.9: Impact of Firing Costs on Unemployment, 1984-2004

	All	Primary	Sec. Inc.	Secondary	Tert. Inc.	College
Coeff. on Firing Costs	0.35	-0.01	0.15	0.55	0.97	0.24
t-stat	1.68*	-0.03	0.60	1.67*	2.43*	1.08
* means significant at least at 10%						

Source: Authors' calculations

The coefficients in the table indicate that firing costs affect employment for the whole population and for those with intermediate skills (secondary completed and unfinished college), although the effect is stronger (i.e. significant at less than 1%) for those with unfinished college education. In particular, the coefficients indicate that a 1% increase of firing costs reduces unemployment by 0.35% for the entire population, while the decline among those with a high school degree and unfinished college is of 0.55% and 0.97% (i.e. almost one for one), respectively. Thus, the reduction of firing costs resulting from the reform may have reduced unemployment almost 0.7 points ($0.7=1.8 \times 0.35$), while among those with unfinished college this reduction would have been in the order of 2.8 points since these workers are high earners (the total decline of the unemployment rate

$$JS = \sum_{t=1}^T \beta^t \delta^{t-1} (1 - \delta) \left(\frac{y_t}{12 \times t} \right)$$

²⁴ Firing costs are estimated using the expression $JS = \sum_{t=1}^T \beta^t \delta^{t-1} (1 - \delta) \left(\frac{y_t}{12 \times t} \right)$, where JS stands for firing costs, T is the maximum tenure of an average worker, β is a discount factor, δ is the probability of remaining in employment and y is the number of wages paid to an average worker because of dismissal (see Gaviria, 2005 for more details).

among these workers in 2002-04 is around 4 percentage points, from 24 to 20%). Considering that unemployment is highest among these intermediately skilled groups, this is a particularly positive finding. Note, however, that this measure does not impact the less skilled.

The final econometric exercise related to the aspect of employment/unemployment has to do with a very common claim regarding the impact of the reform, discussed briefly above. Indeed, it has been argued that, at least in the short run, unemployment may increase because of the reform, among other things, because firms take advantage of the new legislation to fire workers that remained in their jobs only due to high firing costs. To test the validity of this assertion a DID model was estimated in two stages. First, a Probit model based on the usual personal and household characteristics was fitted to estimate the probability of being unemployed for the entire population. Then, this variable was used to estimate the impact of the reform using as the treatment group the unemployed who came from the salaried private sector (the one for which the reform is expected to impact) and those coming from self-employment, the control. No significant coefficient was found in any of the specifications (and the signs are negative in any case).

This sub-section ends with a brief analysis of the firm survey, which, as mentioned, contained specific questions about the reform (see Gaviria, 2005 for a complete description of the survey, including the questionnaire). The first important point is that 17% of the surveyed firms reported having increased employment in 2002, when compared to 2001 (an average of 18 persons), while this number increased to 27% in 2003, compared to 2002 (with an average of 24 workers). These figures confirm the dynamism of employment generation in 2003. Among the 27% reported to have increased employment in 2003, 4.5% said that one of the determinants had been the new provisions included in the labor reform. These firms increased their number of workers, on average, by 11 workers. As expected, the reason firms attribute most for the increase in employment is the rise of product demand and the expectation that it will continue increasing. Among the new provisions of the reform, those firms which said that the reform was one of the reasons for increased employment mention, by far, the increase of the diurnal shift (100%) as the instrument used the most. Additionally, 21% of the firms said that they would increase employment in the six months following the survey, of which 4% said that this was due, among other things, to the reform. All of them, again, said that the main incentive was the increase of the diurnal shift.

In order to characterize the firms that cite the labor reform as one of the drivers for increased employment, a brief analysis was made. The vast majority (85%) is either a small or medium firm, lending some support to the choice of treatment groups in some of the exercises above. Also, 64% of them report that they do not export any portion of their production. Interestingly, those firms report an 18% average growth in sales in 2003, while the rest grew only 10%. However, if the sample is restricted to only those that report increasing sales, those who cite the reform grow at 26%, while the rest do at 24%.

Therefore, it can be concluded that most of the econometric evidence points to a statistically significant and positive impact of the reform of moderate size on employment generation, which is consistent with observed labor market trends and with the findings

of, for example, López (2004) and IMF (2005). However, the fact that only 4.5% of the firms which increased employment cite the reform as a determinant of the increase would seem to indicate substantially smaller impacts in this respect. It is difficult to reconcile these two pieces of evidence. It might be suggestive, on one hand, of the difficulty of identification of the true impact of the reform on the part of the entrepreneurs, since the timing of the resuming of economic growth coincided with the reform's implementation. Also, it may indicate that, given the many and significant constraints faced by the labor market to increase the pace of employment generation that were reviewed in detail in the preceding chapters (e.g. high non-wage costs, minimum wages, increasing participation rates, adjustment relying mainly on quantities, etc), the room to affect employment through the type of measures included in the labor reform may have declined considerably since 1997/8. Finally and, as mentioned by some firm managers, it may suggest that the cost reductions and additional flexibility brought about by the reform may have not been particularly large, except for the one introduced by the AC reform.

Wages: another outcome that can be affected by the labor reform is the level of remunerations. In particular, theoretically it is possible that wages change due to these type of measures, although the direction of the effect is uncertain. The literature basically foresees two scenarios. First, the reduction of labor costs brought about by the reform impacts wage levels negatively, when wages are measured as the total compensation (i.e. including all payments) received by workers. Second the reduction of labor costs (especially severance payments) is reflected in productivity gains throughout the economy (because technology adoption and adjustment to changing economic conditions are favored—see next chapter), which is eventually transmitted to wages, causing them to rise. It is important to note that this is a sustainable increase because it is based on actual growth of labor productivity. Thus, to analyze this effect a DID model was estimated with the outcome variable defined as the wage rate of each individual in the sample. Two treatment and control groups were defined alternatively. First, the treatment group was defined as the set of salaried workers while the self-employed constitute the control. In the second, the treatment is the non-manufacturing sector while manufacturing is the control (in both cases two alternative sample definitions, which are specified in the table below, were used as well). This last definition, however, does not appear to be particularly correct because, in the case of wages, there is no reason to think that the reform had effects close to zero in the manufacturing sector. Thus, this exercise is better interpreted as a useful, rigorous comparison among sectors of the effects of the reform on wage levels, than as evidence of the impact of the reform. Table 5.10 presents the results of the estimation for the DID parameters.

The results indicate a positive impact of the reform on wages, which is especially important, both in terms of the size of the coefficients and the statistical significance, when the restricted sample (panel B) is used. Also, the estimated coefficients seem to point to a more marked impact on the wages of the less skilled workers. Panel C, on the other hand, shows that, as a result of the reform, wages increased more in the manufacturing sector (the control group) than in the rest of sectors. An additional exercise (not shown), which compared large firms against small and medium firms indicated that the reform appeared to have a negative impact on the wages of workers employed in small and medium firms vis-à-vis those employed in large ones.

Table 5.10: Impact of the Labor Reform on Wages

	All	Primary Incomplete	Primary	Secondary Incomplete	Secondary	Incomplete College	College
<i>A- All employed. Treatment: Private salaried workers</i>							
<i>DID</i>	0.02	0.014	0.021	0.018	0.046	0.023	0.054
<i>T stat</i>	(3.30)*	-0.68	-1.39	-1.42	(4.07)*	-1.07	(2.83)*
<i>B- Restricted sample (SW plus SE). Treatment: Private Salaried workers</i>							
<i>DID</i>	0.243	0.31	0.279	0.246	0.258	0.147	0.155
<i>T stat</i>	(60.17)*	(24.97)*	(29.21)*	(30.74)*	(35.58)*	(10.05)*	(10.04)*
<i>C- All employed. Treatment: non-manufacturing workers</i>							
<i>DID</i>	-0.019	0.007	-0.033	-0.06	-0.017	0.014	-0.037
<i>T stat</i>	(2.12)*	-0.24	-1.56	(3.43)*	-1.12	-0.45	-1.11
<i>D- Restricted sample (only private salaried). Treatment: Non-manufacturing workers</i>							
<i>DID</i>	-0.01	0.022	-0.044	-0.04	0.008	-0.019	-0.004
<i>T stat</i>	-1.14	-0.6	(1.99)*	(2.35)*	-0.62	-0.66	-0.11

* means significant at least at 10%

Source: Amarante y Arim (2005)

Unemployment insurance (UI): undoubtedly, the introduction of an UI scheme was one of the most important innovations of the reform, which becomes particularly important taking into account the fact that unemployment seems to have stabilized at a higher level in the last few years. The objective of the instrument, of course, is to offer some sort of protection to the most vulnerable against the devastating effects of unemployment (in fact, the instrument mitigates the effects of the risk, once it has already been realized). It offers 1.5 minimum wages divided in six equal payments to people who lost employment. Eligible individuals are concentrated mostly in household heads with children under 18 who do not have other sources of income. As mentioned in Box 5.1 the UI is financed through an additional one percent payroll tax managed by the CCFs. In fact, these institutions are in charge of not only managing the money, but also of administering the system and actually providing the benefit. An important point is that the instrument, as defined in the law and in the ensuing reglament, gives preference to unemployed individuals with previous affiliation to the CCFs, i.e. to formal workers (only a small portion of the resources go to people without such characteristic). The UI is complemented by a mandated training program for the unemployed under the CCFs.

Notwithstanding the importance of the instrument, from the start there have been operational problems in its implementation. It only started to function in October 2003 due to complications with the fund that finances the benefit. By June 2004 only 69% of the available resources for UI had been used, while the figure for the training programs was 36%. Since then, however, execution of the program improved and 83,700 subsidies were given in the period October 2003-December 2004, totaling 32,500 million pesos (about \$13.6 million). This number of subsidies represents about 7% of the number of unemployed in the seven main cities in December 2003 and about 3.4% of the total pool of unemployed in the country. If the proportion is taken using only unskilled workers (with less than high school education) these figures increase to 18 and 9.5%, respectively. These take-up rates compare favorably to the initial execution of similar programs in other countries, such as Brazil. The operational problems have been related mainly to the difficulty and excessive number of requirements for the unemployed to benefit from the program and the constraints provided by insufficient data sources to check the validity of the claims and to avoid fraudulent use of the instrument (e.g. "double dipping").

However, a deeper problem arises from the very design of the instrument. The fact that preference is given to individuals with previous affiliation to the CCFs raises the

following two conflictive situations: (i) since the enactment of the system it is a fact that demand for UI benefits has been substantially higher from individuals with no previous affiliation, as was to be expected. Indeed, the number of requests coming from the former group was double that coming from those with previous affiliation in 2004, however from the 83,700 subsidies only 22,000 (26%) were given to people with no previous affiliation. Thus, it seems that, because of operational constraints (it is more difficult to avoid fraud if the subsidy is given to individuals with no previous affiliation), there is in effect a substantial rationing of the benefit precisely to the group of people that needs it the most; and (ii) related to this last point, the people with no previous affiliation are likely to be more vulnerable than the rest because they come mostly from employment in the informal sector. Also, the fact that the majority of the unemployed were employed in the informal sector (83% in 2004) poses a serious question about the appropriateness of this regulation. Thus, this seems to be an issue that deserves careful analysis and in all likelihood, refinements to the instrument could be introduced.

Waiver of “Parafiscales” for different reasons: as mentioned in Box 5.1, there are two important new provisions in the reform that attempt to serve two purposes (besides the AC). First, to improve access conditions for hard-to-employ groups (HEG) to the labor market. Second, to introduce some degree of flexibilization to the structure of non-wage costs. These new provisions are (i) the exemption of “parafiscales” for firms that hire poor heads of households, ex-convicts, disabled individuals and persons between 18-25 years of age or older than 50²⁵; and (ii) the possibility of firms requesting a refund of half of the SENA contributions if they provide training to unskilled workers on-site (funded by the firm). These measures were viewed as very important and innovative in the sense that they would contribute to easing one of the heaviest burdens carried by the productive sector, at the same time that it would help vulnerable groups and introduce more competition into a complicated market, such as training.

However, both the administrative data and the firm survey indicate that the results have been substantially below expectations, although the government, supported by the Bank and the IDB, has taken important measures to overcome this situation. With regards to the parafiscales exemption for HEG, administrative data indicate that around 120 employment positions were created as a direct result of the measure (that is, the MPS has registered around 120 workers for which the exemption has actually been carried out). In the firm survey only two firms report having used the instrument to hire young workers between the ages of 18 and 25. When asked why they had not used the instrument, the vast majority answered either that they did not know it existed, or that the subsidy is too small for the hassle, including having to hire special types of people who are maybe not required. However, it is highly likely that there is a deeper reason behind this result, related to a conflict of interest faced by the CCFs in charge of managing the system. In particular, since they are funded with parafiscales, it is not clear why they are willing to try to ensure that the subsidy (which takes money away from them) is sufficiently disseminated and administered effectively. Based on these considerations, the government, again with the support of the Bank, has launched the PADE program (see

²⁵ In the case of poor household heads (belonging to Sisbén levels 1 or 2) the subsidy changes from the exemption of Parafiscales to a direct cash subsidy. This is known as the PADE program.

footnote 23), which is supposed to give 40,000 subsidies, but it has been difficult to get the program started because of many operational problems, both on the side of the government and the Bank (there are about 33,000 million pesos -\$14 million- available).

The other new instrument (parafiscales refund for on-site training, contained in Article 38 of the reform) also shows poor results. Administrative data until October 2004 indicated that an extremely low number of refunds had actually been made, a fact confirmed by the firm survey. In effect, this survey indicated that almost 60% of the firms carried out some training in 2003, but only 7% of them financed it through refund of parafiscales (figure which is actually better than the administrative data provided by SENA). The average percentage of the cost of the course that was financed using this benefit was 48%, which is very close to the 50% established in the law. When the firms were asked why did they not use the benefit to deduct part of the parafiscales, most of them answered that they had no knowledge of the possibility or that SENA had not approved the refund (in a smaller percentage, around 11%). Also, when asked why did they not carry out training courses, about 80% said they did not need them and about 10% said they did not know of the possibility of obtaining the refund. Thus, it seems quite clear that in this case there are very similar problems to those encountered in the exemption of parafiscales, namely insufficient dissemination of the instrument and a very clear conflict of interest on the part of SENA, in charge of approving the refunds, which is subtracting resources directly to themselves. In this context, the government took a very positive step by issuing the CONPES document number 081, in which a clear separation of functions in the national training system was defined. Within the new structure, the regulation responsibilities go to the MPS and SENA becomes only a provider (and financer in some cases) of training services. Also, the CONPES re-assigns the function of accreditation of training programs to the MSP. This accreditation is a pre-requisite to participation in the program outlined by Article 38, thus removing the potential conflict of interest under the current implementation arrangements. However, the CONPES contains very specific recommendations in terms of timing and activities that should be followed closely to ensure that they are actually carried out. Also, it is important that the activities proposed (by SENA and MPS) in terms of disseminating this important instrument are underway²⁶.

²⁶ There are other new provisions in the reform related to social protection or to direct incentives to generate employment, such as the micro credit program or some training programs for the unemployed (briefly mentioned above). The reader is referred to Comisión de Seguimiento a las Políticas de Generación de Empleo (2005) or World Bank (2004) for an evaluation of these.

6. PRODUCTIVITY AND COMPETITIVENESS: TRENDS AND DETERMINANTS²⁷

SUMMARY

This chapter estimates the evolution of labor and total factor productivity and investigates its determinants, emphasizing those related to labor market regulations and functioning. The findings are disappointing: both labor and total factor productivity have been declining, impacting negatively economic growth. This performance is especially negative when comparing to other LAC countries during the 1990s. Unfortunately, poor performance of productivity growth is highly correlated with sluggish growth of salaried employment and wages. Poor performance of productivity growth, at the aggregate level, seems to be related to education (maybe in terms of quality), high and binding firing costs, increasing participation of the state in the economy (approximated by the level of public spending) and by the intensification of the armed conflict. Also, it was found that a higher level of exposure to international markets has impacted productivity growth positively. Within manufacturing, the most important determinants are related to the level and evolution of non-wage costs (negative) and to the degree of technological adoption (positive). Qualitative work with the productive sector confirmed some of the main findings and, additionally, pointed out two important facts: that the productive chains may be negatively affected by excessive protection to the first link and, given this, that they may be serving the role of hiding unproductive links

During the 1990s, growth of GDP per capita in the LAC improved considerably, averaging 2.05 % for the decade, up from the 1980s' poor regional average of -0.74% (Table 6.1). Loayza, Fajnzylber and Calderon (2002), assess the economic growth results of the region for the period between 1960 and 1999. They decompose per capita GDP series into trend and cyclical components and show that during the 1990s most countries in the region experienced a decline in GDP cyclical volatility²⁸, which had been high during the 1980s. Estimates of cyclical persistence for LAC²⁹, show that persistence in output per capita fluctuations for the region increased in the 1990s relative to the 1980s. These facts, along with the acceleration of the region's trend growth of per capita GDP during the 1990s, which had been declining since the 1960s, suggest that growth improvement in LAC cannot be attributed solely to cyclical factors.

Table 6.1. GDP Growth Rates per Capita in Colombia, LAC and world, 1961-1999.

	1961-70	1971-80	1981-90	1991-99
Colombia	2.21%	3.05%	1.26%	0.72%
Andean Region*	1.51%	2.09%	-1.18%	0.77%
LAC**	2.71%	3.44%	-0.74%	2.05%
World***	4.15%	2.68%	2.29%	1.72%

Source: Loayza, Fajnzylber, Calderon (2002).

*Simple average, own calculations **Weighted average, n = 26. For 2000-02, weighted average, n = 22

*** Weighted average, n = 109. For 2000-02, weighted average, n = 103

²⁷ Two papers were commissioned: Gracia and Santamaría (2004) and Echeverry and Hernández (2005).

²⁸ Cyclical volatility here is measured as the standard deviation of a band pass filtered logarithm of per capita GDP.

²⁹ The coefficient measures the time that takes for the deviations from the trend to return to equilibrium.

Until the 1980s, Colombia's GDP evolved similarly to the region's median³⁰. But despite its solid performance during the 1980s, when it was one of the few LAC countries registering positive growth rates, in the 1990s Colombia's growth rates decreased, in clear contrast with the rest of the region. What is more, Colombia registered an increase in cyclical volatility and a decrease in the growth rate of trend output per capita compared with the 1980s. What lies behind the evolution of Colombia's growth rates over the last 4 decades? Considering that productivity largely determines GDP growth, can changes in productivity components -- that is, changes in capital, labor, or Total Factor Productivity (TFP) -- explain the fact that the country's growth trends during the 1980s and 1990s were so different from those observed in the rest of the region?

To help answer these questions, the present chapter explores the evolution of labor and total factor productivity in Colombia and assesses the extent to which these two factors were behind the country's solid performance during the 1980s, as well as its disappointing growth rates of the last decade. The evidence shows that both TFP and labor productivity performed very poorly during the last two decades, particularly in the 1990s. While the poor rate of labor productivity displayed by Colombia appears to have affected the evolution of total factor productivity, evidence suggests that the persistent low productivity growth, in turn, explains to a large extent the country's poor GDP performance.

The chapter is organized as follows. The first and second sections present an analysis of the evolution of Colombia's TFP and Labor Productivity, respectively, and their determinants. The third section presents an overview of the country's competitiveness, placing it in an international framework, so as to benchmark Colombia's performance. The results of qualitative work carried out with the productive sector are also included. The final section summarizes the main findings.

- Total Factor Productivity

Growth in TFP is traditionally measured as the increase of real output beyond what can be attributed to increases in the quantities of labor and capital employed. TFP measurements reflect technical change, economies of scale, efficiency change, variations in capacity utilization and measurement errors for the latter. Gracia and Santamaría (2004) use a Solow-type growth accounting method proposed by Loayza, Fajnzylber and Calderón to determine the extent to which recent growth patterns in Colombia can be attributed to a cyclical up-turn or to changes in TFP growth, and compare results obtained to those obtained for LAC by Loayza, Fajnzylber and Calderon.

The study uses three methods to decompose growth rates, in all of which TFP is the residual after capital and labor inputs have been accounted for. The contributions to growth of labor and capital are determined by their growth rates, multiplied by their income share. Method 1 assumes that capital growth is investment minus depreciation, and labor growth is only the growth of the labor force. Method 2 incorporates an adjustment for human capital, which is an index of the educational attainment of the labor

³⁰ Median country by decade selected on the basis of the annual rate of GDP growth in each decade. For 1961-70, Peru; 1971-80, Honduras; 1981-90, Brazil; and 1991-2000, Mexico.

force. The third method adds adjustments for factor utilization of capital and labor. These adjustments are the rate of labor employment, as a measure of capital utilization, and labor growth adjusted by the population actually employed and total hours worked, as a measure of labor utilization.

Table 6.2 and Figure 6.1 present the results of growth decompositions performed with method 1 during the last four decades. As they illustrate, the median LAC country saw the TFP contribution decline during the first three of the analyzed decades, in particular during the 1980s. The trend changed during the 1990s, when most of LAC countries experienced a significant recovery. Colombia's TFP growth trend was similar to that of the region during the 1960s and 1970s, registering TFP contribution to GDP growth rates slightly higher than the sample's median countries for these two decades (Figure 6.2). Though Colombia's TFP also declined during the 1980s, the country was one of only two in the region not to have negative TFP rates and performed considerably better than most of LAC, including Brazil, the 1980s' median country. This solid performance did not continue during the 1990s, when, despite recovery across the region, Colombia's TFP actually shrank, with TFP contracting 0.29% per year.

Table 6.2: TFP1 Contribution to Growth for Selected LAC Countries (average yearly rate)

	1961-70	1971-80	1981-90	91-2000
Argentina	0.96	0.24	-2.43	3.05
Brazil*	1.88	3.11	-1.43	0.41
Chile	1.24	1.09	1.62	2.81
Colombia	1.77	1.68	0.02	-0.29
Honduras*	0.97	1.04	-0.98	-0.89
Mexico*	1.66	1.25	-1.84	0.42
Paraguay	1.9	5.27	-0.5	-1.12
Peru*	1.72	0.04	-3.42	1.55
Uruguay	0.79	1.75	-0.54	1.85
Venezuela	1.97	-2.64	-1.58	-0.18
Mean	1.54	1.31	-1.12	0.94

Source: Loayza, Fajnzylber, Calderon (2002). *Median country by decade

Similar trends were obtained for the region when using methods 2 and 3. For Colombia, though, sizeable fluctuations can be observed in the evolution of TFP between the 1960s and the 1990s with these methods. For instance, results obtained with method 2 (Figure 6.3) show lower TFP growth rates for the 1970s, 1980s, and 1990s, than those presented in Figure 6.2, while the contribution of labor to growth increased for the same decades. No changes were observed in the contribution of capital to growth. This result is probably related to the fact that educational achievement increased significantly during the period, so accounting for the quality of labor increases the growth attributed to labor, while lowering that attributed to TFP.

A very different picture can be observed in Figure 6.4. While the level of the contribution of labor to GDP is considerably larger for the 1970s and 1980s than that obtained with the other two methods, TFP growth significantly contracts during this period, and expands in the 1990s. These results reflect the fact that during recessions, adjustments for

factor utilization have the effect of reducing the measured growth in the services provided by labor and capital, thus increasing measured TFP growth, while during recoveries the opposite occurs. From the overall picture that emerges from the results obtained with the three methods, Gracia and Santamaría conclude that the evolution of TFP during the 1990s is to a large extent responsible for the decline observed in Colombia's GDP³¹.

Figure 6.1: Simple Growth Decomposition, 1961-2000. Median countries by decade.

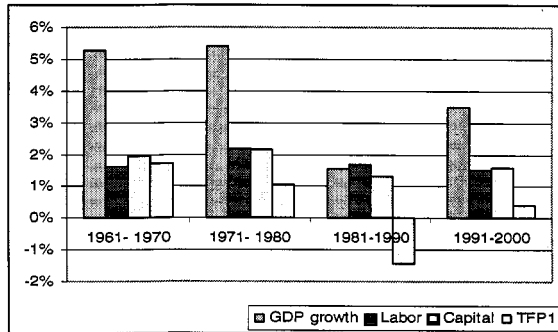


Figure 6.2: Growth Decomposition, 1961-2000 for Colombia. Method 1.

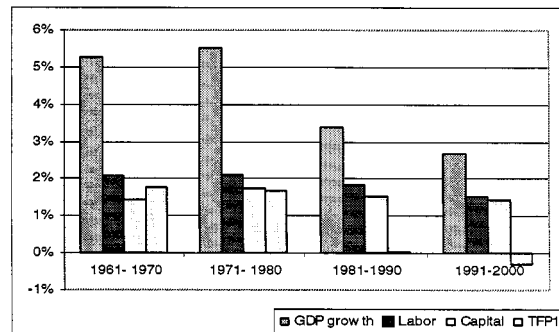


Figure 6.3: Growth Decomposition, 1961-2000 for Colombia. Method 2.

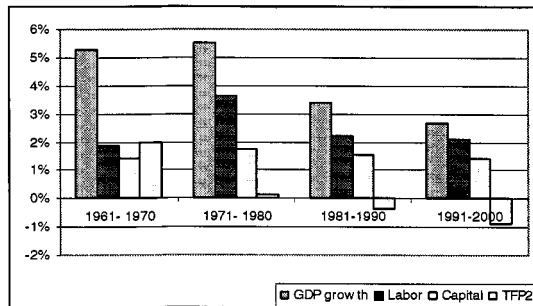
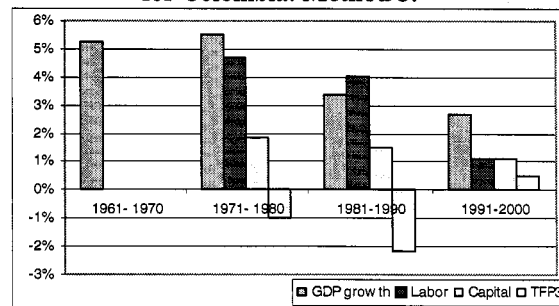


Figure 6.4: Growth Decomposition, 1971-2000 for Colombia. Method 3.

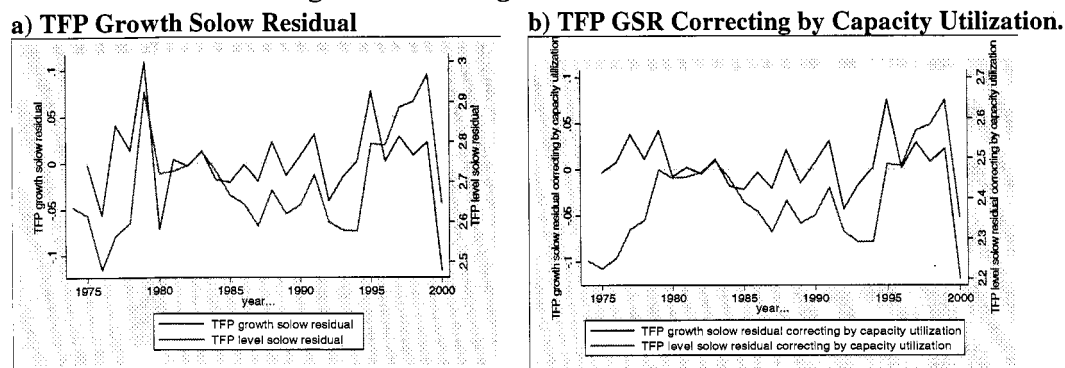


Source: Loayza, Fajnzylber, Calderon (2002).

TFP estimates were also obtained for the manufacturing sector using four digits ISIC panel data. Results are depicted in Figure 6.5 (a) and (b) highlight the sharp TFP drop in 1980, as well as the posterior stagnation that characterized that decade. A vigorous recovery can be observed for the first half of the 1990s, followed by yet another abrupt reversal. This result is robust to the three ways of obtaining the TFP estimates.

³¹ See Appendix 1 in Gracia and Santamaría (2004) for a summary of the methodological aspects of these results.

Figure 6.5: Average TFP estimates 4 ISIC



Source: Gracia and Santamaría (2004).

Several studies have attempted to establish the determinants behind the persistent low productivity growth witnessed in Colombia in the 1990s³². A number of studies emphasize the role of the debt crisis and the reduction in foreign capital during the 1980s, along with the effect of fiscal mismanagement of the 1990s. Another prevalent explanation in the literature attributes poor economic performance to the implementation of structural reforms –or the lack of them. Cárdenas (2002) points out that the downturn in GDP growth after 1979 should be attributed to the evolution of TFP, since it cannot be explained by human and physical capital accumulation, which registered increasing trends during the period. Cárdenas concludes that the increase in crime, the expansion of drug-trafficking activities, and the strengthening of the insurgent movements, are the main reasons behind such a reversal in productivity growth.

Gracia and Santamaría examined the extent to which public policies and institutions, as well as the country's high levels of conflict and crime, affect Colombia's TFP performance. They divided major categories of public policies into structural and stabilization policies and analyzed the role played by policies directed to growth, trying to identify which ones had a long run impact and which ones were behind cyclical fluctuations. In terms of *Structural Policies*, areas analyzed include:

-Trade Openness: a number of studies have highlighted the relevance of trade openness to explain the aggregate TFP contribution to growth³³. International trade can: i) trigger higher specialization levels following countries increased focus on their comparative advantages; ii) promote economies of scale, which in turn can expand potential markets; iii) boost productivity by increasing the imports-exports flows, in turn accelerating the entry and exit rate of firms; iv) raise foreign direct investment (FDI) and accelerate the rate of technology adoption. The indicators for trade openness used here include: ratio of exports to GDP, imports to GDP, FDI to GDP, an index for trade openness³⁴, real exchange index, and exports plus imports to GDP.

³² For a complete survey, see Echeverry and Hernández (2005).

³³ Perilla, Castro and Gracia (2004); Núñez J., Rodríguez J. and Sánchez F. (1996); Clavijo (2003) and Cárdenas (2002)

³⁴ The index measure imports liberalization, that is, the percentage of imports that are in the list of goods and services free of restriction or quotas. Clavijo (2003).

-Education: not only does education complement factors of production such as physical capital and natural resources, and smooth technological adoption and imitation, but it can also neutralize diminishing returns in the other factors, affecting TFP³⁵. Primary, secondary and university education enrollment rates are used as proxies of the effect of education over TFP.

-Financial Markets: financial depth facilitates risk diversification, identify profitable investment projects, and mobilize resources to make those projects possible. Credit to GDP ratio is used to capture this concept.

-Public Services and Infrastructure Availability: though considered public goods, to a certain extent public services and infrastructure are inputs of the production function, and so affect TFP. Indicators used include installed telephone lines per 100 thousand people, kilometers of roads, and capacity of electricity generation.

-Government Burden: despite playing a crucial role, government's tax collection may represent a drain for private activity, particularly if tax money is used to finance inefficient and socially unprofitable projects, or if it crowds out private resources to feed excessive bureaucracies. Additionally, an excessive level of public spending may reflect a high burden of an inefficient state that crowds out private investment, reducing productivity growth at the aggregate level. Indicators include income tax revenues to GDP, as well as central government's operational and interest spending to GDP.

Stabilization Policies were also analyzed, as a stable macroeconomic environment can contribute to growth by avoiding unexpected shocks such as financial and balance-of-payments crisis. Low levels of uncertainty allow economic agents to concentrate on productive activities rather than trying to manage high risk and ways to redistribute rents from uncertain outcomes such as high inflation or financial crises. To capture macroeconomic stability, the variables used included central government deficit (or superavit), public sector deficit (i.e. central plus regional government), and public enterprises (excluding public banks and inflation to capture this environment).

The impact of *conflict* is analyzed by its effect on the rate of crime. Conflict has reduced the prosperity of legal activities and increased the profitability of illegal crops and drug trafficking in Colombia. Moreover, a large amount of private and public resources has been allocated to defense and security, reducing the pool of funds available for the development of more profitable projects. The variable used for the regression was homicides per 100 thousand people, which permits the measurement of conflict intensity and the number of offenses to life, liberty, property reported by the National Police³⁶.

Indicators for the *economic cycle* were also included, as the cycle also affects TFP. Three types of indicators were used to analyze to what extent it does: index of capacity utilization, labor force growth rate, and GDP gap. The GDP gap was obtained as the difference between the observed GDP and the trend.

³⁵ Lucas (1988).

³⁶ A weighted average of the three types of crimes was also included.

An important point in this Report is that it recognizes that productivity is the most important determinant of differences in GDP per-capita across countries and, thus, the way that existing labor regulations affect the evolution of productivity becomes an important issue. That is, the preoccupation with productivity, and its link with the labor market, is perhaps at least as important as the other metrics for measuring labor market performance and, also, provides important clues about the functioning of the labor market and the behavior of employment and wages. What is the link between labor market functioning and productivity growth? Inflexible and burdensome labor legislation, especially in the contracting and end of employment stages, may hinder productivity growth because it makes very difficult for the firm to adopt (or develop) new technologies. There are a number of channels through which labor market regulations can affect productivity. The following are particularly important:

- the difficulties that strict hiring and firing regulations impose on the efficient use of the labor input along the business cycle;
- stringent hiring and firing restrictions raise the cost of labor adjustments, which is often required after innovation occurs. That is, those regulations negatively affect technological upgrade because they increase the unavoidable cost of adjusting the labor force once a new technology is adopted in the production process;
- the lack of incentives to be productive that those regulations introduce for workers; and
- the fact that those regulations may discourage training.

Some evidence corroborates this hypothesis. Hopenhayn and Rogerson (1993) find that policies that interfere with the process of job creation and destruction at the firm level are quite costly in terms of productivity and welfare. One of such policies is the imposition of legislated costs to dismissals through severance payments. This tax creates a distortion that encourages firms to use resources less efficiently, with the result that productivity falls. Thus, they stress the importance of these distortions and claim that focusing only on their employment effects is a mistake. Others argue that “institutional taxes”, including firing costs, is the factor that matters in explaining differences in income per capita across countries. This is because these taxes affect the individual return on investments, especially the one on technological adoption. Also, it has been found that firing costs increase the power of inside labor to resist adoption of new technologies. More recent analyses (Scarpetta and Tressel, 2004) investigate the impact of firing costs on productivity in a large sample of countries, finding that the differences in productivity growth across countries (and industries) are explained by institutions and country-specific regulations, via their impact on the incentives to innovate and adopt new technologies. One of the most important among these is the cost of hiring and firing workers. Therefore, this Report directly estimates the impact of stringent labor regulations on the evolution of productivity, both at the aggregate and sectoral level. For this, a firing cost index was included, which scores 12% before 1990 and 7% afterwards³⁷. At the sectoral

³⁷ Heckman and Pages’ methodology was used, where the index is,
$$I = \sum_{t=1}^T \beta^t \delta^{t-1} (1 - \delta) \frac{y_t}{12t}$$
. Here y_t is severance payment, number of wages, when a worker is dismissed with out justified reason. T is the highest time

level, the variable included to approximate the “burden” of labor related regulations is the share of non-wage costs in total remunerations by sector.

Box 6.1: Theoretically, labor restrictions (firing costs) should reduce productivity growth although at present the evidence is sketchy: the literature on the impact on productivity growth is thin at the international level and thinner still in Latin America. Hopenhayn and Rogerson (1993), using a general equilibrium model for job creation and destruction, find that policies that interfere with the natural process of job creation/destruction at the firm level are quite costly in terms of average productivity and, more generally, in terms of aggregate welfare. Parente and Prescott (1991, 2000) argue that TFP differences dominate differences in per capita GDP and that firing costs are one of the policies that increase the power of inside labor in a number of industries to resist changes in work practices and adoption of new technologies. Capelli (2000) and Hopenhayn and Jovanovic (2001-HJ) also show that stringent hiring and firing restrictions raise the cost of labor adjustments, which is often required after innovation occurs. A more recent analysis provided by Scarpetta and Tresselt (2004), using firm OECD data, find a negative impact of firing regulations on productivity and technological via its influence on the incentives to innovate and to adopt new technologies. There is also a yet unexplored potential that poorly designed legislation discourages micro and small enterprises from participating in other formal institutions (e.g., credit, training) and thus capitalize on scale economies and innovation.

These variables were regressed against TFP to capture the effect of structural and stabilization policies (including labor), conflict and the business cycle on productivity. Both the validity of each linear specification and the stationarity of the series were tested. Since most the series were integrated, the regression was run in first differences. In Table 6.A1, which presents results for the regressions in levels, the parameters represent the contribution of each variable to TFP. Index numbers and variables constructed as a ratio to GDP indicate that a change in one percentage point of that ratio would change the TFP level by a number equal to each parameter. In Table 6.A2, results using the growth rates of both the TFP and the variables of interest are presented. Coefficients in this second table must be interpreted as the contribution of each variable to the growth rate of TFP³⁸.

Results for aggregate TFP trends show that the substantial reduction of firing costs that occurred in 1990 in Colombia (brought about by the 1990s labor reform) had a positive effect on the evolution of productivity growth, which actually avoided that the fall of the 1990s were larger. This gives credence to the arguments about the link between productivity and the labor market discussed above. In addition, both trade openness, as measured by the growth rate of imports plus exports, and education, particularly increases in university attainment, were robust and positively contributed to TFP growth. On the other hand, government burden, measured by the level of income taxes (or government spending) to GDP, and violence and crime, estimated by the rate of increase in crimes against liberty, both of which were robust, were the two indicators that most clearly contributed to the contraction of TFP. Results also show that the *cycle*, as measured by the GDP gap and the level of capacity utilization, seems to be responsible for a large fraction of TFP fluctuations.

expend in the company by an employee. β is the discount factor and δ the probability of remaining employed in the plant.

³⁸ See Gracia and Santamaría (2004) for details on the procedure.

The determinants of TFP performance for the manufacturing sector were also estimated using the yearly manufacturing survey at four ISIC digits. As in the case of aggregate TFP, a set of indicators representing labor market institutions, labor market regulations, innovation activities and trade openness were regressed against TFP growth. This estimation was carried out in first differences and using a variety of econometric techniques such as simple OLS, fixed effects, fixed effects with instrumental variables and the Arellano-Bond estimator to account for small sample and endogeneity problems. Indeed, since non-wage costs and foreign trade variables were suspected to be endogenous, they were instrumented in one specification. The maximum rate of TFP growth across sectors by year was included as a separate covariate to control for technological transfers from leading industries to the rest of the manufacturing sector (Bernard and Jones, 1996).

Results obtained show that the business cycle has an important impact on TFP growth. Importantly, when controlling for education, the business cycle, export orientation and industrial concentration, non-wage costs, measured as the ratio of all non-wage payments to total remuneration, have a negative and sizeable influence on TFP growth. Two things are important about this result. First, non-wage costs act as an approximation to the level and strictness of labor regulations faced by each industry due to the lack of more direct information. Second, the increase of non-wage costs after 1995 is responsible for this negative impact. Thus, it would appear that the increasing level of non-wage costs is constraining the adjustment of the labor force, which is important in a time when the economy opened up to more international competition. On the contrary, technology adoption, measured as the share on firms that innovate by sector (see Box 6.2), has a positive impact on TFP growth, as the coefficient is positive and robust. While plant level estimates find that the gradual improvement in TFP can be partially explained by the trade reform³⁹, the coefficients of trade related variables are not statistically significant.

Box 6.2: Innovators vs. Non-innovators in the Manufacturing Sector – What Distinguishes Them?

The purpose of this box is to identify the most relevant differences between Colombian firms that innovate and those that do not innovate. The analysis is carried out using data from the 1997 Encuesta sobre Desarrollo Tecnológico en el Establecimiento Industrial Colombiano, which surveyed 885 firms in 8 regions of the country. The survey classified enterprises into four categories by level of innovation: innovators in a strict sense, innovators in a broad sense, potential innovators, and non-innovators. For the purposes of this box, only innovators in a strict sense are considered innovators, and enterprises in the other three categories are considered non-innovators. Following this last definition, survey data permits the classification of 122 enterprises (or 14 percent) as innovators and the remainder 763 as non-innovators.

A number of characteristics differentiate firms that innovate from those that do not innovate. Among them, firm size stands out. As much as 66% of innovators have over 100 employees, whereas firms with less than 100 employees tend to be non-innovators. It can be observed that 93% of enterprises with up to 50 workers do not innovate, whereas this percentage is 89% for firms with between 50 and 99 employees, 88% for those with 100 to 199 employees, and 75% for those with more than 200 employees. Another prominent difference between innovators and non-innovators is the level qualification of their work force. The survey shows that innovators have a higher concentration of skilled labor. On average, the share of workers with a graduate degree is 80% higher in firms that innovate than in those that do not. Firms that innovate have 45% professional employees and 24% technical experts more than their non-innovator counterparts. Firms that do not innovate, on the other hand, have a concentration of unskilled labor 8% higher than that of enterprises that innovate.

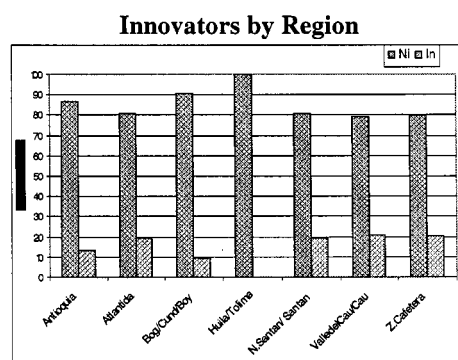
³⁹ Meléndez et. al. (2003)

Innovators and non-innovators also differ in the average age of their operations. Since the 70% of sampled firms were established between 1960 and 1990, it is not surprising that the largest share of both innovators and non-innovators (62 and 28%, respectively) is found among firms that were established in this period. When comparisons are made within decades though, firms 20 to 40 years old have average to low innovation rates, whereas firms created in the 1910s and the 1990s have a higher concentration of innovators in their ranks, with 33 and 23%. The groups that have the largest proportion of non-innovators are those of companies created in the 1920s (92%) and 1970s (90%). In addition, firms that innovate tend to have a larger volume of total sales per year than their non-innovators counterparts. Innovators also have a larger share of exports as a percentage of total sales than non-innovators.

On average, innovators tend to invest proportionately more on machinery and equipment than non-innovators. Similarly, and not surprisingly, firms that innovate carry out proportionately more research and development, innovating activities, and technical training than firms that do not innovate. When analyzing characteristics by sector, the survey shows that enterprises that produce edible goods, chemical products, china and porcelain objects, and non-electric machinery are among those who innovate the most. All firms in the sample that produce petroleum byproducts are net innovators, while those in textiles and non-metallic furniture do not innovate at all.

The figure below shows the distribution of innovators and non-innovators by geographical location. Though the Bogotá/Cundinamarca/Boyacá region accounts for 41% of the firms in the survey and 28% of all innovators, within the region, only 10% are innovators. On the other hand, in the region of Valle del Cauca/ Cauca, which houses 15% of surveyed firms and 23% of all innovators, as many as 21% of the region's firms innovate. Other regions with large percentages of innovators are Costa Atlántica, Northern Santander and Santander, and the Zona Cafetera, where approximately 20% of firms are innovators. The region comprising Huila and Tolima, with the smallest number of surveyed firms (2%), does not have any innovator.

As an important point, 40% of the non-innovators cited labor regulations and the difficulties to adjust staff as one of the main reasons to not innovate. The factor most commonly cited was the scarcity of skilled personnel.



Source: Authors' Calculations

A probabilistic (logit) model was estimated to determine what factors and firm characteristics affect the probability that Colombian firms innovate. The results show that the characteristics that have the largest impact on the probability to innovate are firm size, export orientation, level of qualification of employees, and salaries as a percentage of production. Surprisingly, the level of investment on machinery and equipment and the age of the firm do not seem to considerably affect the probability to innovate.

The findings presented in this section are in line with those of a number of theoretical and empirical studies, except those of external trade variables, which conclude that human capital improvements, and trade liberalization had a positive impact in the evolution of Colombian TFP at the aggregate level. However, most of them find that the gains

obtained thanks to these factors were offset by the increasing rates of crime and the rising government burden. The findings of this Report underscore the relevance of labor related regulations, which had not previously been analyzed and are in line with recent literature (see for example, Hopenhayn and Rogerson, 1991). Also, cyclical factors, which seem to account for a considerable portion of TFP variation are important. Gracia and Santamaría argue that the negative performance of the country's TFP growth may also be explained by the poor evolution of Colombia's labor productivity.

- Labor Productivity

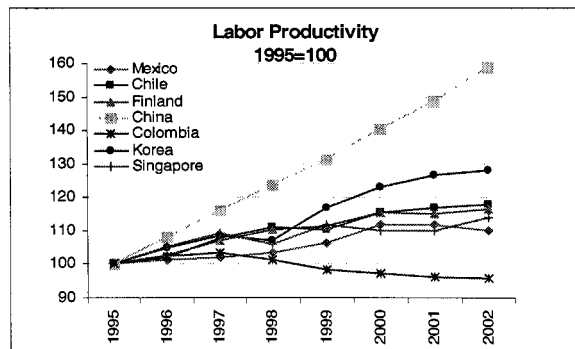
Labor productivity measures units of output generated by each unit of labor, taking into consideration changes in individual characteristics of the workforce, capital, intermediate inputs, as well as technical, organizational and efficiency factors. During the 1990s, trends in labor productivity were even more disappointing than the observed for TFP (Figure 6.6). Table 6.3 compares labor productivity growth for some Latin American countries along with Korea, Singapore and Canada for 1990-96 and 1990-99. At the aggregate level, Colombia is by far the worst performer of the sampled countries, being the only country to register a contraction in labor productivity growth during the 1990s. In terms of industrial labor productivity, the country outperforms only Brazil and Canada, but is still considerably below the LAC average (3.2%). The fact that industrial labor productivity grew at 1.8%, while at the aggregate labor productivity contracted by 1.4%, highlights the sluggish (if not negative) productivity growth in other sectors.

Table 6.3: Labor Productivity Growth during the 1990s⁴⁰

	Aggregate		Industrial	
	90-96	90-99	90-96	90-99
Singapore	5.6%	4.5%	8.6%	7.5%
Korea	5.0%	4.6%	7.1%	7.8%
Chile	5.1%	4.4%	4.0%	4.2%
Argentina	4.4%	3.2%	8.0%	5.4%
Uruguay	2.7%	2.4%	3.0%	3.1%
Colombia	-2.1%	-1.4%	0.4%	1.8%
Peru	0.6%	0.4%	4.5%	4.6%
Brasil	0.2%	0.3%	2.0%	1.5%
Mexico	-0.3%	0.6%	2.8%	2.0%
U.S.			4.7%	5.8%
Canada			1.6%	1.7%
Mean-all	2.6%	1.9%	4.2%	4.0%
Mean-LA	1.8%	1.6%	3.5%	3.2%

Source: WDI and U.S. D. of Labor in Gracia and Santamaría (2005) Source: WDI and GRECO Colombia Gracia and Santamaría (2005)

Figure 6.6: Labor Productivity



The evolution of quarterly labor productivity, measured as the proportion of GDP to employment, was analyzed for Colombia's seven main cities using data for the period 1984-2003. Figure 6.7 presents the results. It can be observed that following a long period of stagnation, labor productivity recuperated vigorously during the 1990's (1993-96). Nevertheless, and despite the recovery, by the end of the period the index was considerably below the levels recorded in the early 1980's.

⁴⁰ GDP Constant prices local unit currency over employment figures from ILO.

Figure 6.7: Aggregate Labor Productivity



Source: Gracia y Santamaría (2004)

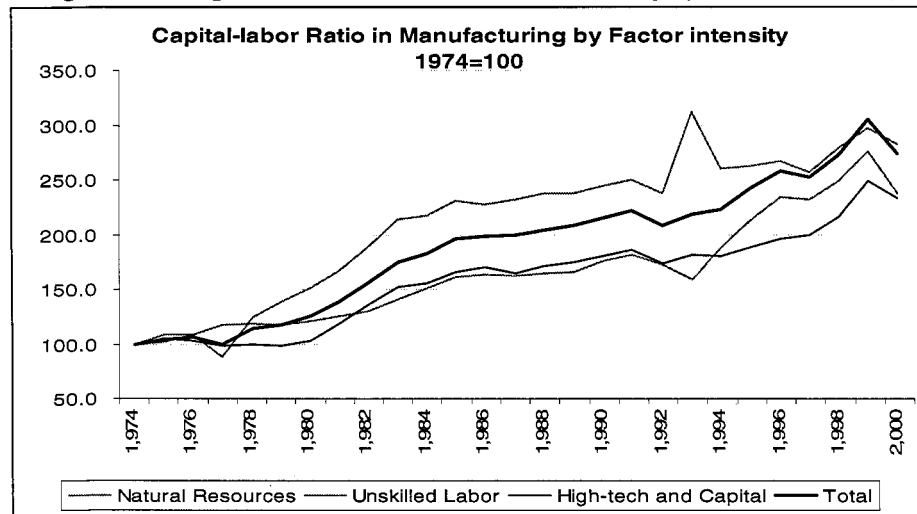
In Figure 6.7 it is also possible to see that labor productivity went through four different stages. The first one, which goes from 1984 to 1988 and corresponds to the end of the 1982 economic crisis, is characterized by a sharp fall in labor productivity. In the second period, spanning from the first quarter of 1988 to the end of 1992, labor productivity stagnated. In 1992 an upward trend in productivity began, which continued until 1997, representing an important improvement in labor productivity indicators, and taking the index back to 1984 level. The improvement in the index coincided with the structural reforms of 1990 and 1991, which reached areas such as trade, financial, capital and labor markets. Finally, a steady decline in labor productivity partially triggered by the severe economic crisis that took place in the late 1990s can be observed starting in 1998. This last period brought back productivity to its 1988 level and is particularly worrying for its magnitude and persistence.

The evolution of labor productivity by sector did not mirror the trends observed at the aggregate level. In fact, trends were quite heterogeneous among sectors. Construction and commerce, two sectors that are labor intensive, exhibit very similar patterns, and represent an important portion of the total GDP, experienced an important decline in labor productivity during the 1980s and 1990s. Indeed, by the third quarter of 2003, labor productivity for construction and commerce was approximately 70% of the level observed in 1984. The decline, which is higher than that observed at the aggregate level, is very likely related to the fact that construction and commerce were badly hit by the 1999's crisis. In contrast, manufacturing, public utilities and services (health, education, recreation, and government services) displayed an increasing trend and productivity levels higher than the average sector during the 1990s⁴¹. In fact, the services sector showed productivity growth rates higher than any other sector since 1992. During the recession falls in productivity affected sectors across the board, though those just mentioned suffered a smaller decline than the average, with manufacturing displaying the smallest fall of all.

41 Within the manufacturing sector, significant heterogeneity can be observed, with activities such as apparel, chemicals, plastic, pottery, iron, non-ferrous, leather, registering labor productivity increases, and others, including footwear, wood, other chemicals, petroleum, rubber, and non-metallic, with stagnant or falling labor productivity (see Appendix 4 in Gracia and Santamaría). These differences among sectors' performance warrant further analysis.

In Figure 6.8, where the evolution of the capital-labor ratio is depicted, two relevant facts stand out. On the one hand, it can be observed that increasing manufacturing labor productivity was driven by factor substitution. On the other hand, less productive workers seem to have been absorbed by activities with a bigger share of informal activities, which is evidenced by the fact that the capital labor rate grew in low-skilled labor sectors more than in any other type of sectors until 1993.

Figure 6.8: Capital-Labor Ratio in Manufacturing by Factor Intensity



Source: Gracia and Santamaría (2004)

Despite the fact that results at the aggregate level show a sharp decrease in labor productivity, they hide considerable heterogeneity, with some sectors performing much better than aggregate results indicate. As mentioned above, it is very likely that poor labor productivity performance has contributed to the disappointing evolution of Colombia's TFP growth. Gracia and Santamaría argue that the observed poor productivity trends are a source of concern for a number of reasons, including: (i) it encourages informality to the extent that it makes the opportunity cost of being formal too low; (ii) it negatively impacts earnings growth; (iii) it slows down economic growth and (iv) it hampers competitiveness, therefore jeopardizing the ability of the country to take advantage of the globalization process. Indeed, regression analyses carried out for the manufacturing sector (panel data using the same methodologies mentioned above) show that TFP is positively related to employment and wages, reason for which the poor performance in terms of salaried employment generation, unemployment and wages highlighted in the previous chapters is, to a large extent, determined by the recent behavior of productivity growth.

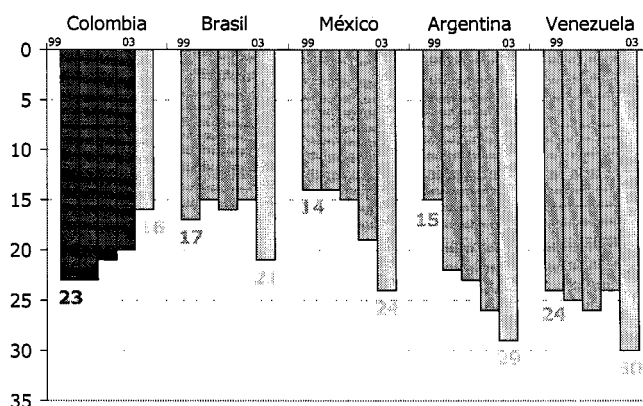
- Competitiveness

The outcomes of a number of indices evaluating competitiveness surveyed by Echeverry and Hernández (2005) show that Colombia has clearly improved its competitive position in the international context between the late 1990s and 2003. The Institute for

Management Development (IMD)⁴² analyzes several countries' competitiveness levels following Garelli's (2001) conceptual approach, which examines the impact of a country's tradition, history, cultural and ethical conventions on its economic performance and infrastructure, as well as the level of efficiency of its government and business community. Granting equal weight to these factors, the IMD assembled an index of competitiveness in which countries are sorted by their populations' size.

Colombia's performance was compared to that of other countries with at least 20 million people. In order to measure the variables, statistical indicators from national and international organizations, as well as data from *The World Economic Forum* Opinion Executive Survey, were used. Figure 6.9, which depicts the evolution of selected Latin American countries between 1999 and 2003 (from a total of 30 countries in the group being compared), shows the favorable evolution that Colombia underwent during the period, going from a ranking of 23rd to 16th out of 30 countries, which is still a not very satisfactory standing. Of the factors mentioned above, in 2003 Colombia's level of government efficiency and the state of its infrastructure both contributed positively to the improvement of its competitiveness. On the other hand, economic performance and the level of the business community's efficiency, both of which present signs of deterioration in 2003, negatively influenced its place in the rankings.

Figure 6.9: Index of Total Competitiveness 1999-2003



Source: The World Competitiveness Yearbook 2003

The *World Economic Forum's* (WEF) Competitiveness for Growth index evaluates the potential of economies to reach strong economic growth in the medium and long term⁴³. The WEF also constructs the Business Competitiveness Index, which evaluates the microeconomic environment in which firms operate to establish whether it is conducive to producing high value added goods and services efficiently⁴⁴. Both indices are constructed with macro and microeconomic information from the WEF's Executive

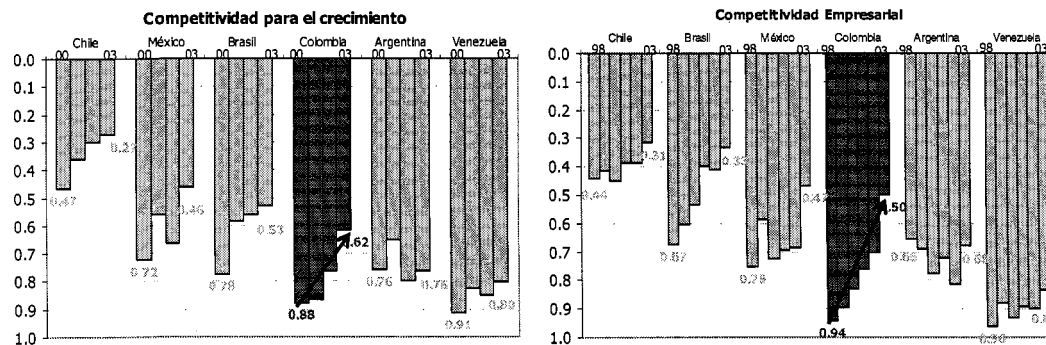
⁴² The IMD is part of the University of Economy and Administration of the University of Applied Sciences of Basel, Switzerland, http://dwi.fhbb.ch/wiba/wiba.nsf/pages_e/homepage.

⁴³ The World Economic Forum is an international non-governmental and independent organization, whose function is to provide detailed information about world-wide economic conditions, with the purpose of facilitating the transition towards the globalization (www.weforum.org).

⁴⁴ Some of the optimal characteristics of a competitive businesses atmosphere include limited government intervention, which stimulates investment, but also protects intellectual property rights.

Opinion Survey, conducted with the collaboration of national institutions and directed to senior executives and businessmen. Data availability limits the period of analysis for the Growth Index between 2000 and 2003. For the macroeconomic index, the period analyzed is from 1998 to 2003⁴⁵. Figure 6.10 shows the considerable progress achieved by Colombia in terms of both growth and business competitiveness between 1998 and 2003. It can also be observed in the graph, though, that the country is still ranked below the main Latin American economies.

Figure 6.10: The index of competitiveness in Colombia 1998-2003



Source: Echeverry and Hernández (2005)

Of the factors determining Colombia's position in the growth index, macroeconomic performance, public institutions, and technology show a remarkable improvement in the period studied. Surprisingly, though, it is macroeconomic performance which seems to have the most positive impact on the country's competitiveness level. In terms of factors determining the business' competitiveness, the level of companies' operational and strategic advancement, as well as the quality of the environment in which they operate, appear to be the crucial determinants. Thus, these indices in general show an improvement since about 1998, although the ranking of the country continues to be not very satisfactory. Importantly, labor market conditions and labor costs seem to be key aspects undermining competitiveness, especially within the World Bank's WBES, despite improvements brought about by the recent reforms.

Qualitative work carried out with four of the main productivity chains for this Report (see Echeverry and Hernández, 2005 for a very detailed account of this exercise) showed that an area requiring immediate attention to improve their competitiveness is the reduction of tariffs on agricultural products, particularly those on which the industrial sectors depend. Indeed, in all four chains, the link constituted by raw material is the weakest and most unproductive one, imposing serious limitations to the ability of the other links of the chain to be cost-effective and competitive. The limited productivity of raw material producers, as well as their poor quality, forces national industries to rely on imported raw material. However, since agriculture producers enjoy high levels of protection,

⁴⁵ Because the sample size increases every year, an index was constructed to control for the number of countries so that the sample can be analyzed over time. This index equals: Position of the country/Sample size. It is important to note ordering by sample size prevents to comparing the performance of Colombia with respect to countries that initially composed the index.

Colombian industries have to purchase the entirety of the national supply of agricultural product before being able to access international markets. Such high levels of commercial protection of the first link are probably motivated by the influence that this link enjoys in the legislative power. Another common problem mentioned was the bad geographic location of the plants where the final product is elaborated. All chains but Textiles are located near the end market but far from ports and main suppliers, legacy from the imports substitution model.

The position of the chains with respect to the free trade agreement (FTA) with the US very much depends on the link from which it is observed. For producers of raw materials, the FTA is clearly a threat, because it represents not only the potential loss of the commercial protection currently enjoyed, but actually increased competition with US agricultural products. For the intermediate and final links of the production chains, conversely, it represents the opportunity to access raw materials of greater quality and considerably lower cost. Finally, it is not clear the extent to which productivity chains in Colombia are indeed constituted to optimize productivity. Instead, the exercise revealed that linking different stages of the chain may be a way to make non-competitive sectors viable, in which case they can introduce internal rigidities that threaten innovation. The two labor reforms of the 1990s were viewed as positive by the firms, although they expressed that the cost reduction brought about by the 2002 reform was not particularly impressive. They mentioned, however, that the reduction of firing costs has been instrumental in enabling the industry to confront increasing competition from abroad and that the Colombian labor legislation is still out of date in terms of hiring modalities.

The analysis of productivity and competitiveness in Colombia showed how trends in the country's productivity level have affected its ability to grow. The evidence presented in the chapter indicates that TFP contribution to growth was among the highest in LAC during the 1960s-1980s. In the context of the region's poor performance of the 1980s, Colombian productivity was among the most solid. However, during the last decade analyzed, and in the midst of regional recovery, the country was one of the few LAC countries to register productivity contractions, only outperforming Paraguay. The evolution of TFP growth seems to be the key element behind the fact that the country's growth trends during the 1980s and 1990s were so different from those observed in the rest of the region. TFP for the manufacturing sector also presented important fluctuations, but did not necessarily mirror the evolution of TFP at the aggregate level. In contrast with results at the aggregate level, some sectors presented positive growth during the 1990s, though an abrupt reversal took place towards the end of the decade, most likely triggered by the recession, combined with the increased severity of the armed conflict and the heavy burden posed by an unsustainable fiscal deficit.

Intensifying levels of violence, along with the increasing weight of the government burden seem to have been among the main factors behind the disappointing performance of the 1990s, which offset the positive effects brought along by improvements in trade openness and education attainment, as well as the reduction of firing costs. However, evidence indicates that cyclical factors were also responsible for the variation in TFP. Results for the manufacturing sector suggest that the business cycle also affects TFP growth at the sectoral level. In addition, when controlling for education, exports

orientation and industrial concentration, it was found that technology adoption has a positive impact on TFP growth. However, wage benefits, measured as the ratio of non-wage cost to total remuneration, have a negative effect on TFP growth as they appear to weaken incentives to innovate.

Trends in labor productivity during the period were worse than those observed for total factor productivity. In fact, the disappointing evolution of TFP in Colombia was likely related to poor labor productivity growth. Though labor productivity improved during the early- to mid-1990s, coinciding with a round of structural reforms that affected trade, the financial sector, and capital and labor markets, by 2003 it had fallen below the level observed in the early 1980s due to a steady decline during the late 1990s. In fact, when the average level for the whole decade of the 1990s is considered, Colombia was the only country in the region to actually register a contraction in labor productivity. At the sectoral level, labor productivity trends during the 1990s were considerably more heterogeneous, with sectors like construction and commerce presenting sharp declines in labor productivity levels, while manufacturing, public utilities and services experienced increases above average. Overall, the severe economic crisis of the late 1990s affected sectors across the board, with most showing declines in labor productivity towards the end of the decade.

Despite the poor progress observed in productivity levels during the 1990s, indexes measuring competitiveness levels across countries, such as the IMD' Index of Total Competitiveness and the WEF's Competitiveness for Growth index, show considerable improvements in Colombia's ranking with respect to comparable countries.

7. FINAL COMMENTS AND KEY POLICY ALTERNATIVES

This concluding chapter summarizes the choice of approach, highlights the innovative features of the report, recapitulates the main findings, and discusses the main policy alternatives available to the government in the context of the key findings.

This report adds a series of novel features (and methodologies) to the existing understanding of labor markets in Colombia, and is produced at an opportune moment in light of the intense debate taking place in the country with regards to the labor reform of 2002, presently under heavy scrutiny. The main innovations of the report are:

- **It is the result of a truly collaborative effort between the Bank and the Government.** The key objectives from the Government side are to evaluate the labor reform of 2002, to understand the reasons for chronic high unemployment, and to look at issues of competitiveness in view of the free trade negotiations with the US. Thus, the subjects included were discussed extensively with the government (and Congress and Academics) from the very beginning and constant interaction has been the norm all along the implementation of the Project. In this context, for example, workshops were held in Bogotá in 2004 to discuss the main findings and to sharpen the messages. Additionally, some of the analyses were carried out directly by the government using their own resources. Finally, intense interaction existed also with some members of Congress and with other Bank teams working in Colombia to ensure consistency in the messages and feasibility of the proposals.
- **Characterizes the Colombian labor market, and describes its evolution in the last decades.** It addresses the most relevant aspects of the public debate in Colombia today. Within this general context, it traces in a detailed way the links between outcomes (employment, wages, informality and productivity) to the factors that affect them and that are generally perceived as being key (non-wage costs, minimum wages, participation, public sector issues -analyzed in a rigorous way for the first time here- and public interventions). The goal is to arrive at policy options to improve outcomes.
- **Identifies the links and the channels through which “exogenous” factors affect outcomes.** We use rigorous methodologies that allow confidence in the results. Also, and importantly, to identify the links, determinants are analyzed in a compact framework, which controls for the seemingly greater difficulty of the urban labor market to adjust to shocks, generating a higher level of unemployment recently.
- **Analyzes self-employment and informality in detail, vis-à-vis salaried employment.** This analysis is novel in the country and proved very useful in understanding key characteristics of the labor market, especially on issues related to segmentation and previously unidentified channels through which determinants affect outcomes. This is complemented with a thorough study of how employment behaves along the business cycle for different sub-groups of the population.
- **Provides the first clues of the impact of the 2002 labor reform on labor market outcomes.** This is one of the main innovations introduced by the report since it is bound to importantly influence the debate in the country. These analyses were carried out in the most rigorous way possible and using many alternative sources of information. Furthermore, the different analyses supported by this task have already

had a profound impact on the debate within the country and have created sound discussion among many actors, including government, academics, congress and unions.

- **Incorporates productivity into the labor market analysis.** This is both to understand the role it has played in the recent evolution of the labor market and investigate the link between productivity related outcomes and labor market regulations.
- **Examines the implications of labor market functioning for the most vulnerable.** The report explicitly addresses this issue, approximating the most vulnerable population by the least skilled in terms of education and age. In particular, it examines how, in most of the cases, Colombia's poor are the most disadvantaged by labor regulations, supposedly designed to help them, resulting in their (partial) exclusion from the labor market in terms of employment, formality and wages.

In terms of the main findings of the report, the summary starts with those related to the most important outcomes.

- **The Colombian urban labor market seems to have “stabilized” at a higher level of unemployment and labor participation has increased markedly.** Hours worked declined in the last ten years.
- **The labor market is increasingly female and commerce and service oriented.** Indeed, the composition of employment changed radically. While in 1980 four out of ten women were in the labor force, today this figure is six. The share of the services and commerce sectors grew by more than 13 and 30%, respectively over the period.
- **In terms of occupations, the composition of the urban labor market became more self-employed oriented.** The important things about this move are that these new self-employment jobs appear to be of low quality; and that the labor market shifted toward a higher level of segmentation in the period 1995-2002. That is, self-employment now seems to be increasingly populated by individuals that would prefer to be in a salaried job but cannot find one.
- **The labor market has a stable share of informal salaried employment,** despite an important increase during the 1990s. Indeed, the share of informal salaried workers remained stable at around 35%, after reaching a peak of 40% in 1998.
- **Wages, which are related to productivity, show sluggish growth if the entire period is analyzed.** Indeed, they increased by some 9% between 1984 and 2004 (i.e. less than 0.5% per year). However, wage growth was impressive during the expansive period 1991-98, which also coincided with a period of high productivity growth.
- **The labor market has become less flexible to adjust to macroeconomic fluctuations in recent years.** That is, when economic growth declines an increasing part of the adjustment is made through quantities (i.e. increasing unemployment).
- **Women of all ages (but especially the young), teenagers and the unskilled are the groups of the population that suffer the most during contractions of aggregate economic activity** and, despite their lower share of the population compared to other groups (except women), are the groups that cause the larger movements of the overall unemployment rate.

- **All outcomes tend to be worse for the least and intermediate skilled, especially the latter**, when compared to the rest of workers.

Now, in terms of the factors that affect those outcomes, the key findings may be summarized as follows:

- **Increasing participation rates, especially female and young, have had an important impact on unemployment, particularly during the recession.** Participation, in turn, has been driven mainly by cultural changes in the Colombian society and by fluctuations of GDP. Thus, during the recession participation of women and young workers increased substantially.
- **Minimum wages and non wage costs appeared as key determinants, not only of employment and unemployment, but of self-employment and informality.** Their effect became particularly pervasive starting in 1998/9 for minimum wages and 1995/6 for non-wage costs. Minimum wages seem to be particularly relevant for the determination of employment levels, while non-wage costs appear to affect especially the split between occupations.
- **Overall wages seem to have become less sensitive to the cycle, a fact that is also partially explained by the behavior of minimum wages and non-wage costs in the last ten years.** However, public wages, which may be acting as a “lighthouse” at least for workers with intermediate or low education, are also affecting overall wages and, through this channel, unemployment.
- **Economic growth, or the cycle, seems to be a more important now to unemployment levels than it was ever before.** Therefore, the importance of maintaining macroeconomic stability cannot be sufficiently stressed. Also, an important finding is that the effect of the cycle on unemployment has two main channels: through a decline in employment generation and also through an increase in participation (among women and the young), which are highly sensitive to the cycle.
- **Poor performance of productivity growth**, at the aggregate level (for the entire economy), seems to be related to high and binding firing costs, increasing participation of the state in the economy (proxied by the level of public spending) and by the intensification of the armed conflict. Also, it was found that a higher level of exposure to international markets has impacted productivity growth positively. At the sectoral level (within manufacturing), the analyses showed that the most important determinants are related to the level and evolution of non-wage costs (negative) and to the degree of technological adoption (positive). Surprisingly, external trade related variables turned out to be not particularly important at the sectoral level. Importantly, **Poor performance of productivity growth** seems, in turn, to be a major determinant of sluggish growth of salaried employment and wages.

Key findings of the Report regarding the impact of the reform include:

- the reform substantially increased the employment of young workers;
- reduced the level of informality, especially among the least skilled;
- had a positive and substantial effect on wages, also more marked among the least skilled;

- seem to have increased overall employment, although moderately, suggested by the low positive response of employers to the question of whether the reform has been a major factor for increasing employment;
- reduced underemployment for insufficient hours;
- however, there was no evidence of a positive impact on actual hours worked; and
- the provisions that waive payroll taxes seem to have had little or no impact.

The creation of the system of unemployment assistance was a major innovation of the reform. However, most of the beneficiaries are unemployed who come from the formal sector, that is, the least vulnerable. Yet, most of the unemployment comes from the informal sector. While some benefits are targeted to them, they are only a small portion of the total.

Thus, this review illustrated key problems faced by Colombia: slow growth reflecting poor TFP performance, high and persistent unemployment, and labor market rigidities that help keep unemployment high. Binding minimum wages, high non-wage costs, and rigid wages prevent a swift return to low unemployment. Additionally, increased participation of women and other groups in the labor market will add to the pressure on employment. Past reforms have had a mixed impact, in some cases encouraging a move to the informal sector and unemployment (Ley 100), and in other cases lowering non-wage costs and easing hiring and firing (labor reforms of 1990 and 2002). Thus, Colombia today is faced with three broad objectives: first, making the labor market as efficient as possible, favoring formal employment and wage growth; second, increasing TFP and labor productivity growth as a precondition for stronger economic performance and employment and wage growth; and third, providing an effective and more inclusive system of social protection. This last assertion is based on the observation that unemployment increased substantially and that it is highly unlikely that it will decline to levels below 10% soon. In effect, it seems that Colombia, as a society, has chosen a path in which binding minimum wages, high non-wage costs and rigid wages are preferred to low unemployment, which is a choice in sharp contrast with that made by other countries, for example, Mexico. Thus, the following are the five key areas proposed for policy attention.

The current debate about the Labor Reform should focus on the necessary improvements and not in the convenience or inconvenience of the reform as a whole. The 2002 labor reform showed positive results in important areas and, thus, the debate should focus on ways to improve those aspects that can be improved, rather than on the convenience or not of the reform as a whole. Even thinking of reversing the reform, and thus sending the signal to the market, would have negative consequences for the investment climate and, more importantly, could generate reactions on the part of employers that would ultimately hurt workers. For example, employers may fire workers with more than ten years of tenure because they know that, with the reversal, an increase of firing costs for these workers would ensue. Additionally, this debate should be more inclusive, bringing in, for example, the unemployed, the self-employed and those not belonging to organized groups. Indeed, those that do belong to such groups have usually had excessive influence on the design of this type of intervention. Given the facts

expounded above relating to minimum wages, non-wage costs and other wage rigidities, measures of flexibilization, such as the ones introduced by the reform are good alternatives to generate more employment opportunities for the most vulnerable (for whom these rigidities tend to be more binding).

Minimum wage growth needs to be constrained. This report and other studies provide evidence that the current pace of minimum wage growth cannot be maintained without productivity expansion that makes it sustainable in the long run. The objective of providing a minimum standard of living should be viewed in a broader fashion, by realizing that excessive increases of the minimum wage jeopardize directly the standard of living of those who become unemployed or informal, who, according to the findings of the Report, are concentrated on the least and intermediately skilled and the young (the most vulnerable). Therefore, the minimum wage must be set at a level that balances income goals with the market responses to the instrument, which is clearly not the case right now in Colombia. It suffices to note that the country has the second highest minimum to average wage ratio in the LAC region. A minimum wage that is set this high actually *increases* poverty and income inequality, so social justice guidelines should be implemented in a way that the different effects of the instrument are taken into account. Until now, these guidelines have been interpreted only considering the supposed increase of labor incomes for low earning workers brought about by generous adjustments of the minimum wage. However, the other half of the story has been missing: those workers are precisely the ones who become unemployed or informal because of the unsustainable growth of minimum wages.

Therefore, and taking into account that in 1998 a substantial “overshoot” took place (the minimum wage grew by more than 8 percentage points in real terms), from now on minimum wage setting should be based on productivity increases and conservative estimates of future inflation, recognizing explicitly the costs in terms of unemployment and informality. That is, the final goal should be to bring back the real minimum wage to pre-crisis levels in the near future, ensuring that it maintains a close link with the evolution of productivity. While recognizing that this is a very sensitive issue, some actions may be taken in the short run to confront it, starting with wide dissemination efforts of the negative impacts of unwarranted increases of the minimum wage on the employment opportunities of the most vulnerable and, therefore, on the welfare of those workers and their families. Dissemination efforts to make the public (especially the unemployed) aware of the negative effects of “unwarranted” increases of the minimum wage have never been undertaken, and could be an effective instrument to gain support for reforms to the minimum wage setting mechanism, which very well could start with a policy CONPES document that lays out the main findings of the literature and sets the base for reform.

This last point is crucial. Until now, but particularly in the last six years, minimum wage setting in Colombia has favored the interests of only a portion of the labor force that is very well represented by the unions and exerts substantial influence on the decisions related to the minimum wage. Unemployed and informal workers, on the other hand and despite being the most affected, have had little or no voice in these decisions, partly

because they do not have objective evidence on the impact of the minimum wage on their welfare, and partly because they lack organization to be able to effectively participate in the decision instances or voice their concerns to the relevant authorities (e.g. constitutional court).

Finally, since the pressure from increased female and teenage participation on the labor market is likely to continue, especially in future downturns of the cycle, a particularly efficient policy would be to establish lower minimum wages for the young. This would help in overcoming the obstacles they face to access the labor market, which become more binding due to the relative higher sensitivity to participate, as a response to movements of the cycle, observed among these workers. This policy has been used in other countries and, in the case of Colombia, the effectiveness of the apprenticeship contract provides support for its adoption.

Wage taxes cannot be increased further and, in the longer run, they should be reduced. That is, the Colombian payroll is already heavily burdened with taxes. The prospects for reducing wage taxes are not bright given the current fiscal situation, and the expectation of future needs for pension financing. Therefore, two alternatives exist to deal with this predicament. First, reduce some components of non-wage benefits, such minimum legal mandates on paid vacations, parafiscales or other benefits. This could be accomplished, for example, by allowing individual negotiation of contracts and reducing the minimum legal mandates. The second alternative has to do with beginning to think about the possibility of de-linking social security and (at least in part) social protection from the labor market, which is a very current debate in most of Latin America. In any case, this will be the outcome in the future, which reinforces the importance of starting to think about the issue early. A careful look should be given to the parafiscales, which amount to almost 0.5% of GDP, to gauge if the services provided are valued by society by that much. Second, the source of this financing should be re-examined. For example, is it appropriate that employers alone pay for a wide variety of social protection needs or should the burden also be allocated also to other members of society? Also, careful evaluation of the programs financed by these taxes is badly needed to be able to make difficult decisions about their permanence. In any case, an ample debate on the convenience of the parafiscales, including the government, Congress and civil society, is long overdue. Note that, given the results of the last chapter, taking actions related to non-wage costs is also essential for the evolution of productivity growth and to foster innovation and adoption of new technologies and, thus, for the prospects of economic growth in the country.

Given these considerations, at this point it is fundamental to highlight the following: the results presented in the Report related to minimum wages and non-wage costs clearly point out the fact that the Colombian labor market moved to a more inflexible stance since 1998. This is key because it means that, increasingly, the labor market adjusts to the cycle through quantities (i.e. generating unemployment) rather than wages. In this context, urban unemployment appears to have stabilized at a higher level in the latest years, showing remarkable resilience to fall. Thus, if no actions are taken to tackle the issues of minimum wages and non-wage costs, the country will be faced, inevitably, with

costly, and possibly inefficient, alternatives to deal with this situation. One of them is, for example, the introduction of a more inclusive system of unemployment protection system, revamped to extend coverage to the informal sector. This, however, will be complex given the present tight fiscal situation and the institutional difficulty of designing and administering such a system.

As always, the macroeconomic environment is extremely important, but not only in terms of growth and employment creation. Public spending and the volatility of the exchange rate were shown to importantly influence the evolution of employment, segmentation and productivity. Thus, the importance of strengthening macroeconomic stability and containing public spending becomes even more essential. In this respect, the CEM produced by the Bank highlights the importance of acting on items such as transfers to sub-national governments, pensions and the many inefficiencies of the tax system. More broadly, the goal is not only to maintain a stable macro environment, but also to reduce the government burden on the development of the private sector (including taxes and regulations), which has become a constraint for higher productivity growth. In this context, issues of regulation, financial sector development and the quality and efficiency of the judiciary, also analyzed in detail in the CEM, should be confronted as soon as possible.

Developing a more effective, coordinated and inclusive system of social protection, which provides protection to the self-employed and informal workers, who in the current system are almost completely unprotected. Including them, however, is not an easy task, given the already high burden of non wage costs. Also, providing social protection to self-employed and informal workers constitutes a challenge from the fiscal point of view because, in the end, somebody pays for the services they have access to, even if they are of low quality. Key policy questions, which call for difficult trade-offs, are:

- how to reshuffle spending among the wide variety and dispersion of programs existing today, action which calls for a clear identification of priorities and bottlenecks. It would also entail a redirection and reshuffling of resources among the current programs;
- should some sort of assistance to the unemployed who come from the informal sector (at least the poorest) be provided? This group, besides including the majority of the unemployed, comprises the most vulnerable workers. However, a more even distribution of the funding destined now to the unemployment protection system created by the labor reform, plus a redirection of resources used in other programs (e.g. SENA and CCFs) will be required to do this. It may be also necessary to differentiate unemployment insurance from unemployment assistance. Insurance, by definition, is a system where people pay in, pool risk, and withdraw if they are negatively affected by the shock. The distinction is important because benefits to workers who have not contributed may be lower than those obtained by workers that contributed, allowing higher coverage among informal workers.
- how to de-link social protection and insurance from the labor market. This would serve two purposes: removing from the labor market one of the major constraints for formal employment creation, and helping in the simplification of the tax system.

Without doubt, this is an issue that, in any event, will surface soon taking into account the fact that labor markets are not structured as they were when the social protection systems were originally conceived, meaning that the de-linking is crucial so that services can be provided to those who are not formal. This question, however, needs to address other important issues, such as the following: (i) should the de-linking only cover some services within the general umbrella of social protection? (ii) can social protection and insurance services be unbundled to favor choice by the worker according to family needs?

- given the heterogeneous nature of self-employment in Colombia, in which segmentation has risen, the design of social insurance mechanisms gains special relevance. Attempts to expand coverage of benefits to the self-employed without any cost or link to other dimensions of salaried employment may simply shift the labor market towards that occupation even more. Thus, the design of any social protection system in the future has to have a comprehensive view that takes into account the incentive effects throughout the entire labor market;
- an important component of this system would be a well-designed training program for the unemployed that takes advantage of the existing network of training institutions, and uses flexible arrangements that favor choice. Thus, the reform of SENA, currently underway, should be given priority within the government.
- what to do with the program “Familias en Acción” in the near future, in terms of long term financing and administrative placement.

Additional policy options include:

Designing more specific interventions to facilitate access to the labor market by women and the young. Given the findings of their difficult access to the labor market and their sensitivity to the cycle, this action would ensure an efficient use of the resources and a greater impact on outcomes. These interventions can be designed both to contain participation and promote formal employment. Examples include targeted active labor market policies to facilitate the flow of information, for which the Mexican experience can be valuable; training programs for the young within a more decentralized and competitive system in which the supply of programs matches market needs more closely; and support for job search, also targeted. Note, though, that the best way to enhance the possibilities of these groups (especially the young) of finding good quality jobs would be to align the minimum wage to market realities.

The program that fosters access to undergraduate studies to poor and middle income students, currently underway, is an important component of this strategy (both on the participation and employment sides), which also will have longer term effects, both on employment and productivity. This program should be given continued support. This is especially important when thinking that most of the labor market outcomes (employment and wages) have deteriorated the most for high school graduates.

More thought and analysis should be given to the apprenticeship contract in order to slightly adjust the instrument. Given the evidence, it would seem that the benefits arising from this instrument are higher than the costs. Thus, it may be useful to analyze

the issue of the compulsory quota of apprentices more thoroughly to answer some questions, such as the following: do firms get additional information about potential workers and thus decrease the expected cost of hiring new workers? Do the apprentices have a higher likelihood of getting a job, and thus this is a kind of job-training, which should be subsidized by SENA? Could the cost of "buying-out" of the apprenticeships be adjusted? Are firms taking advantage of other cost-saving regulations which could lower their overall tax bill? A review of these issues could better help the Government determine how and to what extent to revise the apprenticeship quotas.

Regarding the 2002 labor reform and related to the first recommendation, things that could be subject to some refinement include the following (besides the UI, the parafiscales exemption and the AC, already analyzed):

- an area in which there is still room to act and the payoff in terms of formalization could be sizeable, but the political space at this point is very limited, is hiring regulations. None of the labor reforms of the last few years really addressed this issue (the "salario integral" was an important step but its threshold is so high that it is mostly non-operational and only favors high earners). Schemes like the contract by the hour, the reduction of the threshold to apply the salario integral, or an extension and flexibilization of the "período de prueba" (probation period) constitute sound alternatives;
- extra costs related to work on Sundays or holidays are still very high (the highest in the LAC region) and, therefore, there is still room to act on those;
- the "regular shift" in commerce and services should be fostered more forcefully;
- the dissemination efforts of the main provisions of the law need to go further and utilize all available means to reach their targets; and
- given the poor results obtained with the exemption of Parafiscales and the slow start of the PADE program, it is recommended that the government carries out a rigorous analysis of why the entrepreneurs are not using these subsidies. Is it a problem of information or rather that the amount of the subsidy is still too low? May there be other problems?

Completely revising public labor market regulations, especially those related to remunerations and hiring and firing clauses. The impact of the public-private wage premium appears detrimental for the poorer segments of the population due to the rigidity that is transmitted to the overall wage structure. The wage structure of public employees should be more closely linked to the market wages and employee performance, more so when taking into account the significant discrepancies found within the public sector (executive vs. legislative and judiciary). This, however, needs to be part of a broader civil service reform initiative oriented at offering clearer incentives to public employees, on which the government is already working.

The issue of protection to the agricultural sector, which is discussed in the country, again surfaced in this report. It seems to be time for seriously addressing it, beyond political considerations, and weighing its benefits and costs, especially related to

productivity growth and competitiveness. Also, it is not clear what are the welfare benefits arising from this protection.

The collection of information to evaluate and carry out cost benefit analysis of many labor market interventions, including the labor reform, now seems key, especially taking into account the important decisions that are approaching.

Finally, some philosophical considerations that link many of the most important findings of the report. The analyses carried out suggest an important agenda for labor reform beyond the usual focus on wage rigidities driving segmentation and unemployment: eliminating the inefficiencies in the provision of medical benefits or pensions or biases in promotion systems not based on merit will reduce the incentive to informality and increase the supply of labor to the formal sector. More fundamentally, informal employment in firms of relatively low technology and capital intensity (usually small firms in the SE sector) can only be attractive if the overall level of labor productivity in the formal sector is low, as seems to be the case in Colombia. To the extent that regulations hinder investment in physical or human capital, or prevent the efficient organization and operation of firms, it perpetuates the low levels of productivity throughout the formal economy and, thus, the levels of segmentation, low wages and informality. Thus, increasing the size and productivity of the formal sector probably offers the largest hope for raising the standard of living of workers throughout the economy over the longer term. While it is true that micro-firms that participate in business associations, credit institutions, and training institutions are more prosperous, the evidence suggests that the differences are not dramatic. This means that, among other things, programs such as credit targeted to small firms and promotion to participation in formal institutions, while useful to marginally raise productivity and labor incomes, should be viewed as transitional instruments.

BIBLIOGRAPHY

BACKGROUND PAPERS

- Amarante, V. and R. Arim. 2005a. "Los Efectos de la Reforma Laboral de 2002 en el Mercado Laboral Colombiano." Mimeo. Montevideo, Uruguay.
- _____. 2005. "Public-Private Wage Differential in Colombia 1991-2003." Mimeo. Montevideo, Uruguay.
- Díaz, A. M. and M. Santamaría. 2005. "What Matters for Labor Market Outcomes in Urban Colombia?" Forthcoming. The World Bank.
- Echeverry, J.C. and M. Hernández. 2005. "Posibilidades y Limitantes de un Cambio en la Productividad de los Sectores Colombianos." Mimeo. Bogotá, Colombia.
- Gaviria, A. 2005. "La Reforma Laboral de 2002: ¿Funcionó o no?" Mimeo. Bogotá, Colombia.
- Gracia, O. and M. Santamaría. 2005. "Colombian Productivity: Looking at the Main Stylized Facts and New Hypotheses." Mimeo. The World Bank.
- Núñez, J. 2005. "Éxitos y Fracasos de la Reforma Laboral." Mimeo. Facultad de Economía, Universidad de los Andes. Bogotá, Colombia.
- Sánchez, F. et. Al. 2004. "Caracterización del Mercado Laboral en Colombia." Mimeo. Facultad de Economía, Universidad de los Andes. Bogotá, Colombia.

BACKGROUND NOTES

- Díaz, A. M. 2004. "Participación Laboral y Desempleo en Colombia." Mimeo. Facultad de Economía, Universidad de los Andes. Bogotá, Colombia.
- Prada, M. F. 2004. "Efectos sobre el Mercado Laboral de la Reforma a la Seguridad Social en Colombia." Mimeo. Facultad de Economía, Universidad de los Andes. Bogotá, Colombia.
- Salas, L. M. 2004. "Análisis de Salario Mínimo: Efecto en el Empleo." Mimeo. Facultad de Economía, Universidad de los Andes. Bogotá, Colombia.

OTHER REFERENCES

- Abraham K. and J. Haltiwanger. 1995. "Real Wages and the Business Cycle." *Journal of Economic Literature, American Economic Association*, vol. 33(3), pages 1215-1264.
- Angrist, J. and A. Krueger. 1999. "Empirical Strategies in Labor Economics." *In Handbook of Labor Economics*, Volume 3A, North Holland, Chapter 23.
- Arango, C. A. 2003. "Minimum Wages in Colombia: Holding the Middle with a Bite on the Poor." Mimeo. Bogotá, Colombia.
- Bendini, M, O. Gracia and M. Santamaría. (2004). Short Run Output Shocks and Labor Market Performance: the Case of Mexico." Mimeo. The World Bank, Washington, DC.
- Bentolila, S., and G. Bertola, 1990, "Firing costs and labor demand: How bad is eurosclerosis?," *Review of Economic Studies*, Vol. 57, No. 3, pp. 381-402.

- Bernard, A. and C. Jones, 1995. "Productivity and Convergence across U.S. Industries," Working papers 95-4, Department of Economics. MIT. Cambridge, Massachusetts.
- Bils, M. 1985. "Real wages over the business cycles: evidence from panel data." *Journal of Political Economy* 93, 666-89.
- Capelli, P. 2000. "Examining the Incidence of Downsizing and Its Effects on Establishment Performance." In D. Neumark, ed., *On the Job*. Russell Sage Foundation. New York.
- Cárdenas M. 2002. "Economic Growth in Colombia: A Reversal of 'Fortune'." Archivos de Economía No. 179, Departamento Nacional de Planeación. Bogotá, Colombia.
- Chica R. 1996. "El crecimiento de la productividad en Colombia", Departamento Nacional de Planeación-Colciencias. Bogotá, Colombia.
- Clark, K. and L. Summers. 1981. "Demographic Differences in Cyclical Employment Variation" *The Journal of Human Resources*, Vol. XVI, (winter) pp. 61-79.
- Clavijo S. 2003. Crecimiento, Productividad y la 'Nueva Economía': Implicaciones para Colombia. Mimeo. Bogotá, Colombia.
- PAGE 68 & 91 - Comisión de Seguimiento a las Políticas de Generación de Empleo. 2005. "Evaluación Integral de la Política General de Empleo y los Principales Componentes de la Reforma Laboral: Período 2003-2004." Bogotá, Colombia.
- De Ferranti, D., G. Perry, I. Gill, and L. Servén. 2000. "Securing Our Future in a Global Economy." Latin American and Caribbean Studies Series. World Bank, Washington, D.C.
- Echeverry, J. C., A. Escobar and M. Santamaría. 2002. "Tendencia, ciclos y distribución del ingreso en Colombia: una crítica al concepto de modelo de desarrollo." In *Modelos de Desarrollo Económico en Colombia 1960-2002*. Editorial Oveja Negra. Bogotá, Colombia.
- Feiss, N., M. Fugazza and W. Maloney. 2000. "Informality, Real Exchange Rates, and Labor Market Segmentation" Mimeo. The World Bank. Washington, DC.
- Garelli. 2001. "Competitiveness of Nations: The Fundamentals." The World Competitiveness Yearbook 2001. Institute for Management Development, Switzerland.
- Gonzalez-Anaya, J. 1999. "Labor Market Flexibility in Thirteen Latin American Countries and the United States: Revisiting and Expanding Okun Coefficients". World Bank. Washington, DC.
- Gregory, R.G. and J. Borland. 1999. "Recent Developments in Public Sector Labor Markets." In O. Ashenfelter and D. Card, eds., *Handbook of Labor Economics*, Vol. 3C (North-Holland, Amsterdam) pp 3573-3630
- Heckman, J. and C. Pagés. 2004. *Law and Employment: Lessons from Latin America and the Caribbean*. University of Chicago Press. Chicago.
- Hobjin, B. and B. Jovanovic. 2001. "The Information Technology Revolution and the Stock Market: Evidence." *The American Economic Review*.
- Hopenhayn, H., and R. Rogerson, 1993, "Job turnover and policy evaluation: A general equilibrium analysis," *Journal of Political Economy*, Vol. 101, No. 5, pp. 915-938.
- Keane, M., Moffitt, R. and D. Runkle, 1988. "Real Wages over the Business Cycle: Estimating the Impact of Heterogeneity with Micro Data," *Journal of Political Economy*, University of Chicago Press, vol. 96(6), pages 1232-66.

- Kugler, A. and M. Kugler. 2003. "The Labor Market Effects of Payroll Taxes in a Middle-Income Country: Evidence from Colombia." Forthcoming. CEPR Working Paper No. 4046.
- Lindauer, D. 1991. "Government Wage and Employment Policy: A Parallel Market in Labor." In M. Roemer and C. Jones, eds., *Markets in Developing Countries*, San Francisco: ICS Press, 75-87.
- Loayza N., P. Fajnzylber and C. Calderón. 2002. "Economic Growth in Latin America and the Caribbean: Stylized Facts, Explanations and Forecasts", Mimeo. The World Bank. Washington, DC.
- López, H. 2001. "Mercado Laboral Colombiano: Funcionamiento y Barreras Institucionales." Mimeo. The World Bank. Washington, DC.
- López, H. 2004. "Evaluación de la Reforma Laboral." Mimeo. Bogotá, Colombia.
- Lucas, R.E. 1988. "On the Mechanics of Economic Development." *Journal of Monetary Economics* 22, 3-42.
- Maloney, W. and J. Núñez. 2003. "Measuring the Impact of Minimum Wages: Evidence from Latin America," NBER Working Paper 9800.
- Meléndez M., K. Seim, P. Medina. 2003. "Productivity Dynamics of the Colombian Manufacturing Sector." Documento CEDE 2003-23. Facultad de Economía, Universidad de los Andes. Bogotá, Colombia.
- Mincer, J. 1976. "Unemployment Effects of Minimum Wages." *Journal of Political Economy*. February, 84: 87-105.
- Neumark, D., W. Cunningham, and L. Siga. 2003. "The Distributional Effects of Minimum Wages in Brazil: 1996-2001." Forthcoming. *Journal of Development Economics*.
- Núñez J., J. Rodríguez and F. Sánchez 1996. "Evolución y Determinantes de la Producción en Colombia: Un análisis global y sectorial." Archivo de Macroeconomía No. 50, Unidad de Análisis Macroeconómico. Departamento Nacional de Planeación. Bogotá, Colombia.
- Oaxaca, R. 1973. "Male-Female Wage Differentials in Urban Labor Markets" *International Economic Review* 14(3): 693-706.
- Ocampo, J. A., F. Sánchez, y C.E. Tovar. 2000. Cambio estructural y deterioro laboral: Colombia en la década de los noventa. Coyuntura Económica XXX. Bogotá, Colombia.
- Panizza, Ugo. 1998. "Why Do Lazy People Make More Money?" Inter-American Development Bank (IDB). Mimeographed.
- _____. 2001. "Public Sector Wages and Bureaucratic Quality: Evidence from Latin America." *Economía* Vol. 2, no. 1
- Parente, E. and E. Prescott. 1991. "Technology adoption and growth," Staff Report 136, Federal Reserve Bank of Minneapolis.
- Parker, S. and E. Skoufias. 2004. The Added Worker Effect over the Business Cycle. *Applied Economics Letters* 11: 625-30.
- Ripani, L., M. Santamaría, and E. Skoufias. 2005. "Cyclical variations in Employment and Unemployment in four Latin-American countries." Mimeo. Washington, DC.
- Rojas, N. and M. Santamaría. 2001. "La participación laboral, ¿Qué ha pasado y qué podemos esperar?" Archivo de Macroeconomía No. 154, Unidad de Análisis Macroeconómico. Departamento Nacional de Planeación. Bogotá, Colombia.

- Sánchez, F. and L. M. Salas. 2004. "Histéresis en el Desempleo Colombiano." Mimeo. Universidad de los Andes. Bogotá, Colombia.
- Santamaría, M. 2004. "Income inequality, skills and trade: evidence from Colombia during the 1980s and 1990s." Documento CEDE 2004-02. Facultad de Economía, Universidad de los Andes. Bogotá, Colombia.
- Scarpetta, S. and Tressel. 2004. "Boosting Productivity via Innovation and Adoption of New Technologies: Any Role for Labor Market Institutions?" World Bank Policy Research Working Paper 3273. Washington, DC.
- IMF. 2005. "Labor Market in Colombia." Mimeo. International Monetary Fund. Washington, DC.
- The Institute for Management Development. 2003. *The World Competitiveness Yearbook 2003*. Institute for Management Development, Switzerland.
- World Bank. 2001. "Breadwinner or Caregiver? How Household Role Affects Labor Choices in Mexico." World Bank Policy Research Working Paper No. 2743. Washington, DC.
- _____. 2002. *Colombia Poverty Report*. Report No. 24524-CO. The World Bank. Washington DC.
- _____. 2003. *Argentina Crisis and Poverty 2003: A Poverty Assessment*. Report No. 26127-AR. The World Bank. Washington DC.
- _____. 2004. *Colombia - Technical Assistance Loan to Support the Second Programmatic Labor Reform and Social Structural Adjustment Loan Project*. Report No. 29332-CO. The World Bank. Washington DC.
- _____. 2005. *Minimum Wages in Latin America and the Caribbean: the Impact on Unemployment on Inequality and Poverty*. Preliminary draft.
- World Economic Forum. 2003. *The Global Competitiveness Report 2002–2003*. New York and Oxford: Oxford University Press.