
STUDY

Translated by Timothy Ennis

AN EXAMINATION OF WAGE INEQUALITIES IN CHILE

**Harald Beyer
and Carmen Le Foulon**

Chile has one of the highest levels of wage inequality in the world, and has had for decades. Nonetheless, this paper argues that if the wage distribution is examined in its entirety, instead of concentrating on specific indicators such as the Gini coefficient or the coefficient of variation of wages, significant changes in wage inequality can be seen over the years. In particular, all the action on inequality is occurring in the *upper part* of the wage distribution.

The authors show that wage inequality grew significantly during the 1960s, reflecting increases in the variance of wages both between and within different skill groups. The fact that this occurred more forcefully in the public sector, leads one to speculate about the possible role played by labor unions in this phenomenon.

The two ensuing decades saw significant falls in real wages for all wage earners, reflecting the high inflation rates of the 1970s and the effects of the recessions of 1975 and 1982-83 on the real wages of Chilean white-collar and manual workers. These falls were much

HARALD BEYER. Investigador y Coordinador Académico del Centro de Estudios Públicos. Ingeniero Comercial, Universidad de Chile. Candidato a Doctor en Economía de la Universidad de California, Los Ángeles.

CARMEN LE FOULON. Ingeniera Comercial, Pontificia Universidad Católica de Chile. Magister en Economía Aplicada mención Políticas Públicas, PUC. Investigadora del Centro de Estudios Públicos.

steeper among groups in the middle of the wage distribution. The least affected groups were the top wage earners. This helps to explain an increase in wage dispersion between skill groups which is compensated by a reduction in the intra-group wage dispersion. As a result, during these two decades, the more permanent levels of wage dispersion are not very different from those seen back in 1970. Finally, wage dispersion narrowed slightly in the 1990s, but not enough to compensate for the increases in inequality that occurred during the 1960s.

In their analysis, the authors highlight what has been happening with wage-earners who are high-school graduates. These have seen a drastic fall in their wages relative to those with only primary schooling. Whereas in the 1960s high-school graduates earned more than twice the wages of someone with primary education, the difference today is no more than 35%. On the other hand, the returns to higher education have grown significantly during the same period, and the educational differences between high and middle wage groups have widened. All of this goes a long way to explaining why wage inequalities have not decreased over the last four decades, despite the population's average level of schooling rising from seven years in the early 1960s to 11 in the late 1990s.

1. Introduction

There are a variety of indicators that show Latin America to be the most unequal region of the world, even more so than Africa. Some of the differences can be explained by differences in regional development levels or by methodological considerations in collecting the basic information on which the indicators are constructed. However, once such differences are controlled for, we find that Latin America has a Gini coefficient (a traditional indicator of inequality that takes values between zero and 1, zero indicating absolute equality) which is, on average, 10 points higher than would be the case if our countries were located in another region of the world. Moreover, Chile is in the more unequal half of the Latin American region, which suggests that the issue of inequality will not easily disappear from our country's political agenda nor from that of the region as a whole. Underlying this concern about inequality there is a clear desire to overcome poverty as quickly as possible. If Chile had its current per-capita income but the same level of inequality as the Republic of Korea, its poverty level would be no higher than 16%; in other words there would be nearly one million fewer poor people in our country.

Making our country more equal is an objective that cannot be abandoned. But to achieve it, we need to correctly understand the origins of our inequality. The distributional conflicts that intensified in our country following the Great Depression of 1929-32 spawned numerous policies that became a burden on productive activity. Chile's per-capita income grew at a rate of 1.9% per year in real terms, between 1945 and 1970, while per-capita income in the rest of Latin America expanded at 3% per year and the world economy grew at an annual rate of 4%. Nonetheless, this sacrifice in terms of economic growth did not produce significant changes in income inequality. Although the data are too disperse to reach a definitive conclusion, everything seems to suggest that inequality by the end of the 1960s was not very different from the situation in the early 1940s. Slow growth lifted few people out of poverty; frustrations grew and society polarized. The 1970s and 1980s were marked by deep divisions among the Chilean people, and the country endured deep crisis. Structural economic change failed to raise Chile's per-capita income, which in the late 1980s was just 11% higher than in 1970, while inequality had increased.

Trade liberalization had given people access to more and better products, however. The proportion of households with at least one automobile had risen from 7.3% in 1970 to 21.3% by 1990. In the same period of time, the proportion with a television set had risen from 10.3% to 78.6%, and homes with a refrigerator had grown from 14.4% to 44.9%. The possibility of obtaining more material goods clearly increased the welfare of Chilean families, but it was essential for prosperity to be maintained over time. Democracy needed to be strengthened and, clearly, economic growth could contribute enormously to that. The structural reforms introduced by the authoritarian government followed by responsible economic leadership during the 1990s, supported by positive international conditions and a relatively harmonious political climate, were among the many factors that enabled Chile's economy to grow as never before in our history. Between 1985 and 1998, the income of Chilean families practically doubled. Between 1987 and 1998, two million Chileans ceased to be poor. Yet this rapid growth was not accompanied by a reduction in income inequality, and soon the "development model" began to be questioned. Doubts have been reinforced by the country's sluggish economic performance since 1998 and the persistent unemployment that has accompanied it.

It cannot be denied that the desire for equality is latent among the Chilean people, but there is no wish to sacrifice economic progress. These two demands are confused and intermixed among the population. Naturally, our political leaders see sharp inequalities in income and want to correct

them; but efforts to do so, unless well thought out, often end up undermining economic growth (Alesina and Rodrick, 1994), and hence also tax revenue and State action targeting the poorer segments of the population. The risks of redistributive adventures may have a very high social cost; hence the importance of correctly evaluating the policies to be pursued. It is essential to have a clear view of the country's distributive reality and the changes that have occurred in recent decades. This is the subject of this article. We aim to delve deeper into the trend of inequality over the last 40 years. Taking advantage of employment surveys carried out by the University of Chile, we will concentrate on wage inequality. Of course, we are not the first authors to look at this evidence (see Beyer *et al.*, 1999; Bravo and Marinovic, 1998; Ruiz-Tagle, 1999, among others), but we believe we can contribute a useful and also new perspective. In the following section we briefly review a number of studies that are relevant to research on income inequality in Chile. The third section explains the origin of the figures used in this study and makes a preliminary assessment of them. The fourth section takes an original look at the trend of wage inequality in Chile, and the fifth offers some conclusions.

2. A review of the literature

Income inequality has increasingly been attracting economists' attention. The ultimate cause of this interest stems from the clear tendency towards greater inequality that can be seen in the developed world, especially in the United States and the United Kingdom (Gottschalk and Smeeding, 1997). Research into this subject is assisted by increasing availability of information. The Chilean economy has continued to change in recent decades, but a long-term view suggests that the changes have been less significant than might be suggested by studying a few years in isolation (Cowan and De Gregorio, 1998). Naturally, however, opinions tend to differ in this area, depending on the emphasis placed by the observer. Some analysts claim that significant changes have taken place in the income distribution in Chile¹ in the long-term, but not in the medium and short-term (Marcel and Solimano, 1993; Contreras, 1996; Valdés, 1999). An interesting paper in this category is that by Ruiz-Tagle (1999), who sets up confidence intervals to analyze the trend of inequality between 1957 and 1998. He concludes

¹ Long-term analysis refers to Greater Santiago rather than to Chile as a whole, and is based on University of Chile employment surveys.

that changes from one year to another are not usually significant, as they fall within the confidence interval. Table 1 shows the trend of several inequality indicators in recent decades for Greater Santiago. Unfortunately it is impossible to make long-term comparisons at the national level. The impression is that at the end of the last century inequality in Chile was somewhat greater than in the 1960s,² but no different from the levels prevailing in 1980. On the other hand, in 1985 and 1990 the income distribution was significantly more unequal than in the late 1990s. Inequality grew in the 1980s as a result of a sharp rise in unemployment in those years and a significant drop in real wages, which, despite impinging on all social groups, had more serious effects on people with low-incomes (see figure 1).

Between 1981 and 1985 the hourly wage in the 10th percentile³ fell by 39%, whereas the equivalent fall in percentile 90 was just 21%. In 1990, the hourly wage in percentile 90 exceeded its real value in 1981 by 12%, while that of percentile 10 was still 13% below its 1981 level. The strong growth of the 1990s facilitated a rapid increase in wages at the lower levels, thereby reducing wage dispersion among the inhabitants of Santiago.⁴ Nonetheless, this dispersion was greater in the late 1990s than in the early 1980s. It is worth asking whether this emphasis on people's labor incomes has any justification; after all, income from capital is also a major proportion of national income.⁵ The fact that income from capital is distributed unequally is not in dispute; but it is not distributed very differently in Chile than elsewhere in the world. What is clear is that labor incomes are distributed much more unequally than in other countries.⁶ So it seems reasonable to focus the analysis on labor incomes.

This unequal distribution of labor incomes is magnified at the household level by factors that often are specific to our country.⁷ For example, the female market-market participation rate, which is surprisingly low in

² Differences in the Gini coefficient are statistically significant at 1% with respect to 1965, and at the 5% level with respect to 1970.

³ The wage rate that divides the lowest paid 10% of the population from the remaining 90%, measured in terms of the hourly wage.

⁴ This phenomenon did not extend nationwide. The CASEN surveys suggest that wage dispersion in the 1990s actually increased slightly (see Beyer, 2001).

⁵ In Chile, according to national accounts, wage incomes account for about 47% of national income (assuming indirect taxes are paid by capital and labor in proportion to their share of national income). Nonetheless, this factor underestimates the true share of labor: it does not consider the income of independent workers, nor does it take account of the fact that a large proportion of capital incomes are, strictly speaking, payments to labor. Profits earned by small and medium-sized businesses are an example of this.

⁶ For a more detailed analysis, see Beyer (2000).

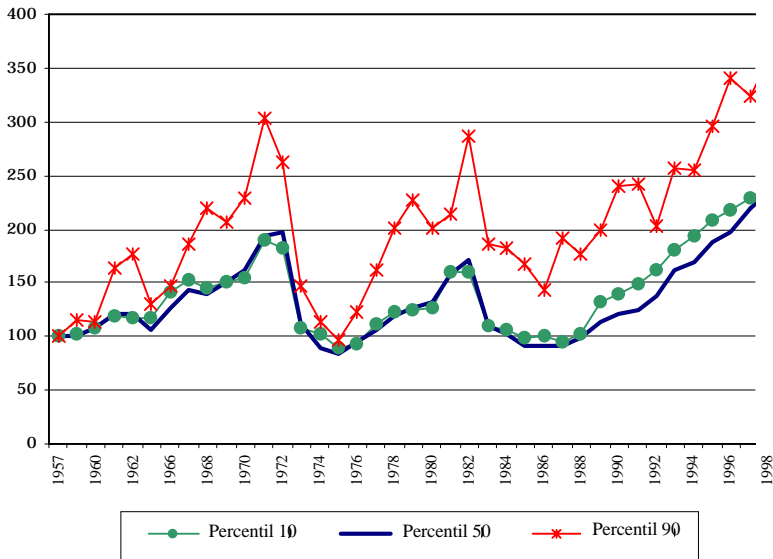
⁷ Cowan and De Gregorio (1996), Beyer (1997), Contreras (1996), Valdés (1999).

TABLE N° 1: HOUSEHOLD INCOME DISTRIBUTION: GREATER SANTIAGO
(Ranked by per-capita income)

	1965	1970	1980	1985	1990	1994	1998
Quintile 1	5.9	5.5	5.0	4.2	4.3	5.2	4.8
Quintile 2	11.6	9.3	8.7	8.4	8.1	9.6	8.7
Quintile 3	14.9	14.3	12.5	12.2	11.7	12.2	12.9
Quintile 4	19.7	19.6	20.3	20.7	18.3	19.0	20.7
Quintile 5	47.9	51.3	53.4	54.5	57.6	53.9	52.9
Gini	0.414	0.441	0.469	0.485	0.507	0.466	0.468
Ratio	8.1	9.3	10.6	13.0	13.5	10.4	11.1

Source: Prepared by the authors on the basis of employment surveys conducted in the month of June by the Department of Economics of the University of Chile. Figures are three-year averages centered on the year indicated.

FIGURE N° 1: TREND OF HOURLY WAGE
(Male wage-earners)



Chile, is significantly correlated with education levels. As a result, the poorest households on average have fewer income-earners per family member than those with higher incomes, thereby accentuating the income differences between the poor and the rich. The likelihood of unemployment is also correlated with an individual's education level. In the absence of generous unemployment insurance schemes, the effect of these differences in the unemployment rate magnify individual income inequalities in the household. Of course, differences in the fertility rate, which are also correlated with education, explain significant differences in family size, which means that economic differences between high- and low-income families increase in per-capita income terms. Analysis of the determination of labor incomes is usually based on the theory of human capital originally developed by Becker (1964) and Mincer (1974), or on further elaborations of those theoretical developments. This theory assumes that a worker's productivity, and hence income, is determined by his or her level of human capital; this, in turn, is based on skills acquired in formal education and those acquired informally (through work). Labor incomes therefore depend on the endowment of productive characteristics and their market return,⁸ which makes education an essential element in explaining changes in the income distribution.

The evidence in this field is interesting. Montenegro (1998) investigates whether there are differences in returns according to income percentile, and finds higher returns to education among the higher income groups.⁹ The evidence suggests that returns to education vary significantly from one level of education to another, so assuming a unique average private rate of return for all Chilean education would be mistaken (Beyer, 2000). Specifically, returns rise with years of education, such that university education has a greater marginal impact on wages than basic education. Similarly, Contreras (1996) shows that part of the differences in the trend of poverty and inequality is explained by regional differences in the return to education for the different education levels.

Bravo and Marinovic (1999) find that wage inequality has increased, and they separate changes in the distribution of labor income into changes in observable and non-observable variables.¹⁰ They show that the

⁸ This claim is not so obvious, but the empirical evidence suggests that investments in human capital yield varying returns.

⁹ This result is not that surprising, considering that inequality among the highest 10% of the income distribution is similar to that in the other 90%. The result merely corroborates this.

¹⁰ Through the Mincerian income equation they decompose the variance, calculating the percentage that is attributable to observable variables (education and potential experien-

behavior of wage inequality (an increase between 1974 and 1987, followed by a reduction between 1987 and 1996) can mostly be attributed to observable variables. As a result, it is reasonable to assume that variations in the return to education have played a major role in changes in wage inequality in our country. In fact, the study shows a significant increase in the relative demand for skilled labor, which is closely in line with results obtained in the United States (Katz and Murphy, 1992). A similar result, albeit for a shorter period, is obtained by Bravo et al (1999).

The work done by Pavcnik (2000) is particularly interesting, as it attempts to determine whether investment and the adoption of technology affects the relative demand for skilled workers in Chile. The study is carried out at plant level in manufacturing industry, covering the period 1997-1986. She finds a large degree of complementarity between capital and skilled labor, and between the latter and the use of imported materials, foreign technical assistance and patented technology. Of course, as the author herself points out, the causality could be in the other direction.¹¹

Another line of research arises from time-series analysis, which attempts to explain inequality trends through econometric techniques. These include studies by Marcel and Solimano (1993), Meller et al (1996) – the latter based on the previous work – and Beyer et al (1999). The first two authors focus on explaining how the share of total income obtained by the different income quintiles varies, based on macroeconomic and market-market variables (minimum wage), inflation, education and changes in economic structure. They find that education and inflation explain very little of the increase in income inequality observed since 1974.¹²

Beyer et al (1999), in particular, makes an empirical study of the relation between skill premia and trade openness. Underlying this analysis is evidence of the impact that changes in the returns to education have had on wage inequality. Based on the Heckscher-Ohlin theorem, they evaluate the impact on the wage differential between an individual with university studies and one with primary schooling, of trade openness, the relative price of textile goods (as a proxy for the prices of unskilled intensive-intensive goods) and the proportion of the labor force with university education (as a proxy for changes in the countries relative endowment of factors of produc-

ce) and the percentages attributable to non-observable variables in different years; they then differentiate the two years in order to attribute changes in inequality to one factor or the other.

¹¹ Nonetheless, complementarities between skilled labor and physical capital have also been found in the United States.

¹² Of course, as we pointed out earlier, it is debatable whether there has been a permanent change in income inequality during the period analyzed by the authors.

tion).¹³ They find a positive relation between trade openness and the wage differential, whereby additional openness is found to have increased wage inequality in Chile. Possibly hiding behind this relation is technological change biased in favor of skilled labor, or some change in the productive structure of the economy. The fall in the prices of unskilled intensive-intensive goods reduces the relative wage of the less skilled, in keeping with Heckscher-Ohlin. The increasing percentage of university graduates in the labor force reduces their relative wage.

Given the importance of education in income, and hence its influence on the income distribution, De Gregorio and Lee (1999) attempt to unravel the relationship between the two, using panel data taken from a sample of countries between 1960 and 1990. One of their conclusions is that higher population education levels reduce income inequality. The opposite occurs if there is greater dispersion in education. In addition, in keeping with other studies, they find that social policies do affect the income distribution. Another result, also highlighted in Beyer (2000), is confirmation of the existence of a Kuznets curve, in which the relation between a country's income level and its inequality displays an inverted U-shape. Nonetheless, they suggest that the majority of income inequality cannot be explained either by education or by social expenditure, or by the country's development level.

This review of the literature reveals that there is still a long way to go in understanding the causes behind the unequal distribution of labor incomes in Chile. As this is a situation that we also tend to share with the rest of the Latin American region, there are clearly common elements that should help us understand this uncomfortable distributive reality. In the next section we review Chilean experience over the last few decades. Our aim is basically to describe the changes that have occurred in wage inequality, rather than explain the high levels of inequality which seem always to have been with us to a greater or lesser extent.

3. The Data

As a source of information, this study uses the employment and unemployment survey for Greater Santiago that the Department of Econo-

¹³ This variable is obtained by estimating a Mincerian human capital model, with the natural logarithm of the hourly wage as dependent variable and a series of variables that have been shown to affect individual wages in other studies. The estimation includes dummy educational variables. The variable in question is constructed by taking the difference between the coefficient of the "complete university education" dummy and the "complete primary education" dummy.

mics of the University of Chile has been conducting ever since 1957. Our analysis studies the period from 1957 through 1999. Although the survey is carried out four times a year in March, June, September and December, we work with the June sample which provides additional data on labor and household incomes. The survey gathers information from about 11,000 people, both those active in the labor market and retirees. Our study only considers wage earners which the survey classifies as white-collar and manual workers. The analysis focuses on men, since female labor market participation is relatively low and has undergone significant changes during the period,¹⁴ both of which could affect and bias our comparisons. Naturally, the analysis excludes observations for which information on the variables studied is incomplete. These considerations ultimately result in a sample covering an average of 1,700 male wage earners in the period under analysis.¹⁵

In this study we attempt to explain the trend of the natural logarithm of the hourly wage.¹⁶ For this purpose we use information covering the whole wage distribution and focus our analysis on the path of percentiles 10, 50 and 90, which we take to represent the incomes of lower-income, middle-income, and higher-income workers, respectively.

Wages have been corrected for variations in inflation and are denominated in pesos at June 2000 prices. The deflator used was the consumer price index furnished by the National Institute of Statistics. For the period 1970-1978, we further apply the Cortázar and Marshall (1980) correction. This study does not break down inflation for the period 1971-1972.¹⁷ In order to ensure reliable indices for June 1971 and 1972, we use the correction proposed by Yáñez (1978), but as the latter is smaller than the Cortázar and Marshall version, we adjusted the Yáñez indices by the monthly difference between the two.¹⁸

Table 2 shows a number of indicators of the evolution of incomes and inequality in recent decades, based on data for greater Santiago. The behavior of the average annual percentage change in income has varied from decade to decade and between groups. In the 1960s, incomes increa-

¹⁴ See annex 1.

¹⁵ Annex 2 displays the total observations for each year and the sample used.

¹⁶ The hourly wage is defined as a worker's total monthly income divided by the number of hours worked per month, the latter being approximated as the number of hours worked in the week multiplied by four.

¹⁷ " [...] due to the absence of primary information that would make it possible to describe the differential effect of parallel markets in the various months", Cortázar and Marshall (1980).

¹⁸ Annex 3 shows the corresponding values.

TABLE N° 2: INDICATORS OF INCOME CHANGES AND INEQUALITY

	Annual average percentage change			Average for the ten years				
	Income percentile 10	Income percentile 50	Income percentile 90	Std. Dev. logarithm hourly wage	Coefficient of variation hourly wage	Difference percentiles 50-10	Difference percentiles 90-50	Difference percentiles 90-10
1960-1969	3.07	3.30	5.17	0.81	1.45	0.81	1.22	2.03
1970-1979	-2.37	-2.85	-1.45	0.83	1.29	0.84	1.26	2.10
1980-1989	-1.12	-2.03	-0.96	0.89	1.46	0.81	1.43	2.24
1989-1999	5.02	4.26	3.50	0.83	1.45	0.74	1.35	2.09

Source: Prepared by the authors on the basis of University of Chile Surveys of Employment and Unemployment.

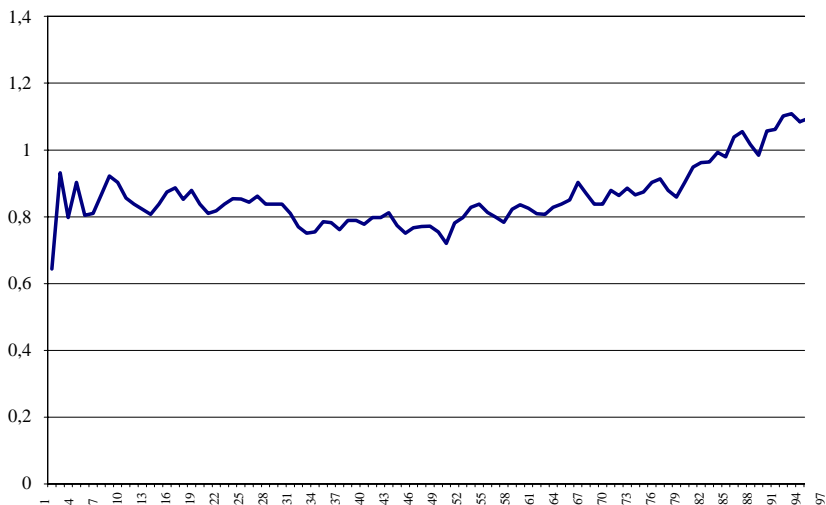
sed for all groups, but more for those earning higher incomes. In the ensuing decades, real wages fell in both the 1970s and 1980s, with wages of middle-income white-collar workers and those of manual workers declining most. Incomes grew again in the 1990s, but with the opposite pattern to that seen in the 1970s, namely, a smaller increase among higher income groups. These different patterns in income behavior generate different trends in inequality, measured in terms of the standard deviation of incomes, coefficient of variation and differences between the income percentiles.

4. What has happened with the wage distribution?

We saw in figure 1 that real wages in Chile display a rising trend over the last four decades, but with significant fluctuations, and sharp falls in some periods. Growth has not been uniform throughout the wage distribution. The highest skilled workers have obtained the largest increase – more than tripling their incomes since the start of the period – while the least skilled have experienced more modest growth, with incomes doubling since the early 1960s. This can be seen more clearly in figure 2 which records changes in the logarithm of the hourly wage for all income percentiles.

Without doubt there has been a major increase in wage levels for all income groups, but particularly those in the highest 25% of the distribution. While in percentile 50 the real hourly wage increased by about 120% over four decades, or at an average annual rate of 2%, the wages among the top 10% of the distribution grew on average by 200%, or at an annual rate of

FIGURE N° 2: VARIATIONS IN THE LOGARITHM OF THE HOURLY WAGE
(Whole distribution: 1960-1999)

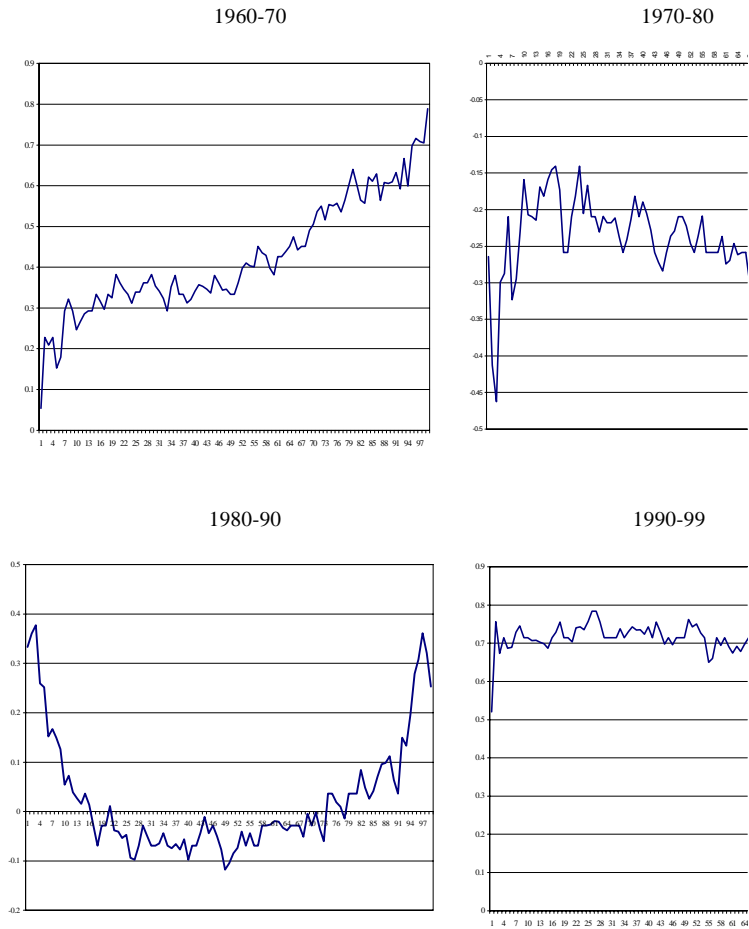


2.8%.¹⁹ Consequently, during the last four decades dispersion has increased in the upper part of the Chilean wage distribution. In the lower part of the distribution, as a result of the slightly larger wage increases among low income-income groups than among middle-income groups, the earnings distribution has narrowed. So, in the context of a generalized increase in wages in recent decades, there is a slightly larger increase at the extremes, especially among the highest income groups. The net result is that wage differences in the lower part of the distribution have narrowed whereas differentials in the upper part have widened.

This distributional reality is the result of a series of changes that have taken place over four decades, with considerable variation from one decade to the next, as shown by figure 3. Thus, it is surprising to see that in the 1960s there was a significant increase in wage dispersion, in the context of a general increase in wage levels. Whereas hourly wages in the lower part of the wage distribution grew at an annual average of 3%, wages among groups in the upper half of the annual distribution grew by 6% per year. This suggests that the relatively greater inequality seen in the 1990s

¹⁹ It should be recalled that the figure measures differences in the logarithm of the hourly wage for each income percentile, with the percentage differences calculated as follows: $(\exp(x)-1)*100$, where x represents the difference in natural logarithms of the hourly wage. This value is measured on vertical axis of figure 2.

FIGURE N° 3: VARIATIONS IN THE LOGARITHM OF THE HOURLY WAGE FOR DIFFERENT SUBPERIODS



compared to the early 1960s, cannot be attributed to economic changes introduced after the military coup of 1973, or to the sharp economic downturns of 1975 and 1982-83 (which did indeed increase inequality, especially through their effects on unemployment, but for a limited period only). Instead, it is the result of forces that were already present in the 1960s.

The high levels of inflation of the 1970s and the economic contraction in the middle of that decade caused real wages to fall significantly across all income groups. Although it is more difficult to discern a pattern

in this case, it can be argued that the worst hit were very low-income groups and those located around the third quartile (i.e. percentile 75) of the wage distribution. In the 1980s, on the other hand, the fall in real wages affected a broad group of wage earners, with only the extremes of the distribution bucking the trend. For those concerned, the drop in real wages was less than in the 1970s, and it is notable that the lowest paid managed to defend themselves from the fall in wages experience by middle-income groups. Possibly this was the result of the relatively inauspicious way in which the decade had begun (in the 1970s there was a major deterioration in real wages), or that the various employment programs of the 1980s established a wage floor that prevented further wage cuts. Lastly, the 1990s show not only a substantial increase in wages for all white-collar and manual workers in Greater Santiago, but there was also a narrowing of the upper half of the wage distribution, which suggests that strong economic growth not only has a significant effect on the population through its impact on wages, but it may also have a significant redistributive effect.²⁰

What underlies these changes in wage inequality? To answer this question, we firstly estimate a regression of the natural logarithm of the hourly wage on a series of independent variables covering individual characteristics that traditionally are considered as explanatory variables for the behavior of wages in empirical human capital models. Specifically, our regression includes a series of dummy variables that reflect the educational level attained by the interviewee.²¹ These variables have been fully interacted with the apparent experience of the individual and the square of that experience. The regression also included dummy variables controlling for the economic sector in which the individual works, and for the institutional nature of the employer (public or private). Estimates for different years enable us to evaluate whether changes in the wage distribution stem from changes between skill groups or within the different groups. The wages predicted from these regressions are used to estimate changes between groups, while the residuals are used to estimate changes within the different groups. Table 3 provides results of this exercise.

²⁰ Clearly, there is no conclusive evidence that economic growth reduces income inequalities. In fact, the nationwide CASEN survey does not show the same behavior. One could surmise, however, that economic growth has helped consolidate Chile's higher education system. This in turn, has led to an increase in the supply of workers with higher education, attracted by the high returns to this type of education. This could result in an incipient moderation in wage increases among the higher wage groups, which largely consist of university graduates, and hence a reduction in wage differences.

²¹ There are seven educational categories: without education, primary incomplete, primary complete (eight years), high-school incomplete, high-school complete, university and special education. In the regression we omitted the "without education" category.

TABLE N° 3: WAGE DISTRIBUTION IN CHILE: VARIOUS INDICATORS

	1960	1970	1980	1990	1999
Actual wages					
50-10	0.829	0.916	0.866	0.706	0.754
90-50	1.005	1.281	1.386	1.556	1.325
90-10	1.834	2.197	2.252	2.262	2.079
Variance	0.527	0.770	0.769	0.799	0.674
Predicted wages					
50-10	0.490	0.545	0.482	0.368	0.456
90-50	0.821	1.074	1.169	1.399	1.195
90-10	1.311	1.619	1.651	1.767	1.651
Variance	0.262	0.368	0.390	0.424	0.334
Residual					
50-10	0.599	0.692	0.756	0.703	0.675
90-50	0.651	0.769	0.718	0.786	0.718
90-10	1.250	1.461	1.474	1.489	1.393
Variance	0.265	0.402	0.379	0.375	0.340

Source. See text.

The figures show that the largest increase in wage inequality occurred in the 1960s.²² The variance of wages grew significantly between 1960 and 1970 by 46%. This major increase in wage dispersion during the 1960s stems firstly from changes in the variance within the different skill groups. The variance of residuals increases from 0.265 to 0.402, in other words by 52%. There was a notable increase in the variance between skill groups: the variance of predicted wages increases from 0.262 to 0.368, i.e. 40.5%, between 1960 and 1970. The increase in wage inequality during the 1960s, therefore, is mainly the result of the greater dispersion within the different skill groups.²³

An aspect that we would like to draw attention to in this analysis is the behavior of the public sector (probably one ought to speak more genera-

²² Again it is worth remembering that following the crises, especially in 1982-83, wage inequality increased sharply, but this seems to relate more to transitory rather than permanent changes. Accordingly, if we consider the changes in wage inequality around the beginning or end of the decade in years, apart from 1999 perhaps, that are reasonable from the economic point of view, we can gain a better idea of the factors behind these changes.

²³ Recall that our regression included different educational categories, experience, experience squared (the latter two fully interacted with educational variables), the economic activity in which the person works, whether the person worked in a public or private institution, and lastly, whether the interviewee was a head of household.

TABLE N° 4: VARIANCE OF WAGES (IN NATURAL LOGARITHMS) IN THE PUBLIC AND PRIVATE SECTORS

		1960	1970	1980	1990	1999
Public	Variance	0.4893	0.8260	0.8329	0.8045	0.7311
	Proportion	23.36%	23.58%	15.54%	10.56%	7.00%
Private	Variance	0.4820	0.6646	0.7527	0.7856	0.6573
	Proportion	76.64%	76.42%	84.46%	89.44%	93.00%

Source: Prepared by the authors on the basis of University of Chile Surveys of Employment and Unemployment

lly of the unionized sector) in the 1960s. Table 4 shows not only the variance of wages in the public²⁴ and private sector throughout the various years analyzed, but also the proportion of wage earners in Greater Santiago working in the public and private sectors.

The increase of nearly 70% in the variance of wages in the public sector explains much of the increase in wage inequality during the 1960s. In contrast, the variance of wages in the private sector increased by just 38%. The increase in wage dispersion in the public sector was so strong that it was never matched in the private sector throughout the period analyzed. Throughout the period public-sector wage dispersion remained higher than in the private sector. A possible explanation for the behavior of wages in the 1960s relates to the growing power that labor legislation was giving to the unions.²⁵ The public sector was no exception to this trend, so it should not be surprising that while private sector wages grew at 4% per year in the 1960s, public-sector wages rose at an annual rate of 5.3%. This reflects the pressure-group power enjoyed by public-sector workers. Unfortunately, the available information does not enable us to directly confirm whether the increase in wage dispersion in the 1960s stems from the growing power of unions, but the data presented are certainly consistent with this possibility. It may seem strange that unions have the capacity to increase wage dispersion when usually they are expected to reduce it; but if unionized workers basically come from the higher part of the wage distribution, income diffe-

²⁴ The survey distinguishes between fiscal institutions, public-sector bodies and public firms. We have grouped the whole public sector in a single category.

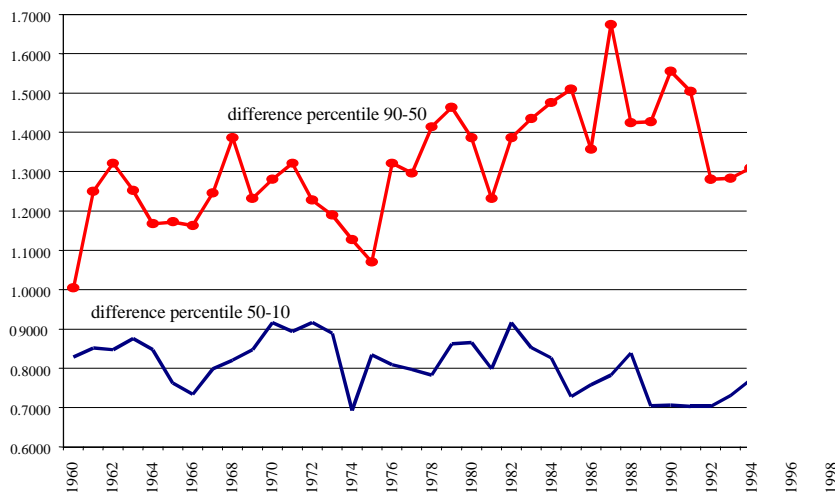
²⁵ For further detail on this see Coloma and Rojas (2000).

rences between those who earn more and those who earn less are liable to become more pronounced in the presence of unions.

The authoritarian government drastically reduced the power of the unions, especially in the public sector, where employment was also cut back sharply.²⁶ Curiously, this does not seem to have translated into a reduction in wage dispersion in the public sector, which is suggestive of wage inertia in this sector. The usual pattern of raising public-sector workers wages in equal proportions, in the absence of wage negotiations, may explain this inertia. Nonetheless, as wage dispersion in the public sector remained higher than in the private sector, the fall (increase) in the proportion of workers working in the public sector (private) should have caused a smaller variance of wages. This effect can be seen in a reduction in the variance of the residuals, i.e. the variance within the different skill groups. The effect is more than compensated by a major increase in the variance between skill groups (the variance of predicted wages rises significantly between 1970 and 1980, and from then to 1990), shown in table 4 as an increase in the private-sector wage variance.

The increase in the wage variance is basically explained by an increase in dispersion in the upper part of the distribution. Figure 4 shows the

FIGURE N° 4: TREND OF DIFFERENCES BETWEEN WAGE DISTRIBUTION PERCENTILES
(Differences of natural logarithm of the wage)



²⁶ Strictly speaking, union activity was suspended between 1973 and 1979.

evolution of differentials between percentiles 90 and 50 and between percentiles 50 and 10. It is clear that whereas in the 1970s and 1980s, the difference between percentiles 50 and 10 tends to diminish, the differential between percentiles 90 and 50 tends to increase.

Lastly, the 1990s saw a reduction both in the variance of predicted wages and in the variance of residuals, suggesting a reduction in the variance between skill groups, and within the different groups. Based on these figures we can distinguish three periods during the four decades. Firstly, the 1960s saw a major increase in variance both between and within skill groups. The two following decades display a weakening of the variance within skill groups but a slight increase between them. The final decade records a slight reduction in variance both between school groups and within them.

Figures 5, 6 and 7 summaries the reality described above. It should be recalled that the regression used to construct table 3 included various education categories among the independent variables, including primary, secondary (high-school) and university education. The figures show the changes in wages experienced by white-collar and manual workers with different levels of schooling in the periods defined earlier. The comparison is made between the percentiles of each wage distribution, i.e. the distribution of individuals with university, high-school and primary education respectively. To minimize possible errors arising from the small size of each sample, we use three-year averages to carry out this exercise. The figures show the middle year in each case; thus, 1970 indicates that the average of 1969, 1970 and 1971 has been taken to construct the 100 wage percentiles in each educational group. Figure 5, which corresponds to the 1960s, allows us to clearly verify that in that period wage dispersion increased within each educational group, and in general the higher percentiles saw their wages rise relatively more than the lower percentiles. This is particularly so between wage-earners with secondary and those with primary education. At the same time, the wages earned by university graduates grew faster than among other educational groups, thereby increasing the variance of wages between educational groups. During 1970-1988, all groups saw their real wages decline. The wages of individuals with more education fell less, thereby increasing dispersion between skill groups. But among wage earners with high-school and primary education, wage dispersion actually narrowed. Those earning most in each of the groups saw their wages fall relatively more than those earning less. Naturally, no-one is better off, but wage differentials have narrowed. This is consistent with the smaller varian-

FIGURE N° 5: TREND OF HOURLY WAGE:1958-1970
(By percentile and educational category)

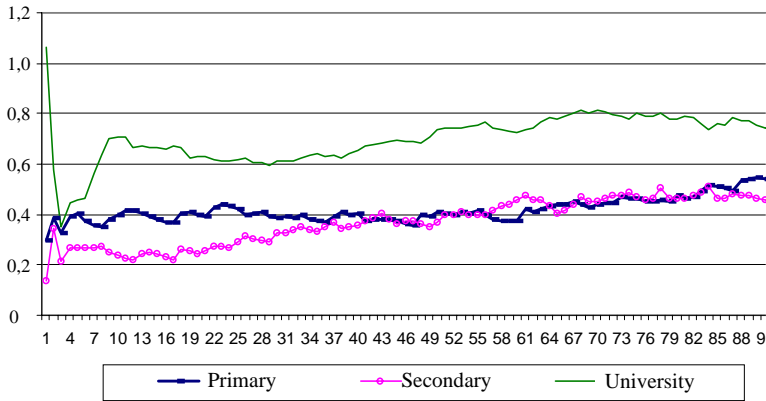
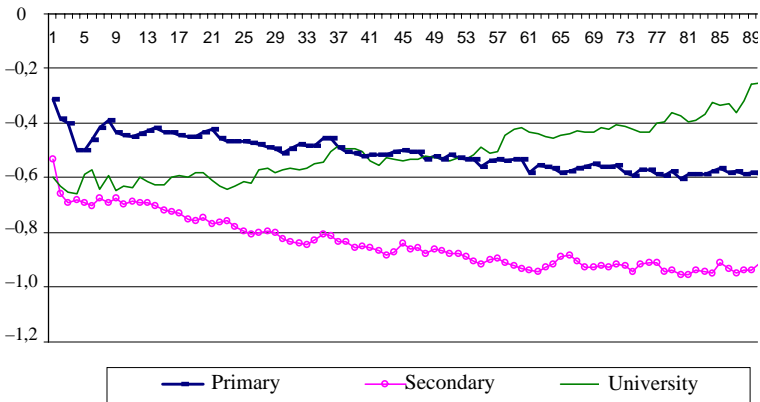


FIGURE N° 6: TREND OF HOURLY WAGE:1970-1988
(By percentile and educational category)



ce seen in the second period within the different skill groups. Lastly, figure 7 shows that wage dispersion diminished in all educational groups in the period 1988-98. In addition, the earnings of university trained professionals grew more slowly than those of other wage-earners, so the variance both between and within the different skill groups decreases. Figure 8 shows the changes in the wage distribution for the four decades analyzed.

FIGURE N° 7: TREND OF HOURLY WAGE:1988 - 1998
(By percentile and educational category)

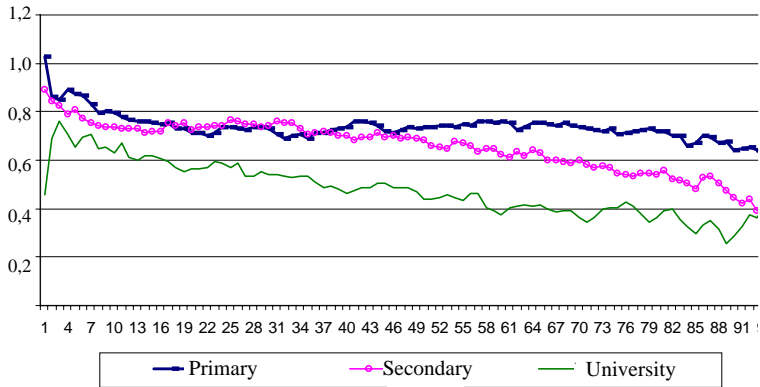
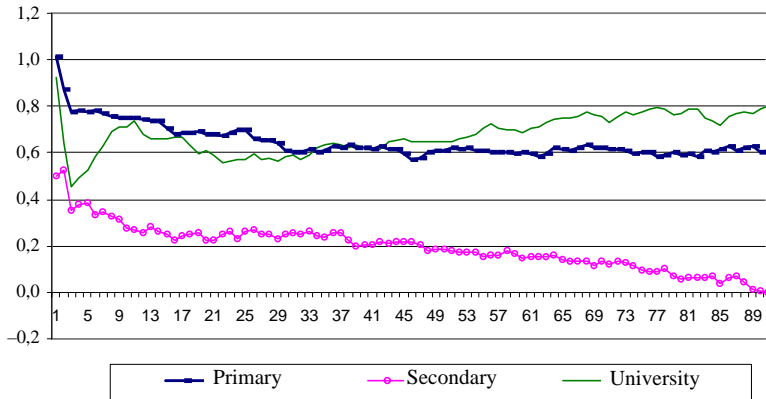


FIGURE N° 8: TREND OF HOURLY WAGE:1958-1998
(By percentile and educational category)

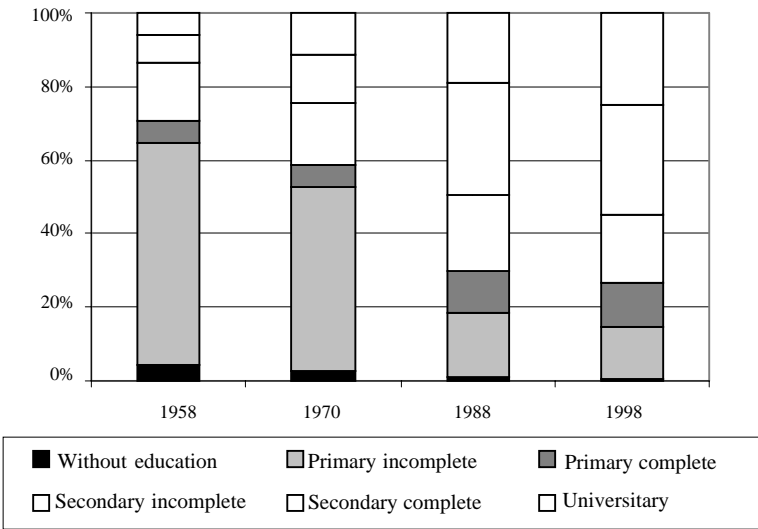


The overall picture to emerge from these four decades is surprising. Part of the greater variance between skill groups is explained by the slow growth of earnings among individuals with high-school education.²⁷ Moreover, in the upper percentiles of the distribution of wage earners with

²⁷ We say “part of the increase in the variance” because we are not considering all the independent variables included in the regression.

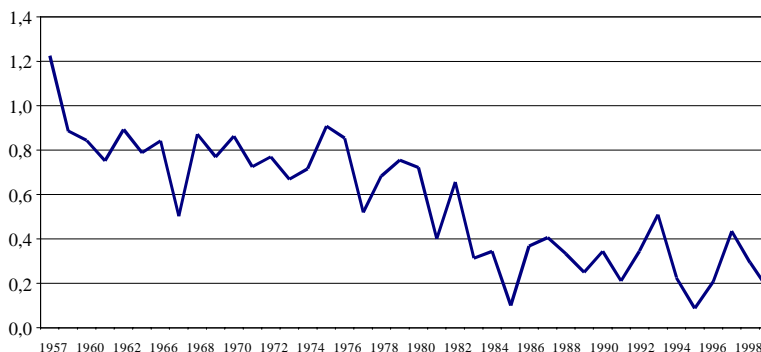
secondary education, wage increases over the 40-year period are slightly negative. Of course supply factors play a role here. As figure 9 shows, the proportion of high-school educated individuals has risen significantly over the last 40 years. But the proportion of the population with higher education has also grown significantly, without showing through in the trend of wages in this group (although at the end of the period it seems to be making its effects felt). Accordingly, there are demand factors that also explain the relative deterioration in the earnings of high-school educated workers.²⁸ People with primary schooling that earn most have also seen their wages deteriorate compared to individuals with higher education, but to a relatively small extent. From the standpoint of the individual deciding whether or not to invest in education, the secondary education “project” seems very unattractive unless the higher education alternative is considered at the same time. Thus it should not be surprising that the demand for secondary school students, including those going through technical-professional edu-

FIGURE N° 9: EDUCATION LEVEL OF WAGE-EARNERS IN GREATER SANTIAGO



²⁸ Bravo and Marinovic (1999), for example, argue that there has been an increase in the relative demand for skilled workers in Chile.

FIGURE N°10: DIFFERENCES IN LOG OF WAGES OF WORKERS WITH SECONDARY AND BASIC EDUCATION
(Corrected for experience)



cation, should be for higher education. Figure 10 shows how wage differentials between individuals with high-school education and those with basic education have narrowed.

In the 1960s an individual with high-school education typically earned more than twice the wage of someone who left the formal education system after primary school.²⁹ In the 1990s, they were earning just 35% more. What has been happening, then, is a convergence of the wages of individuals with high-school education towards those of individuals with primary education. In other words, the labor market distinguishes less and less between secondary school and basic education graduates. This is a phenomenon peculiar to the last two decades; whereas the 1960s clearly saw wage inequality climb to levels it would maintain during the two following decades, the determinants of this inequality are changing. In the 1960s there was a considerable increase in the variance both between skill groups and within the each of the groups; in the subsequent decades this gives way to a further increase in the variance between groups, largely resulting from slower wage growth among workers with secondary education, and a narrowing of the intra-group variance, which is incomplete because of the larger wage dispersion among university professionals towards the end of

²⁹ To reach this conclusion on the basis of the graph, recall that the graph represents the difference between the natural logarithm of the wage of an individual with secondary schooling and another with primary. Thus, the wage ratio is obtained by estimating e^x , where x represents the difference in the logarithms mentioned.

the 1990s, compared to the early 1960s.³⁰ Although the 1990s show a reduction in both the inter-group and intra-group variances, this is insufficient to compensate for the changes that took place in the preceding decades.

Another way of looking at changes in the wage distribution that enriches the above analysis is to determine the contribution to the trend of wage inequality made by changes in observed quantities, observed prices and unobserved prices. This alternative is particularly attractive in the case of Chile, where the simple human capital model generally captures the behavior of wages quite well.³¹

To perform this exercise we use a methodology originally developed by Juhn et al (1993). The key is to isolate the different effects, namely observed quantities, observed prices and non-observed prices. We start with a simple human capital model, such as represented in equation (1).

$$(1) \quad Y_{it} = X_{it} b + u_{it}$$

Where Y_{it} is the logarithm of the hourly wage of individual i in year t . X_{it} represents a matrix of individual characteristics, including experience, education and marital status. Lastly, u_{it} covers the unobserved part of the wage equation. For analytical purposes, we want to break this factor down into two elements: the individual percentile in the residual distribution which we shall call α_{it} , and the distribution function of the residuals from equation (1) which we call $F_t(\cdot)$. Using the definition of the cumulative distribution function, we then have

$$(2) \quad u_{it} = F_t^{-1}(\alpha_{it} | X_{it})$$

Where $F_t^{-1}(\cdot | X_{it})$ is the inverse of the cumulative distribution of residuals for workers with characteristics X_{it} in year t . In this framework, changes in wage inequality stem from three sources: changes in the distribution of the X , changes in the b , and changes in the distribution of the residuals. If we define an average price for the observables throughout the period (' b ') and also an average cumulative distribution for the period (' $F(\cdot | X_{it})$ '), then we can decompose the wage equation into different components as follows:

³⁰ Of course, the increase in the proportion of university professionals also has an influence.

³¹ Typically, a regression with the natural logarithm of the hourly wage as dependent variable, and education (or various educational categories), experience, experience squared, as independent variables, explains around 40% of the variation in individual wages.

$$(3) \quad Y_{it} = X_{it}'b + X_{it}'(b - b) + F^{-1}(q_{it} | X_{it}) + [F^{-1}(q_{it} | X_{it}) - F^{-1}(q_{it} | X_{it})] .$$

The first term of equation (3) captures the effect of a change in the distribution of the X , while holding prices constant. The second term captures the effect of a change in the b , holding the X constant. The final term captures the effect of changes in the distribution of the residuals from the wage equation. This decomposition makes it possible to reconstruct the shape that the wage distribution would adopt if any of its components were held constant. Specifically, if we left observable prices and the distribution of residuals constant, the wage equation would be determined by

$$(4) \quad Y_{it}^1 = X_{it}'b + F^{-1}(q_{it} | X_{it}).$$

Calculating the distribution of Y_{it}^1 for each year would enable us to attribute changes in inequality to changes in observable quantities. Analogously, if we want both observable prices and quantities to vary over time, but not the distribution of the residuals, we can estimate the wage equation as follows:

$$(5) \quad Y_{it}^2 = X_{it}'b + F^{-1}(q_{it} | X_{it}).$$

If we proceed in this way, the difference between Y_{it}^2 and Y_{it}^1 can be attributed to changes in observable prices. Any additional change in inequality that results from comparing the effective distribution with Y_{it}^2 should be attributed to changes in the distribution of non-observables. This is the exercise we carry out below. The average b correspond to different periods analyzed. Table 5 gives the results of this decomposition for the last four decades. Tables 6, 7 and 8 show the results for different periods.

Table 5, corroborates what we have been saying. Wage dispersion increased significantly over the last four decades, widening the differential in hourly wage between an individual in percentile 90 and someone in percentile 10 by 40%. The difference between percentiles 90 and 50 increased by 47%. The wage of an individual in percentile 90 rises from just over six times higher than someone in percentile 10 to nearly nine times higher. This increase is explained exclusively by the behavior of the upper part of the distribution, given that the wage differential between percentiles 50 and 10 narrowed by 6.3%. The main factors behind this increase in wage dispersion are observable prices, in other words the premium paid to observable skills such as education. This increased premium is concentrated particularly in the upper part of the distribution, and in fact its trend in the lower

TABLE N° 5: BREAKDOWN OF SOURCES OF CHANGES IN THE WAGE DISTRIBUTION:
PERIOD 1958-1998*

Percentiles	Period 1958-1998			
	Effective difference	Quantities	Prices	Nonobservables
90-10	0.333	0.046	0.170	0.116
50-10	-0.054	-0.102	-0.127	0.189
90-50	0.386	0.161	0.298	-0.073

* Corresponds to middle year of three-year averages.

TABLE N° 6: BREAKDOWN OF SOURCES OF CHANGES IN THE WAGE DISTRIBUTION:
PERIOD 1958-1970*

Percentiles	Period 1958-1970			
	Effective difference	Quantities	Prices	Nonobservables
90-10	0.334	0.075	0.134	0.125
50-10	0.028	-0.060	0.025	0.063
90-50	0.305	0.135	0.109	0.062

* Corresponds to middle year of three-year averages.

TABLE N° 7: BREAKDOWN OF SOURCES OF CHANGES IN THE WAGE DISTRIBUTION:
PERIOD 1970-1988*

Percentiles	Period 1970-1988			
	Effective difference	Quantities	Prices	Nonobservables
90-10	0.170	-0.033	0.138	0.065
50-10	-0.087	-0.139	0.010	0.042
90-50	0.257	0.106	0.128	0.023

* Corresponds to middle year of three-year averages.

TABLE N° 8: BREAKDOWN OF SOURCES OF CHANGES IN THE WAGE DISTRIBUTION: PERIOD 1988-1998*

Percentiles	Period 1988-1998*			
	Effective difference	Quantities	Prices	Nonobservables
90-10	-0.179	0.029	-0.116	-0.092
50-10	0.000	0.071	-0.027	-0.043
90-50	-0.179	-0.042	-0.089	-0.049

* Corresponds to middle year of three-year averages.

part of the distribution contributes to reducing wage dispersion. Observable quantities do not seem to have had a major effect on wage dispersion, although the behavior of these quantities varies significantly within the distribution. While the trend of quantities (years of schooling, for example) helps to compress the lower part of the wage distribution, it magnifies wage inequalities in the upper part of the distribution. This suggests that educational differences between wage earners in percentile 90 and those in percentile 50 widened during the period under analysis, unlike educational differences between percentiles 90 and 10. This suggests the existence of some type of barrier to increasing education among middle-income groups. Lastly, there seems to have been a non-negligible increase in the premium to non-observable skills which is particularly noticeable in the lower part of the distribution. This is compensated, however, by a reduction in premia to observable skills and by smaller differences in quantities.

Table 6 summarizes the changes that took place in the 1960s and shows that they were of a similar magnitude to changes that occurred in the four decades analyzed. There are significant differences, however, with respect to table 5. Dispersion is slightly less in the upper part of the wage distribution. At the same time the increase in the premium to observable skills is a significantly less, and the increase is distributed rather more homogeneously throughout the distribution. Lastly, the increase in the premium to non-observable skills is greater in this decade than in the four decades taken together. The period 1970-1988 has its own peculiarities. Wage differentials increase still further between percentiles 90 and 10, mainly because of greater dispersion in the upper part of the distribution which, in turn, is explained almost equally by changes in observable quantities and by further increases in premia to observable skills. The final period shows a decline in wage inequality in Greater Santiago of a similar magni-

tude to the increase recorded during the two preceding decades. The reduction in wage dispersion in the 1990s is explained exclusively by a narrowing of the 90-50 percentile differential. In this case, a narrowing of the premium paid to observable skills plays a very important role.

Changes in wage inequality display different characteristics over time. Changes in the premium to non-observable skills have been essential in explaining changes in wage dispersion, and the effect on wage inequality of premia paid to non-observable skills has been considerable, especially in the 1960s. This phenomenon is compatible with the hypothesis that growing union power may have served to increase wage inequality, which the laws granting such power possibly were intended to correct. All of this suggests that changes in wage inequality are complex, difficult to explain and impossible to attribute to a single factor. It should also be mentioned that changes in observable quantities also help to explain changes in wage inequality. In our opinion, these quantities are fundamentally explained by education and experience. In what follows, we want to refer to the behavior of education, in which there are some interesting elements. Figure 11 shows the trend in average schooling among wage earners in Greater Santiago. Average schooling has increased by a slightly over four years during these four decades, rising from an average of 6.8 years in the early 1960s to 11.2 years today. Initially this increase in the average schooling of wage earners seems to have been the result of a significant increase in schooling among a small segment of the population, accompanied also by an increase in the dispersion of education, as shown in figure 12.

During the last few decades alone educational differences among the population have reduced significantly. Nonetheless, this seems to be the result of having managed to increase the education level of those with least

FIGURE N° 11: AVERAGE SCHOOLING OF MALE WAGE EARNERS IN GREATER SANTIAGO

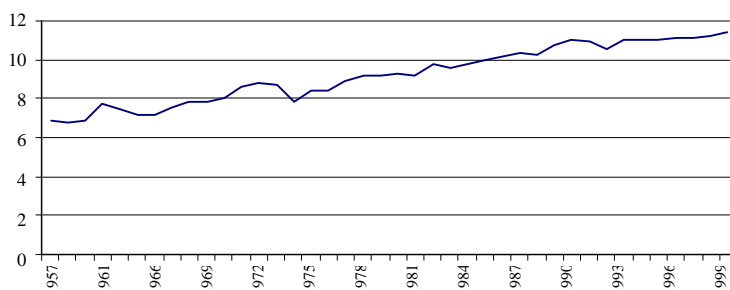
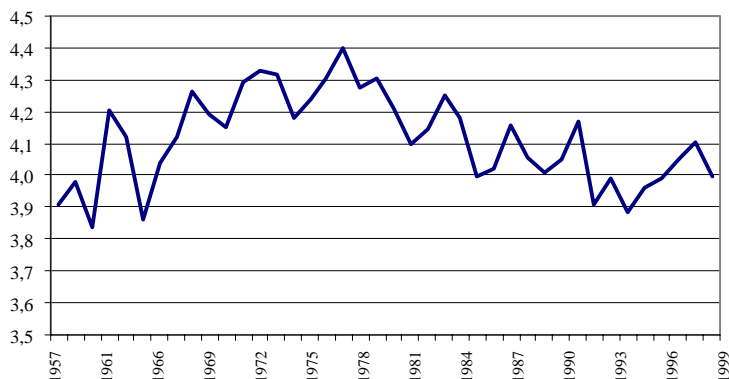


FIGURE N° 12: DISPERSION OF HIGH-SCHOOL EDUCATION MEASURED BY STANDARD DEVIATION



schooling. Table 9 clearly shows that the average years of schooling has increased significantly for all groups. The largest increase occurred in the lowest income groups in the distribution.³² This has enabled them to close the educational gap with respect to wage earners located around the 50th percentile. Nonetheless, the gap between wage earners located around percentile 50 and those in the region of percentile 90 has not closed; in fact it has actually widened. Differences of just under five years of schooling in 1958 have grown to seven years today. But, perhaps most importantly, whereas percentile 50 still remains at high-school education levels, wage earners in percentile 90 have gone beyond this level of schooling to complete higher education courses. This magnifies wage differentials between the two groups not only because of the effect on incomes of having completed more years of schooling, but also because there are significant differences in the returns to each education level in Chile.³³ Accordingly, for analytical purposes, two effects on income can be distinguished as a result of the increased level of schooling. The first stems from the change in quantity – in the number of years’ difference – which can be referred to as a “pure quantity” change. The second stems from the fact that an additional year of education generates a larger wage differential if it involves moving from

³² It is not particularly surprising, therefore, that these groups have experienced greater wage increases than middle income groups.

³³ Returns differ and display a rising structure; in other words, the returns to primary education are smaller than those to secondary education, and these in turn are less than those obtained from university education. See Beyer (2000) for a more detailed analysis of this result.

TABLE N° 9: YEARS OF SCHOOLING AMONG DIFFERENT GROUPS OF THE WAGE DISTRIBUTION

	Percentile 10	Percentile 50	Percentile 90
1958	3.5	6.3	11.1
1998	8.7	9.5	16.5

primary school to high-school education, and particularly from secondary to higher education, than if the additional year occurs within the same education level. We shall refer to this as a “level effect” to distinguish it from the “pure quantity” effect. Applying this distinction it is very likely that the relatively major impact of changes in observable quantities on wage differences (recall table 5) is biased, because it includes a level effect which, strictly speaking, relates more to what we understand as a return to education rather than increase in years of schooling. This suggests that such increases will do little to reduce educational inequalities unless the returns to the different types of education are made more uniform or the schooling level of middle-income groups in the wage distribution is raised well beyond secondary education. The challenges are enormous in either case.

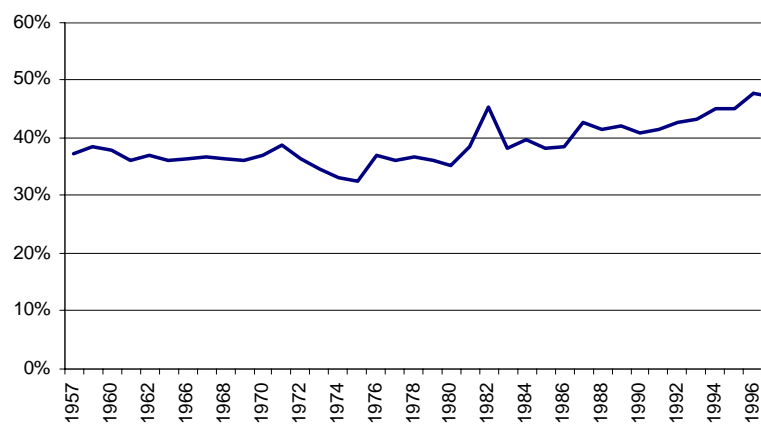
5. Conclusions

We have attempted to make an exhaustive analysis of the changes that have occurred in the wage distribution in Chile over the last four decades. Our analysis stands alongside those of other authors that have undertaken similar tasks. Some of the results obtained have been surprising – particularly the fact that wage inequality increased significantly in the 1960s. The data analyzed do not tell us for certain what it was in that decade that caused such a large increase in wage inequality, but it is notable that it was spearheaded by the public sector. It is reasonable to speculate that the growing power acquired by unions in this period was behind the increase. Insofar as labor unions consist of workers located in the upper part of the wage distribution, an increase in their bargaining power could lead to greater wage inequality. Nonetheless, we wish to leave this merely as a possible explanation, rather than as a confirmed statement. In the two following decades, inequality remained at similar levels to those prevailing by 1970, with transitory but significant increases during periods of economic crisis. In the 1990s, on the other hand, wage inequality decreased, but not enough to offset the changes that had occurred in the 1960s.

It is noteworthy that the changes recorded in the wage distribution are concentrated in the upper part of the distribution. In the lower part, wage differentials actually narrowed, especially as result of the sharp increase in schooling among the lowest paid. Differences in schooling in the upper part of the distribution, on the other hand, actually increase. The impact of this on wage dispersion is also magnified, because wage earners in the upper part of the wage distribution progressed from high-school education to university education in the last four decades, while those in percentile 50 are still not competing high-school. As the premium to high-school education fell significantly in the same period, while the return to tertiary education increased, the impacts on wage dispersion are enormous.

The situation of high-school educated wage earners is particularly worrying. Their wages seem to have leveled out with those of workers only with basic education. The effect is so strong that wage earners with this type of education that earn most have seen their real wages fall in the last four decades. It is clear that the labor market distinguishes less and less between workers with basic education and high-school graduates. This raises a challenge that cannot be eluded. The demand for young people with higher education will continue to grow. Moreover, those who do not see higher education as a possibility will not have much incentive to complete high-school, which will make it more difficult to reduce the still large educational differences that exist among Chilean people. Will wage differentials in Chile narrow? Unless educational differences narrow and differences in the returns to the different types of education become more uniform, this goal will be impossible to achieve. Changes in wage inequality will inevitably be linked to what happens with education in Chile.

ANNEX 1:
Trend of female labor market participation rate



ANNEX 2:
Total number of observations and sample used

	Total	Hombres	Empleados	Obreros	Total muestra
1957	10.756	4.902	792	1.124	1.607
1958	10.556	4.797	646	1.107	1.374
1960	10.197	4.575	689	999	1.340
1961	11.312	5.135	789	1.013	1.448
1962	12.360	5.647	825	1.096	1.585
1965	14.759	6.885	996	1.452	2.038
1966	14.680	6.889	1.027	1.434	2.043
1967	15.944	7.432	1.176	1.577	2.224
1968	14.834	6.939	1.147	1.300	1.988
1969	14.167	6.585	1.105	1.240	1.897
1970	14.536	6.816	1.186	1.276	1.931
1971	15.976	7.541	1.446	1.117	2.142
1972	14.659	6.949	1.370	1.051	2.040
1973	14.977	7.163	1.386	1.103	2.128
1974	12.831	6.166	946	1.181	1.619
1975	14.539	7.039	1.159	1.218	1.785
1976	13.824	6.558	960	1.203	1.582
1977	14.230	6.692	1.043	1.323	1.867
1978	14.643	6.951	1.081	1.293	1.840
1979	14.627	6.999	1.094	1.295	1.881
1980	12.699	6.066	919	1.163	1.661
1981	12.833	6.096	940	1.246	1.802
1982	12.801	6.009	956	1.266	1.485
1983	12.473	5.942	918	1.273	1.457
1984	12.520	5.983	882	1.223	1.591
1985	12.625	5.988	934	1.245	1.680
1986	12.381	5.800	931	1.181	1.621
1987	12.273	5.817	956	1.170	1.665
1988	12.115	5.802	909	1.188	1.681
1989	11.806	5.597	973	1.181	1.657
1990	11.716	5.590	988	1.135	1.606
1991	11.939	5.757	1.051	1.140	1.693
1992	11.507	5.567	986	1.182	1.671
1993	11.287	5.405	1.025	1.158	1.698
1994	11.456	5.476	1.098	1.142	1.590
1995	11.184	5.301	1.032	1.036	1.526
1996	11.235	5.422	1.085	1.076	1.490
1997		5.371	608	989	1.537
1998	11.268	5.456	930	1.205	1.369
1999	11.297	635	954	1.231	1.280

ANNEX 3:
Adjustment to convert to pesos at June 2000 prices

<i>1957</i>	2.754.569,60
<i>1958</i>	2.291.639,92
<i>1959</i>	1.637.941,08
<i>1960</i>	1.499.700,08
<i>1961</i>	1.378.530,45
<i>1962</i>	1.243.338,77
<i>1963</i>	848.031,50
<i>1964</i>	572.121,45
<i>1965</i>	438.701,47
<i>1966</i>	360.348,75
<i>1967</i>	303.087,80
<i>1968</i>	239.695,23
<i>1969</i>	180.544,31
<i>1970</i>	137.739,40
<i>1971</i>	106.385,40
<i>1972</i>	65.620,08
<i>1973</i>	12.898,57
<i>1974</i>	1.651,68
<i>1975</i>	317,87
<i>1976</i>	97,31
<i>1977</i>	44,08
<i>1978</i>	29,43
<i>1979</i>	21,83
<i>1980</i>	15,81
<i>1981</i>	13,07
<i>1982</i>	12,54
<i>1983</i>	9,48
<i>1984</i>	7,95
<i>1985</i>	5,88
<i>1986</i>	5,01
<i>1987</i>	4,21
<i>1988</i>	3,64
<i>1989</i>	3,14
<i>1990</i>	2,51
<i>1991</i>	2,03
<i>1992</i>	1,77
<i>1993</i>	1,57
<i>1994</i>	1,39
<i>1995</i>	1,29
<i>1996</i>	1,19
<i>1997</i>	1,13
<i>1998</i>	1,08
<i>1999</i>	1,04

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