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ASSESSING THE DECLINE OF WAGE DISPER-SION IN SWEDEN

by

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Assessing the decline of wage dispersion in Sweden

During recent years more and more economists and politicians have become concerned about the functioning of the labor markets in the Western countries. When looking for causes of rising unemployment and low economic growth, the lack of flexibility of the labor markets has been put forward as one of the candidate explanations.

Although Sweden has not experienced the same increase in unemployment as many other European countries, labor market flexibility has nevertheless been intensively discussed. One of the reasons for this is that sluggish economic growth and declining job mobility have coincided with decreasing wage dispersion.

For an economist the importance of wages for efficiently working labor markets is obvious. Wage differentials provide incentives to move from low-paying and inefficient firms to modern and high-paying firms. If wages in various industries deviate from the "market-clearing" levels, structural unemployment is likely to arise.

Strong reasons exist to believe that egalitarian rather than efficiency considerations have influenced the Swedish wage formation process. Most of the wage increases have been determined in central negotiations between the unions and the employers federations. In these negotiations the unions have struggled hard to realize the aims of the solidaristic wage policy, namely general reduction of wage differentials between industries, firms and individuals. Even though the additional wage drift

might have been more influenced by traditional market forces, the basic hypothesis remains that the flexibility of the Swedish labor market has deteriorated.

The solidaristic wage policy has become a central part of "the Swedish model" during the last decades. In a sense it has become one of the institutional rules governing the wage formation process. The EFO-model - see the contribution by Turner in this yearbook - is partly based on the principles of the solidaristic wage policy. The extensive labor market policy measures have been implemented by the government to mitigate the labor market problems caused by the wage policy.

Clearly the consequences of the reduced wage dispersion need to be examined. Despite a rather intensive political discussion little scientific effort has been devoted to such analyses. The purpose of this article is to take a first step towards more elaborate studies of the changing wage distribution in Sweden. Micro data bases of representative samples of the Swedish population from 1968, 1974, 1981 and 1984 will be used to describe the nature of the changes which have taken place in the wage structure. The Level of Living Survey - conducted by the Institute of Social Research at the University of Stockholm - are used for 1968, 1974 and 1981. The HUS-data - collected by IUI in cooperation with the University of Gothenburg - are used for 1984. Currently - spring 1986 - a second wave of interviews of the households belonging to the HUS-sample is in progress. Future research at IUI of the issues raised in this article will be based on the HUS-panel.

The age-wage profile

A first dimension in which changes of the wage structure have taken place is age. This can be seen in Figure 1 where actual wages in various age intervals are presented for the four years.

Figure 1 Wages in various age intervals
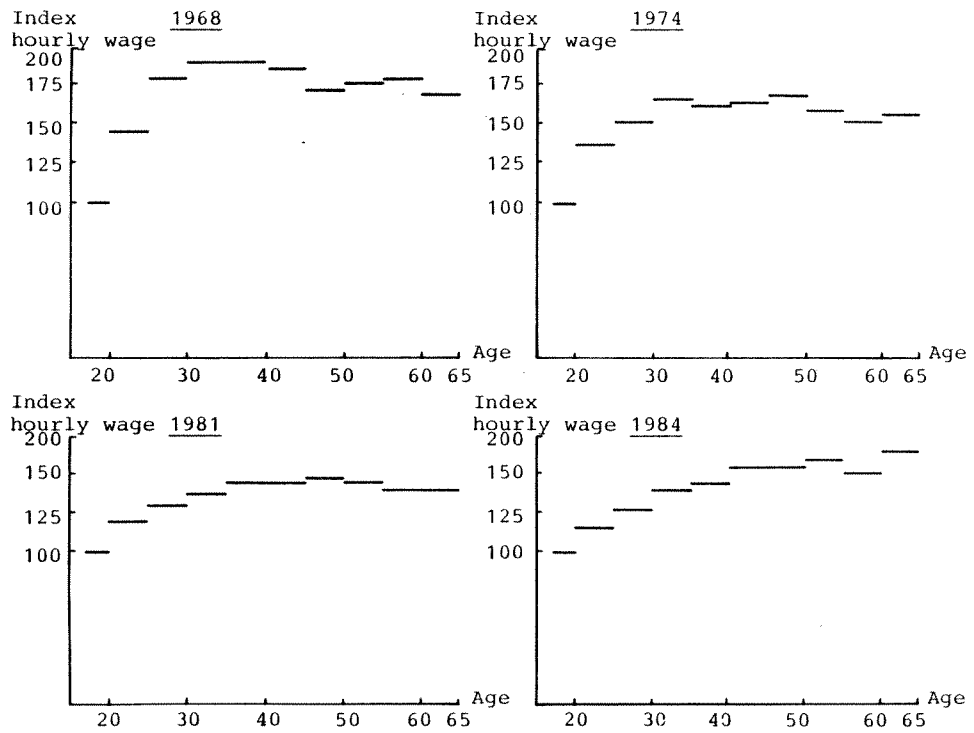
The age profile has gradually become less and less steep from the 1960's to the 80's. In 1968, the hourly wage for prime-aged workers (30-45 years) was almost twice as high as the wage for teenagers, whereas the corresponding wage differential in the eighties had declined to around 50 percent.

Another noteworthy point is the gradual change in the relative positions of the prime-aged and elderly workers. In 1968, average wage levels peaked between 30 and 40 years of age followed by a decline for the elderly; in 1984, the peak could be found instead among the 61-65 years old.

These changes of the age-wage pattern can, of course, have many causes. It might be that age per se has been valued in a different way in the labor market. It might be that the accumulation of "human capital" by means of work experience has changed. In order to shed more light on the nature of the age-wage patterns, a standard type of wage equations has been estimated on the data for the respective years.[1]

In these equations both age and work experience are allowed to have separate effects on wages, in addition to schooling and sex. The estimated equations can be used to predict the wage differentials between individuals of different age and with different amounts of work experience and schooling.

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[1] The following specification has been used:

Logarithm of
hourly wage = $\alpha_0 + \alpha_1$ (age) + α_2 (age squared) + α_3 (years of work experience) + α_4 (years of work experience squared) + α_5 (years of schooling) + α_6 (woman)

Figure 2 displays the predicted wages for individuals with continuous work experience - i.e. those who have worked continuously since the end of school at the age of 16 - and for individuals without any work experience. We start by looking at the lines describing the wages for individuals without any work experience. These lines describe the separate effect of age on wages. It appears that something has happened in this respect. Both in 1968 and in 1974 a peak could be found at around 45 years of age followed by a marked decline. In the 80's the age pattern has changed; in 1984 wages are increasing with age over the whole interval 16-65 years.

Figure 2   Predicted wages for individuals with (i) 9 years of schooling and continuous work experience from the age of 16 and (ii) 9 years of schooling and no work experience
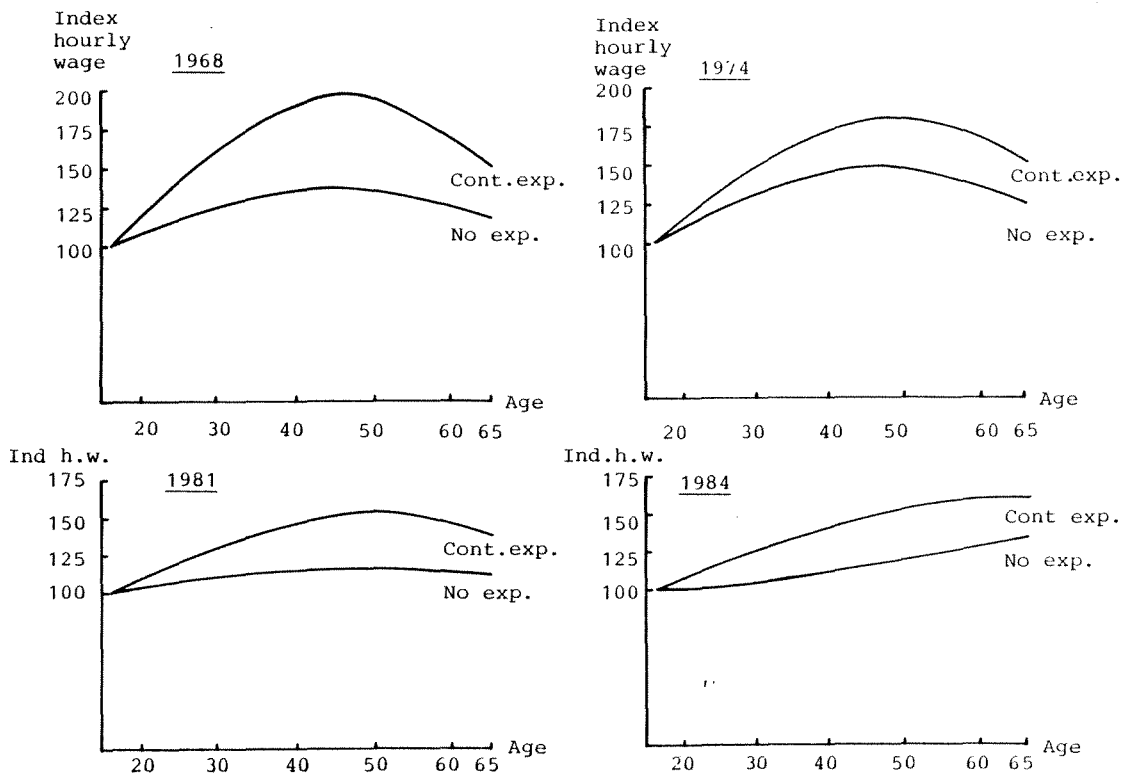
Obviously age _per se_ has been valued in another way
in the 80's compared to the 60's.

What about the separate effects of work experience?
The wage differentials between workers with con-
tinuous labor force participation and workers with-
out experience have also changed. This can be seen
in Figure 2, but the relative differentials are
explicated in Figure 3.

**Figure 3 Relative wages between workers with con-
tinuous labor force participation and
inexperienced workers**
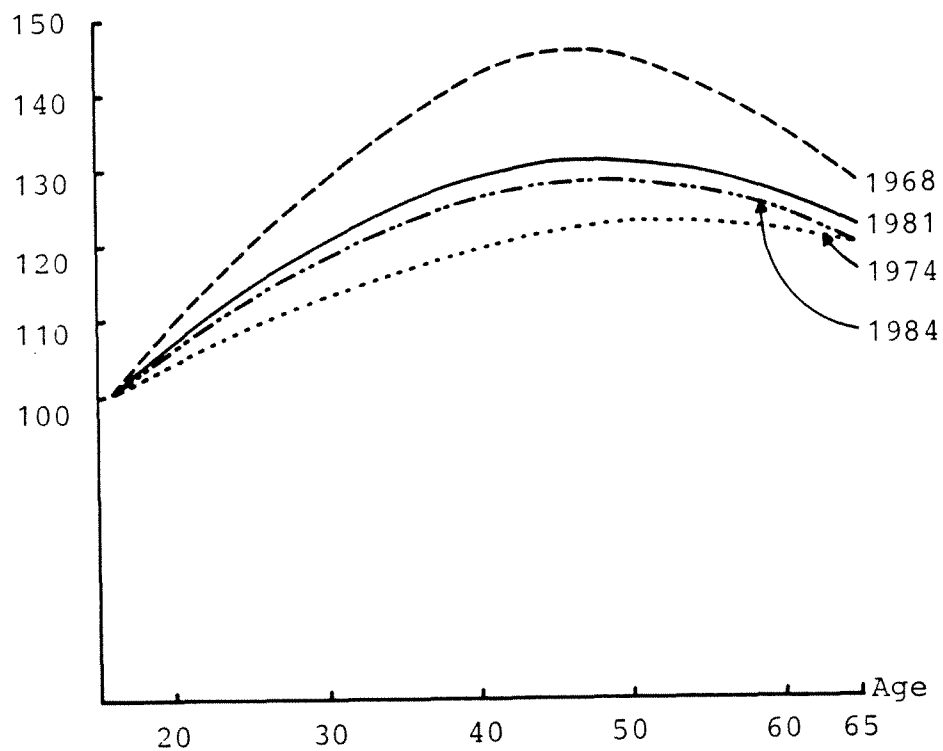
The most notable change is that the relative advan-
tage of being an experienced worker has declined
since the sixties. Another change is that the
marked peak in the profile which could be found in
1968 has almost disappeared. As shown in Figure 3
the relative advantage of work experience reached a
peak at approximately the age of 45 years, i.e.,
after about 30 years of work experience. The reason
is that the estimated relationship between wage and
work experience for 1968 implies that additional
work experience has a positive impact on wages
during the first 30 years and then turns into a
negative one.

The traditional "human capital" or "learning-by-
doing" interpretation of the effect of work experi-
ence on wages is that the effect should be un-
ambigously positive. Clearly our data contradict
this theory.

The only way to explain this is that many jobs are
physically demanding and therefore have a deleteri-
ous effect on the physical health and earnings
capacity of the workers. If the number of physi-
cally demanding jobs has decreased since the 60's,
this can explain the change of the wage experience
profile which has taken place. This interpretation
is in conformity with the conclusions in IUI's last
long term survey[1], where it is argued that activi-
ties like marketing, research and product develop-
ment are becoming more important in Swedish indus-
try.

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[1] Att rätt värdera 90-talet (Evaluating the 90's),
IUI 1985.

How can these changes in the structure of wages be interpreted in terms of equality and efficiency? In a mechanical sense equality has increased, because the changes demonstrated above have definitely contributed to reduced wage dispersion among all employees. On the other hand, it is not obvious that the flatter age-wage profiles have resulted in more equally distributed incomes over the life cycles.

It is hard to believe that these changes are compatible with market clearing wages for labor of various age and experience. In particular, it is hard to believe that the strong decline in the valuation of work experience is a result of traditional market forces. In general, it seems plausible that jobs and tasks have become more complicated during the last decades, and would therefore require more work experience than before. More detailed research is of course needed for reliable answers to these questions.

Educational wage differentials

It is a common opinion that wage-differentials between groups with long and short educations have diminished in Sweden. It has often been argued that those with university degrees have been the "losers" in terms of wage increases during the seventies. This opinion is confirmed by the information provided in Figure 4. The wages predicted by the wage equations for individuals with 9 and 15 years of schooling, respectively, are presented. In both cases continuous work experience from the end of school (16 and 22 years of age, respectively) are assumed.

Figure 4 shows that a marked decline in the wage differentials has taken place. Furthermore, it seems as if most of the relative improvement for those with low schooling took place between 1968 and 1974.

Figure 4   Predicted wages for individuals with (i) 15 years of schooling and continuous work experience from the age of 22, (ii) 9 years of schooling and continuous work experience from the age of 16
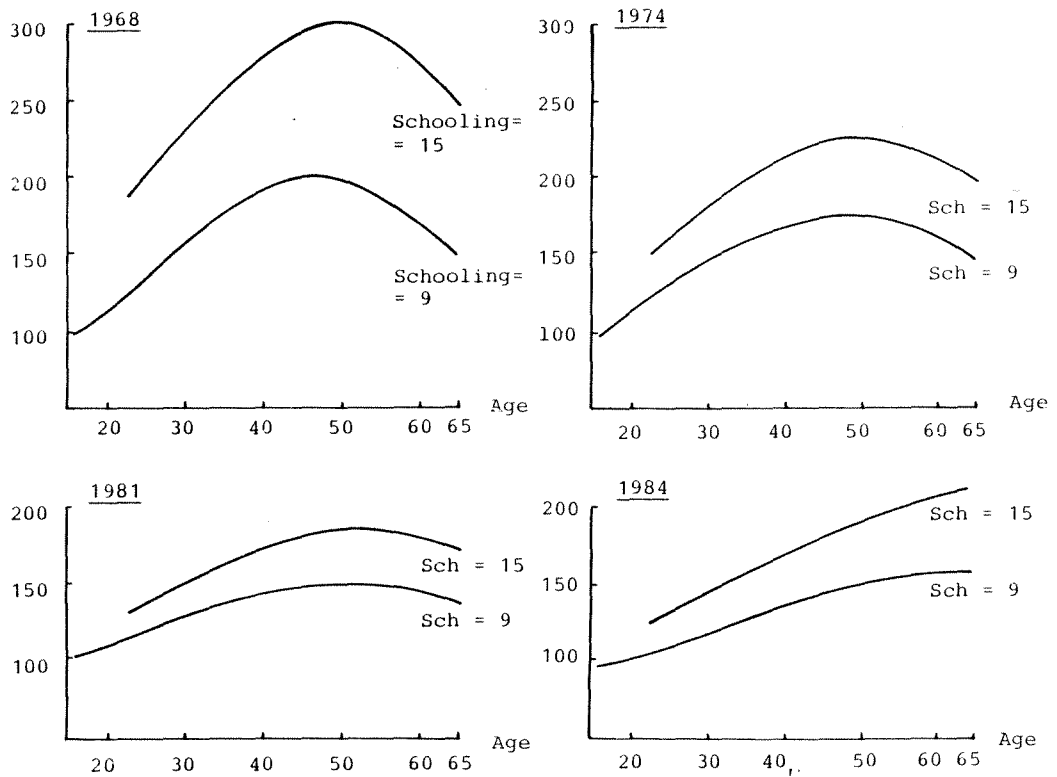
The first conclusion suggested by these figures is
that the "returns to schooling" have declined
sharply. Sweden experienced an "educational explo-
sion" in the 1960's. The compulsory length of
schooling was extended to nine years and higher
fractions of each cohort continued to high-schools
and universities. This development was stimulated
by more generous financial support for students.
The reduced wage differentials can of course be
explained by the increased supply of highly edu-
cated labor.

The consequences of reduced returns to schooling
are ambiguous. If highly educated workers in cer-
tain fields of the labor market were receiving
"monopoly rents" during the 1960's, the "educa-
tional explosion" have doubtless had favourable
distributional and allocational effects. If, on the
other hand, the incentives to invest in schooling
have become too small, the situation is more prob-
lematic. Probably a disaggregated analysis of vari-
ous educational groups is needed to find out
whether the consequences have been positive or
negative.

However, some caution is in order before too strong
conclusions about decreased "returns to schooling"
are drawn. It is also important to emphasize that
the selection of students has changed dramatically.
For this reason, workers with a certain amount of
schooling in the 1960s might not be comparable in
terms of innate ability with workers who had ob-
tained the same amount of schooling in the 1980's.
Before taking the potential effects of changed se-
lection into account, no strong conclusion about
the development of the returns to schooling can be

drawn. It is an important task to examine the Swedish data with the new methodological tools developed in modern labor economics.

Male/female wage differentials

Wage differentials have also declined between men and women. As seen in Table 1, the index of male wages compared to female wages was 139 in 1968, 130 in 1974, 122 in 1981 and 121 in 1984. The differentials have fallen in most age groups.

Table 1   Actual wage differentials between men and women 1968, 1974, 1981 and 1984

Index, female = 100

	1968	1974	1981	1984
18-65 years	139	130	122	121
18-20 "	124	141	115	113
21-25 "	123	119	111	104
26-30 "	127	128	115	107
31-35 "	144	125	119	116
36-40 "	131	139	126	120
41-45 "	142	128	126	128
46-50 "	148	135	131	130
51-55 "	149	127	118	118
56-60 "	127	135	124	122
61-65	143	122	122	130

A basic issue about wage differences between sexes is whether women are discriminated against. This is, of course, a very difficult and complex

question and it will not be analyzed in any depth
here.[1]

However, a closer look at the wage differentials
can easily be obtained by noting that women in
general have accumulated less work experience.
Although we have seen that the pay-off of addi-
tional work experience was negative after around 30
years in the late sixties, it seems plausible that
parts of the differentials can be explained by
unequal distribution of work experience between the
sexes. In order to compare the wage differentials
between men and women with equal experience and
schooling, separate wage equations have been
estimated for the two sexes with the same explana-
tory variables as above. The estimated coefficients
have been used to predict the expected wages of men
and women who stay nine years at school until the
age of 16 and work continuously until the age of
65. The resulting wage differentials are displayed
in Figure 5.

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[1] A more detailed description and analysis of the
male/female wage differentials can be found in the
IUI-study Arbete och löner (Employment and Wages)
by Siv Gustafsson and Petra Lantz, published 1985.

Figure 5   Wage differentials between men and women
           with 9 years of schooling and continuous
           work experience from the age of 16.
           Female = 100
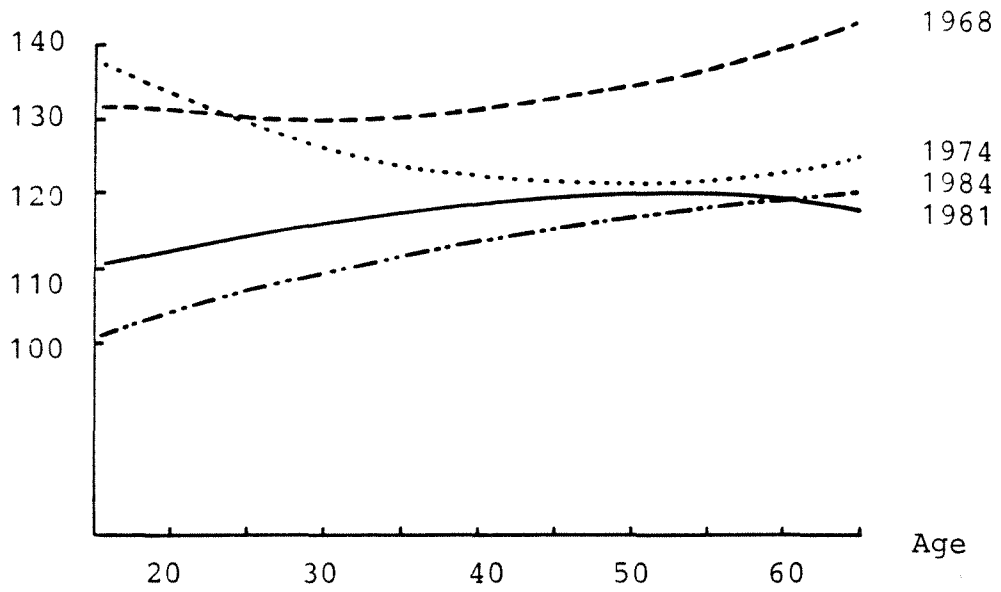
It appears that most of the wage differentials remain even when women and men with equal schooling and work experience are compared. At least three factors can explain these differentials. First, it might be that "work experience" is a poor measure of the total "human capital" obtained via job training. Part-time jobs have been much more common among women. Consequently, the real differences between the sexes are not captured by these variables.[1] Second, it might be that the work conditions differ between the sexes. If, e.g., men have physically more demanding jobs and such jobs are compensated for with higher wages, differentials like those in the figure should appear. Third, it might be that women suffer from some kind of discrimination. By using better data on work experience and work conditions the analysis can be carried further. The HUS-data will give some opportunities to do this.

Although wage differentials persist between equally educated and experienced men and women, the differentials have declined markedly since the late 1960's. Furthermore, in 1984 the wage differential was very small among those below 30. A hopeful interpretation of this finding is that there is almost equality between the sexes in the young generation. It remains to be seen whether this equality will remain during their active careers.

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[1] The work experience variables only measure the number of years with any work experience.

The industrial wage differentials

Wage differentials have also diminished between industries. One way to illustrate this is to use a figure displaying the average wage in industries above and below the average for all industrial workers. Such a figure has been produced by the Workers Trade Union (LO) and it has become famous for its "cone-looking" shape. (See Figure 6.) "Industry" is defined here as the branches of LO.

Figure 6 Dispersion of wages between industries, blue-collar workers
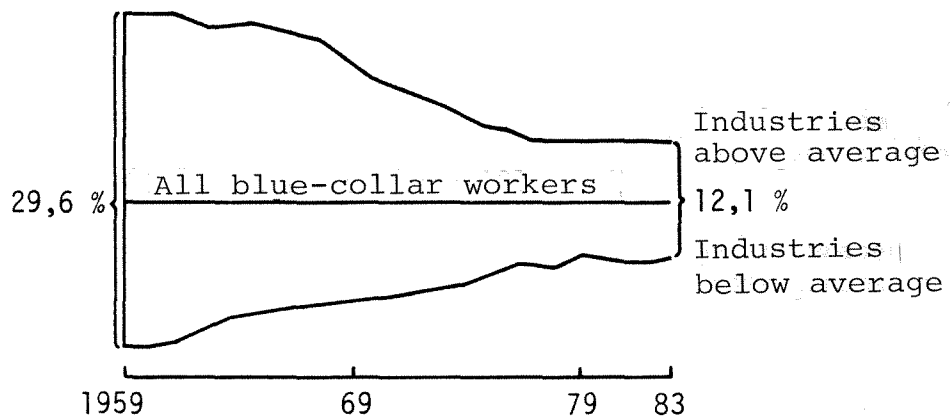
Source: LO.

From the allocational point of view, it is not only the dispersion per se that is crucial. It is also important to know whether the wage structure is sensitive to changing market conditions. A given dispersion of wages - as measured for example by the coefficient of variation or as displayed by Figure 6 - is compatible both with a rigid and a flexible structure of industrial wages.

It is harder to describe the stability of the wage structure. The data in Table 2, which shows the relative wages for blue collar workers in selected industries, do provide some information. The selected industries include some, which have been hit by serious structural problems during the seventies - like mining, basic metal industries and shipbuilding - and others, which have had very favorable demand conditions - like manufacture of motor vehicles and chemicals.

Has the structure been rigid or flexible? This is hard to say from these data and without some "standard" to compare with. Some changes have clearly taken place. A marked decline of the relative wage from 117 in 1972 to 105 in 1984 has occurred in the ship building industry. In other "crisis industries", however, the relative wages have been surprisingly constant. It is also surprising that the motor vehicles industry has had a constant relative wage in spite of very favorable demand conditions and rapid expansion.

**Table 2   Relative wages for blue collar workers
in selected industries**

SNI 2+3 (Mining, quarrying and manufac-
turing) = 100

	1972	1976	1980	1984
Mining and quarrying (SNI 2)	115	119	114	117
Textile, wearing apparel and leather industries (SNI 32)	85	85	88	87
Manufacture of pulp, paper and paper products (SNI 341)	102	109	110	116
Manufacture of chemicals (SNI 35)	95	97	98	100
Manufacture of non-metallic mineral products (SNI 36)	99	98	101	101
Basic metal industries (SNI 37)	107	109	108	109
Manufacture of electrical machinery (SI 383)	96	96	95	96
Ship and boat building (SNI 3841)	117	111	105	105
Manufacture of motor vehicles and parts and accessoires (SNI 3843)	103	101	100	n.a.

Source: Statistics Sweden Wages, ("c-wage").

An international comparative study is needed to
find out whether the Swedish institutional wage
setting process produces extraordinarily rigid wage
structures. Still, it is tempting to argue that the
changes in the wage structure during the last 12

years have produced very small incentives -in terms
of <u>wage gains</u> - to move from the declining indus-
tries (textiles, mining and shipbuilding) to the
expanding ones (manufacture of motor vehicles and
electrical machinery).

This is not to say that there have not existed any
incentives at all to move between the industries.
First, the studies by Bertil Holmlund have shown
that movers in the labor market have received sig-
nificant wage gains.[1] Second, the unemployment
risks have, of course, differed between the indus-
tries. It might be that these so-called "push"
incentives are the most important incentives for
reallocation of labor in the Swedish labor market.
However, the decline of job mobility and rising
long-term unemployment motivates the critical ques-
tion whether the incentives have been strong enough
and of the "correct" nature during the last 20
years.

The HUS-data will provide innovative opportunities
to analyze job mobility. Very detailed data about
the causes and consequences of job changes are col-
lected. In particular, the importance of "push-in-
centives" (unemployment risks) and "pull-incen-
tives" (wage-differentials) can be examined.

To summarize, we have found in this article that
wage dispersion has diminished in Sweden in several
dimensions: between age groups, between experienced
and inexperienced workers; between well-educated
and less educated workers; between men and women;
and between industries. In addition, to this devel-
opment of gross hourly wages, increasing marginal

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[1] <u>Labor Mobility</u>, IUI 1984.

taxes during the 60's and the 70's have reduced post-tax wage differentials even further.

As pointed out above, this development raises a number of important issues. Has the reduction of wage differentials really resulted in more equally distributed life incomes? Have the rising relative wages for teenagers and the elderly been a major cause of the unemployment problems for these groups during the 70's and the 80's. Have the incentives to invest in "human capital" of various sorts been too low?

To what extent has the stable industrial wage structure reduced the incentives to move from the "crisis industries" to the expanding sectors of the economy? To what extent has the overall growth in the economy been retarded because of this?

One of the virtues of the micro data on households collected in the HUS-project is that such issues can be analyzed in a much better way than has previously been possible. In addition, one of the most important advances in modern labor economies has been the invention of econometrical tools to estimate models of labor market behavior from micro data. By combining these methodological tools and the HUS-data, future research efforts at IUI will be able to give more reliable answers on the issues raised in this article.