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WAGE SETTING IN FINLAND**

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ABSTRACT: In this paper wage formation in Finland is analyzed within
the trade union and wage bargaining model framework. The first part of
the paper contains a brief presentation of the development of wages and
the institutional set-up as well as some attempts to identify causal
factors. In the second part a set of new wage equation estimates based
on the trade union approach is provided. According to the results, the
real wage is driven by trend productivity growth and unemployment - in
particular, medium-term unemployment and/or unemployment of union
members - explains the main fluctuations around the trend.

1. Introduction

In the discussion about Finnish economic policy, the development of wage costs has traditionally been considered essential for attaining rapid growth, price stability and external balance. This is because wages relative to those in other countries have been seen as the most important determinant of profitability and investment in the traded-goods sector.

In the postwar period average growth in the Finnish economy has been slightly higher than in the other Nordic countries and in the OECD area as a whole. On the other hand, growth has been more volatile, both because of greater vulnerability to external shocks and because of wage-price dynamics. Inflation has on average been higher than in the competitor countries, which has at times led to severe employment and balance of payments problems. These problems have as a rule been solved through repeated large devaluations. The competitive position of the economy, as measured by relative unit labour costs has varied considerably. Against this background stabilization policies have not been very successful.

This description of events pertains, however, only up to the late 1970s, after which most macroeconomic aggregates have developed more smoothly and more favourably. Real real wage growth has been in line with the growth of labour productivity. Output growth has been above the OECD average. The main problem during this period has been unemployment, which has been at a higher level than earlier, although still much lower than in continental Europe. In recent years external balance has again deteriorated.

The aim of this paper is to look closer at wage formation process during the post-war period of both success and failure. Another aim is to see what can be learned from empirical analyses of wage setting which, in contrast to most of the previous work, recognizes explicitly the presence of labour market organisations and the system of centralized wage bargaining.

We start by a brief presentation of the development of wages and try to identify broad causal factors. The next part of the paper gives a summary of the institutional set-up in the labour market and its relation to macroeconomic performance. The final sections present a review of earlier empirical research on aggregate wage equations in Finland as well as a set of new estimates based on the trade union approach.

2. Wages and some causal factors

Nominal wage developments in Finland have broadly resembled that in the other Nordic countries as well as in the other small European economies (cf. Calmfors, 1984). For instance, the wage explosion in the mid-1970s stands out quite clearly. Worth noting is also the fact that the nominal wage increases in the 1980s have been at roughly the same level as in the 1960s (*Figure 1*). Nominal labour costs to employers have risen somewhat faster than money wages. As will be seen below, the payroll tax rate rose steadily up to the mid-1970s, after which it has remained more or less constant.

Figure 1. Annual change in money wages

Relative unit labour costs (*vis-à-vis* competitor countries) are depicted in *Figure 2.* Decomposing this measure of competitiveness, which displays substantial variation over time, into relative wage costs, the effective exchange rate and relative productivity, it turns out that the latter two components have developed favourably over the past ten years. This helps explain why there has not been great losses of competitiveness despite comparatively large increases in wage costs. The long-run development is characterized by high wage inflation and offsetting devaluations.

Figure 2. Relative unit labour costs

The development of real consumption wages, both pre- and post-tax, for the private sector is shown in *Figure 3*. It is seen that the average increase in real pay has been lower since the mid-70s than before. Real wage increases peaked in 1969-1971, not in 1974-75 as in

other Nordic countries. It is also seen that post-tax
real wages show greater year-to-year variability than
pre-tax wages.

> *Figure 3.*   Real consumption wages in the private
> sector: before and after tax

For comparison, the growth of public sector real
wages is depicted in *Figure 4*. Although the profile looks
rather similar, there are some notable differences. First,
the year-to-year variability seems to be somewhat greater.
Secondly, the large real wage increases gained by the
private sector employees in the first half of the 1970s
did not concern the public sector.

> *Figure 4.*   Real wage growth in the public sector

The real wage relevant to the employers is the
real product wage, *i.e.* nominal wage costs divided by
producer prices or by the value-added deflator. Changes
in producer and consumer prices may differ because of
changes in relative prices. In Finland, producer prices
have, however, moved roughly in line with consumer prices,
at least when the value-added deflator for the total
private sector is used as comparison. Relative import
prices have shown larger fluctuations dominated by the oil
price changes.

The other factors that drive a wedge between
the real product wages paid by the employers and the real
after-tax consumption wages earned by employees, are the
payroll and income taxes. The standard measure for the
combined wedge is

(1)
$$q = (w(1+t_e)/p)/(w(1-t_w)/p_c)$$
$$= (p_c/p)((1+t_e)/(1-t_w)),$$

where w is the wage rate, t_e and t_w stand for the payroll tax rate and the average income tax rate, respectively. The output price index is denoted by p and the consumer price index by p_c.

The combined wedge is depicted in *Figure 6*. It shows a rising trend from the mid-60s up to 1974, after which it declined rapidly and then remained constant in the 80s. Thus, the wedge was largest at the time when money wage growth was highest and the real wage growth exceeded productivity growth by a large margin. The tax components of the wedge rose steadily up to the mid-70s, after which they stabilized and even declined in some years (*Figure 6*). The movements of the average income tax rate have been accompanied by changes in the marginal rate of taxation. The fall in income tax rates in 1976 and a few subsequent years reflects the shift from joint to separate taxation of spouses as well as the adjustment of tax scales to inflation, which has been applied since that year.

Figure 5.   The wedge
Figure 6.   Rates of taxation

There is a long tradition of emphasizing demand conditions in the labour market as a main determinant of wage movements. Unemployment is regarded as an indicator of demand pressures. In the recent literature on the trade union and bargaining models, the rate of unemployment plays an important role because it is considered to affect the costs of wage increases as perceived by the trade unions in wage negotiations.

As is borne out by *Figure 7*, unemployment rose considerably in 1977-78. The immediate reason was the restrictive demand policies adopted at that time. However, despite the recovery in 1979-80, unemployment has stayed at a high level, at least in comparison to Sweden and Norway. The average rate in the 80s has been around twice

as high as in the early 70s. The increase in unemployment reflects mainly an increase duration (Eriksson, 1985). Another characteristic of the development is the uniformity of unemployment rises across age and occupational groups as well as across geographical regions. The only significant changes in the composition of unemployment are the narrowing differentials of the unemployment rates between males and females and the divergence of the rates between union members and non-members (see below).

Figure 7.   Unemployment

3.   Institutional setting of the labour market

3.1. *High unionisation*

Presently, more than 80 per cent of all wage earners are trade union members (*Figure 8*). This is one of the highest shares in industrialized countries. The high union density is not, however, a long-established phenomenon. It did not exceed 50 per cent until the late 60s, after which it grew rapidly. In the 40s and 50s, union density fluctuated around 30 per cent - roughly at the same level as in continental Europe, but substantially lower than in the other Nordic countries. Before World War II, it was typically around 10 per cent.

Figure 8.   Union density

Historically the degree of unionisation in Finland has been higher among salaried employees than among blue-collar workers. This continues to be the case. The difference has, however, narrowed in the seventies. In earlier days, the white-collar unions, however, played a less important role in wage negotiations than they do today. More recently, they have adopted the same manners as the blue-collar unions have traditionally done.

Trade unions are typically organized nationwide by industry. Industry unions, in turn, are members of central confederations. The largest of them is *The Central Organisation of Finnish Trade Unions* (SAK), which now organizes about 60 per cent of unionized employees. The bulk of SAK member unions represent manufacturing workers, although the proportion of white-collar and non-manufacturing unions has increased.

The other three central federations are, in order of size, *The Confederation of Salaried Employees in Finland* (TVK), *The Confederation of Unions for Academic*

Professionals in Finland (AKAVA) and *The Confederation of the Technical Employee Organisations in Finland* (STTK). TVK and STTK are salaried workers' organisations and the membership of AKAVA mainly consists of employees with a university degree. In 1985, the shares of TVK, AKAVA and STTK of all unionized employees were 21, 12 and 7 per cent, respectively. The shares of AKAVA and STTK have been increasing since 1970, reflecting changes in the occupational structure of the labour force. As a consequence, the previously dominating role of SAK in wage negotiations is gradually weakening.

The extent of organisation among employers is high as well. Over 60 per cent of private sector employees work in firms which are members of the two largest employers' confederations: *The Finnish Employers' Confederation* (STK), and *The Employers' Confederation of Service Industries* (LTK).

2.2. *Emergence of centralized bargaining*

Prior to World War II, there were no nationwide wage agreements in Finland, only local or regional wage contracts. First in 1940 did the employers' confederation officially recognize the labour unions' federation as an equal negotiating partner. As a result, national wage bargains were struck in several industries.

The ten-year period following the war was characterised by strict regulations of wages and prices. However, labour market organisations were represented on the board administering the price and wage controls, and could therefore exercise a certain influence on the contents of these policies. The representative of the government in the price and wage controls board did also participate in the wage bargaining process. On some occasions, the government actively contributed to the reaching of wage agreements through commitments to certain policy measures. It was also typical that agreements

included index clauses and the government used subsidies
in order to keep prices under the critical index points.
For instance, in 1951 the government committed itself to
large food subsidies in exchange for low nominal wage
increases. Another example was the introduction of the
child allowance system in connection with a national wage
agreement. Hence, almost from the very beginning labour
market organisations became used to having the government
as a third, potentially active, partner in wage
negotiations.

The abolition of wage and price regulations at
the end of 1955 changed markedly the scene for wage policy.
Housing rents and food prices went up sharply, and attempts
to restore real wages resulted in a general strike. Shortly
after the strike, the SAK was split into two rival
fractions. The economy went into a deep recession;
unemployment increased sharply and for almost three years
real GDP hardly grew at all. During these three years no
centralized agreements were reached.

In the beginning of the 1960s, the number of
industries covered by centrally negotiated wage agreements
rose and the contract length was extended to two (1961-62
and 1964-65) and three years (1966-68). A special feature
of this period was the inclusion of several non-wage
issues, such as pensions, working time reductions and
equality of pay between sexes to the negotiation agenda.

In 1967, the Finnish Markka was devalued by 28
per cent. As the three-year contract which was in force
to the end of 1968 included full compensation for price
increases, the effects of the devaluation on the price
level would have been automatically transmitted into
wages. In order to prevent this taking place, the
government initiated new negotiations, which led to
moderate money wage increases and to the abolition of
indexation. The government in turn committed itself to
pursue strict price and rent controls. The abolition of

indexation was made permanent by law and, in addition to wages, it was extended also to bank loans and deposits.

The 1968 contract marked the beginning of the era of comprehensive incomes policy packages. The comprehensive agreement in 1968 was helped by the fact that the two rival organisations for the blue-collar workers had been united in 1967, and probably also by the fact that the social democrats and the communists were both in the government. The main objectives of the package, lower inflation and higher growth, were successfully accomplished, and a similar agreement was reached also in 1969. The tripartiate negotiations were continued throughout the 1970s and still constitutes the framework for the centralised wage bargaining.

Table 1. Centralized wage agreements
for manufacturing workers

2.3. *Recent centralized agreements*

The length and timing of wage agreements has varied considerably (*Table 1*). During the past 15 years, the agreements have generally come into effect in March or April. The length of the contracts has usually been two years, although in times of accelerating inflation or rising uncertainty about future price development, one year contracts have been the rule. In the 1980s partial indexation reappeared in the agreements. In these cases, compensation has been promised for the rate of inflation higher than a preannounced threshold corresponding to expected inflation. In the early 1980s, the threshold was adjusted for terms-of-trade changes.

An important aspect of the central negotiations between confederations of trade unions and confederations of employers' associations is that the agreements act only as a common and generally accepted guideline for the subsequent more specific agreements negotiated between

individual industry unions and employer associations. The
results of the union level agreements then set guidelines
for individual firms. Even though negotiations have, since
1968, always occured between central organisations, it may
happen that no agreement is reached at that level. Then
industrywide organizations have to work out their own
agreements without any central guidelines. During the
past 20 years this has happened four times, three of them
in the 1980s. Union level contracts have always been of
one-year length.

Until recently, negotiations for a new contract
have typically started between the representatives of SAK
and STK. If these negotiations fail, they have continued
between memeber unions and the corresponding employers'
organisations. Due to the growing importance of the public-
sector unions and the increasing share of unionized white-
collar groups, the conventional bargaining set-up has
come under pressure.

During the past fifteen years, it has become more
or less a rule that one or two member unions remain are
not encompassed by the general centralized agreement.
This can be explained by attempts to get wage increases
in excess of the centrally agreed guideline. The
credibility of centralized agreements has therefore been
undermined. This is one reason for the recent debate on
the merits of moving towards more decentralized bargaining.

Over the years, the character of centralized
agreements has varied considerably. The agreements for
1969 and 1970 clearly aimed at stabilisation objectives,
whereas the later agreements have been qualitatively
different. In particular, the experience of the early
1970s, when inflation was running out of control, had
long-lasting consequences on wage formation. The high
wage drift in manufacturing upset the established wage
structure and fueled compensation demands on part of
the non-manufacturing unions for many years to come. The

burden of taxation, both average and marginal, rose rapidly with inflation. This made unions increasingly concerned with real after-tax wages. As a consequence, a number of other issues than wages were again added to the negotiation agenda, and it became a commonplace to link government commitments on tax and social policies to wage agreements.

Figure 9. Negotiated wage increases
and wage drift

In the first comprehensive incomes policy agreements the general wage increase was stated in absolute terms - the so called penni-line. This resulted in a compression of wage differentials between industries and, above all, between blue- and white-collar workers. As of 1978, the penni-line has been mostly abandoned, except for the SAK-STK agreements.

The unexpected changes in relative wages in the early 1970s led to increasing wage-wage linkages. The public sector employees and some other white-collar groups started to demand so-called earnings development guarantees, which between 1974 and 1981 were formally included in most contracts for the groups concerned. These clauses guaranteed automatic wage increases to compensate for any unexpected wage drift enjoyed by manufacturing workers. While earnings gurantees in conjunction with the move towards general wage increases defined in terms of a percentage increase have implied a tendency towards preservation of existing wage differentials, they at the same time have enhanced the centralized nature of the wage negotiation system.

2.4.   *Unemployment insurance*

The key assumption of the trade union models is that unions are interested not only in the real wage but in the employment outcome as well. A standard prediction from these models is, therefore, that unions will be more inclined to push for higher wages the higher real

unemployment benefits are; higher benefits make the negative consequences of job losses less severe. It is also frequently hypothetized that lower employees' contributions to the financing of unemployment compensation schemes or labour market programmes for the unemployed tend to raise the target wage [1].

The level of real unemployment benefits rose up to 1972, after which it has steadily fallen (*Figure 10*). The replacement ratio for the average worker has exceeded 70 per cent in only two years, although it should be noted that up to 1986 unemployment insurance benefits were untaxed income. Yet, it would appear that the cost of wage increase in terms of job losses has increased rather than decreased since the mid-1970s.

The level of real unemployment benefits rose up to 1972, after which it has steadily fallen (*Figure 10*). The replacement ratio (the ratio between the unemployment benefit and wage income) for the average worker has exceeded 70 per cent in only two years, although it should be noted that up to 1986 unemployment insurance benefits were untaxed income. Yet, it would appear that the cost of becoming unemployed has increased rather than decreased since the mid-70s.

Figure 10. Unemployment insurance: replacemant ratio and real benefit index

Such a conclusion must, however, be qualified in at least two respects. First, the fraction of wage earners covered by the unemployment insurance funds system - which is virtually identical to the fraction of unionised labour - has risen significantly during the 1970s. Secondly, in addition to the unemployment insurance, there is also an unemployment compensation system for non-members, so-called unemployment assistance. This system has expanded since 1972, when entitlement to benefits under this scheme was extended to labour market entrants. Receipt of unemployment assistance is means

tested and the benefits are lower than those provided by
the unemployment insurance system. There is no maximum
entitlement period for unemployment assistance benefits
whereas an unemployment insurance fund member is entitled
to benefits for a maximum of 200 days per year, and a
maximum of 500 days during three subsequent years. As in
the case of unemployment insurance, the real value of
unemployment-assistance benefits has been falling since
the mid-1970s.[2)]

These observations imply that the group of
non-members has decreased proportionally and that the
non-members' income losses due to unemployment have become
smaller as from the beginning of the 1970s. The extension
of unemployment benefits to non-members is, however,
likely to have had other effects as well. In particular,
there is some evidence suggesting that this scheme may
have increased the measured unemployment rate at any
given level of aggregate demand, because earlier hidden
unemployment now became open (Santamäki, 1980; Eriksson,
1985; and Ingberg and Lahdenperä, 1986).

The unemployment rate among the members of the
unemployment-insurance funds, which prior to 1972 exceeded
the rate among non-members, has since then been lower
(*Figure 11*). The spectacular divergence of these two
unemployment rates, in particular in 1976-78, probably
reflects that the increase in total unemployment fell on
the labour market entrants and to some extent also that
the number of recipients of unemployment-insurance benefits
who exhausted their benefits entitlement rose sharply
during this period.

Figure 11.   Unemployment among insured
             and non-insured workers

4. Wage formation and macroeconomic policy

4.1. *Fiscal policy*

The centralized labour market organisations naturally
have both an interest and a potential power to exercise
some influence on the economic policy of the government.
Similarly, the labour market organisations no doubt
recognize the constraints faced by the economy, although
there may occasionally be some disagreement on the severity
of these constraints.

We have already referred to some episodes, when
the government has introduced certain fiscal measures in
order to moderate wage inflation. These include "purchases
of index points" in the pre-1968 era of wage indexation,
and certain reforms with respect to social policies,
such as the introduction of the child allowance system in
the early 1950s and the compulsory insurance scheme for
employment-related pensions in the 1960s.

Since the upsurge of inflation in the early 1970s
the government's tax decisions have played an increasingly
important part in the wage formation process. This was,
in part, due to rapidly rising rates of taxation (*Figure
6*). With high money wage increases and unindexed tax-
schedules, the progressivity of taxation started to affect
also the medium-income groups, i.e., the median members
of the unions, who became increasingly concerned with
real after-tax wages.

Since 1976, the tax scales have been adjusted
yearly, although the adjustments have not formally been

tied to actual inflation. This has provided the government with an opportunity to offer tax reductions in exchange for moderate wage agreements. In some cases tax reductions have been promised as a part of the incomes policy package, in other cases the government has set the tax scales before the negotiations have started or it has punished the labour market organisations for inflationary agreements *ex post* (*Table 2*).

Table 2. Tax scale adjustment
and inflation

Fiscal policy in Finland has never been especially ambitious in terms of the Keynesian objectives of stable output and employment. Rather the policy has relied on the fiscal orthodoxy of maintaining a balanced budget, which frequently has made fiscal policy work in a procyclical direction (Pekkarinen *et.al.*, 1984). This tradition was given up in the latter half of the 1970s, when the country suffered from the most serious post-war recession. Fiscal policy turned expansive in 1977, but even then it could hardly be characterized as a Keynesian aggregate demand policy. Rather, it relied on a supply-side strategy of strengthening corporate profits in order to stimulate investment and exports. Consequently, tax reliefs were directed to the corporate sector, which were helped also by two defensive devaluations in 1977 and 1978.

The 1977 marked a break to the earlier policy orientation in many respects. Fiscal activism became accepted, although with a supply-side flavour and in a medium-term context. The new strategy seems to have brought about remarkable results in terms of output and employment growth. Fiscal activism was exercised in the early 1980s, when tax reductions again were used as a counter-cyclical weapon. The period from 1977 to the mid-1980s is frequently characterized as a period of consensus during which the unions gained steady increases in real wages and stable employment.

4.2. *The exchange rate regime*

Until 1973, Finland was part of the Bretton Woods system
with a fixed exchange rate. Since then, the Markka has been
fixed against the trade-weighted basket of currencies,
except for a short period in the early 1970s. Recent
deregulation of the financial markets has made the monetary
authorities more dependent on the exchange rate policy
choice. The proximate target of monetary policy is stable
effective exhange rate defined in terms of the currency
index, which, however, is allowed to fluctuate within
certain preannounced limits. This freedom has been used
increasingly during the past two years, the aim being to
create a certain amount of exchange rate uncertainty in
order to discourage short-term speculative capital
movements. The regime remains, however, that of the fixed
exchange rate.

The fixed exchange rate regime should, in theory,
link domestic inlation to that in the rest of the world
and leave only a very limited role to monetary policy.
There are at least two reasons for why this may not have
been the case. First, except the last few years the
control of capital movements and the tightly regulated
domestic financial system provided the Bank of Finland
with considerable monetary autonomy. Secondly, the effects
of the international business cycle on domestic output
and inflation have often been amplified by the one-sided
structure of Finnish exports. The large share of forest
industry products in total exports explains, in part, the
earlier instability of the economy, because world trade
in these products typically experience larger volume and
price changes than trade in other industrial products. In
addition, price and volume changes are typically
correlated, thus amplifying their effect on domestic
macroeconomic stability.

The large devaluations in 1957 and 1967 (28.1 and
23.8 per cent, respectively), had long-standing effects at
least on expectations. Although both were done in

a situation of deteriorating competitiveness they were
offensive by nature. In neither case was the size of the
exchange rate adjustment justifiable by purchasing-power-
parity considerations alone (Suvanto, 1977). The 1957
devaluation aimed at helping the previously protected
manufacturing industries to enter the free trading system.
The 1967 devaluation, in turn, aimed at encouraging
structural change and diversification of exports. Both
devaluations have been argued to have distorted the
distribution of income and fueled future inflation and
hence laid down a seed for a new devaluation (for a
discussion on the ten-year devaluation cycle, see Korkman
1980).

Unlike in 1957 and 1967, the series of
devaluations in 1977 and 1978 were defensive by nature,
roughly in line with what could be justified by purchasing-
power-parity considerations. Nevertheless, the size of
the three devaluations in those years amounted to 17.6 per
cent in effective terms and probably reinforced the earlier
belief that devaluation is a practical solution to
problems of competitiveness created by earlier excesses
in wage increases.

Having the experience of these large devaluations,
one could assume that exchange rate accommodation is
built into expectations. There is ample anecdotal evidence
that this has, indeed, been the case, but the conclusion
should be qualified in a number of respects. As mentioned
above, the 1957 and 1967 devaluations were special cases
in that they had other objectives in addition to the
restoration of the competitive position. Furthermore,
the 1967 devaluation was accompanied by a series of other
measures, including the comprehensive income policy
package (see above), one element of which was the
cancellation of the index adjustment of wages previously
agreed upon. A similar experiment with so-called nominal
adjustment was made in conjunction with the defensive
devaluation in 1977 when the general wage increase that
had already been negotiated was postponed.

The events since 1978 witness important changes
in the attitudes of both the authorities and the public to
exchange rate adjustments, although these changes have
been gradual. First, the currency was allowed to appreciate
and even was formally revalued in 1979 and 1980. Since
then capital movements have started to play an increasingly
important role. In September 1982 there was a speculative
attack against the currency, to which the authorities
reacted, perhaps unfortunately, by letting the currency
depreciate. This episode was followed by the large
devaluation of the Swedish krona, to which the Finnish
government reacted by a formal devaluation of Markka. In
1986 the currency became again under pressure, but this
time the Bank of Finland decided to fight the market
sentiment in order to gain credibility in its commitment
to the new "hard currency line".

4.3. *Evaluation*

Inflationary shocks, which typically have originated from
abroad, seem to lead to wage-price spirals, which hurt
competitiveness with a delay, usually at the time when
exports are hurt also by weaker demand and prices. At
this stage the wage-wage linkages step in and make
adjustment more sluggish, because the unions representing
the non-traded goods sectors demand compensation for wage
drift enjoyed by traded-goods sector unions. The loss in
competitiveness brings about a worsening external balance
and policy tightening. The resulting rise in unemployment
is required before wage moderation begins to have an
effect. Hence, even if wage increases have to a large
extent been accommodated by fiscal and/or exchange rate
policies, the accommodation has not been automatic and
not immediate.

The above observations about the policy environment in
Finland do not warrant any firm conclusions on systematic
fiscal or monetary accommodation of wage increases. Some
major changes, however, seem to have occured in connection

with periods of perceived crises and rising unemployment.
The year 1967 is one example of such an episode; it marked
the beginning of the era of comprehensive incomes policy.
The traumatic experience of the mid-1970s brought about the
reorientation of fiscal policy towards increased activism.
On both occasions, the labour market organisations showed
remarkable flexibility, suggesting that they do recognize
the negative employment consequences of excessive money
wage increases.

The later changes, including the changes in
financial environment and the consequent reassessment of
the roles of monetary and exchange rate policies have
been more gradual. It is too early to assess the
implications of these changes, but one could conjencture
that the "hard currency stance" of the Bank of Finland
has gained increasing credibility, while more and more
claims and expectations are directed to fiscal policy,
not least in the area of employment guarantees. One
possibility is that wage increases will increasingly be
accommodated by fiscal measures and, perhaps, by public
sector job creation.

5.   Earlier research on aggregate wage equations

Most of the research on Finnish wage formation has been
of two types. Either it has been carried out within the
framework of macroeconometric models, set up mainly for
forecasting purposes, or it has been the question of
single-equation Phillips-curve models (for a recent review;
see Blomqvist, 1986). In the former studies, the common
practice has been to set up a nominal wage equation with
prices, unemployment and labour productivity as explanatory
variables (e.g. Vartia, 1974). In the latter, expected
(or actual) inflation has usually been added to
unemployment as an explanatory variable.

Although the wage equations have not been
explicitly derived from any formal theory of labour market
behaviour, the wage-price bloc estimations, as well as
the Phillips-curve equations have generally been
interpreted as parsimonous reduced-form representations
of a complex, and not wholly understood, system in which
centralised wage bargains and market forces interact. For
instance, in some Phillips-curve estimations the rate of
unemployment is sometimes interpreted not only as a measure
of excess demand but also as an indicator of the unions'
bargaining strength.

Other explanatory variables that have been added
to the Phillips curve equations have ususally been
motivated by attempts to make the estimated equations more
realistic. Examples of such intruders, which have been
thought of as important in capturing the bargaining
strength or the militancy of trade unions, are profits and
union density.

Hence, it is not the case that institutional features of the wage bargaining system have been totally neglected in earlier work, although they have not been accounted for in the formal derivation of the wage models. Rather they have been artifically plugged into models which do not explicitly recognize wage bargaining.

The analytical framework which has aimed perhaps most at taking some of the characteristics of economies with centralized wage setting into account is the so-called Scandinavian model of inflation. This model is, however, probably to be interpreted more as a normative theory for economic policy rather than as an analytical model of economic behaviour (Lindbeck, 1979). It is therefore not evident what can be learned from statistical tests of it. The Scandinavian model is basically a long-run model and is usually supplemented with some Phillips-curve relationship to capture the short-run dynamics of wages.

Earlier research on Finnish wage formation has focused on *two* topics. The *first* is whether there was a fundamental change in the wage formation process as from 1968, the year of the abolition of wage indexation and the beginning of the comprehensive incomes policy packages. Paunio and Suvanto (1981) estimated an expectations-augmented Phillips curve using "observable" inflationary expectations, which had been derived from observed differences in yields between indexed and non-indexed bonds. This special feature enabled them to distinguish between catch-up effects and the effects of expected inflation to wage increases. According to their results, a Phillips-type relationship between nominal wage changes and unemployment did not exist prior to 1968, but since then the rate of unemployment consistently appeared as significant variable in the wage equation. The authors argued that during the period of indexation prior 1968 the catch-up hypothesis was best designed to explain wage formation, whereas an expectations-augmented Phillips

curve traced changes in nominal wages better during
1968-74.

Also Halttunen (1974), who estimated sectoral
Phillips curves, found that there was a change in the
wage formation process as of 1968, which he attributed
to the beginning of the era of the comprehensive incomes
policies. He did not, however, explain why the Phillips
curve had shifted outwards as a consequence of the
introduction of incomes policy. Some doubts about the
structural break in 1968 were raised by Pekkarinen *et al.*
(1978), whose regressions based on moving estimation
periods showed that the changes were gradual and that the
parameter estimates in general were rather unstable.
Virén (1980) carried out a similar analysis and found
that not only were the parameters of Phillips curve models
notoriously unstable, but also that their post-sample
prediction power was poor.

The *second* issue, which has received much
attention, concerns the effects of devaluations on sectoral
wage differentials and thereby also on aggregate wage
formation, since attempts in other sectors to compensate
for wage drift in the traded goods sector may give rise
to a wage-wage spiral. This type of research was driven
by the observation of notably large changes in the wage
dispersion over the business cycle (Pekkarinen et al.,1978;
and Harjunen and Leppänen, 1984) and, in particular, of
the wage dispersion immediately following the large
devaluations. However, no decisive evidence of the export
sector acting as a wage leader has been found.

This finding is somewhat disturbing for the so-
called Scandinavian model of inflation, the key assumption
of which is that the tradeables sector acts as a wage
leader. Empirical analyses on Finnish data within the
Scandinavian model framework (Molander, Aintila and
Salomaa, 1970; Korkman, 1980; and Blomqvist, 1981) have
included the unemployment rate in the wage equation and
this has proven to be of some importance. As noted by

e.g. Blomqvist (1986), such findings may be interpreted in different ways. Unemployment may be thought of as an excess demand indicator which influences wage drift, whereas the proper Scandinavian-model variables capture the main determinants of negotiated wage increases. But it may also capture the short-run dynamics, while the other variables trace out the long-run factors or act as a proxy for the bargaining strength of the parties in the wage negotiations.

The only Finnish study purporting to test the Scandinavian model against alternative models is Blomqvist (1981). It ends up with rather mixed results, which show that prior to 1968 the Scandinavian model fits facts poorly. For the traded goods sector an expectations-augmented Phillips-curve outperforms the Scandinavian model, while the latter tracked the data quite well for the non-traded goods sector.

A frequently offered explanation for the instability of Phillips curve estimates is that the unemployment rate is a feeble indicator of excess demand in the labour market. A related explanation is that the instability is due to an increase in the natural rate of unemployment (NAIRU). Despite numerous claims that the NAIRU in Finland has risen during the seventies, investigations of this hypothesis has not been carried out within the Phillips curve framework. Rather they have been based on unemployment accounting exercises or regression equations with the unemployment rate as the dependent variable.

The search for potential causal factors behind the suggested increase in the natural rate in Finland has only been crowned with limited success. Changes in the composition of the labour force and changes in structural or mismatch unemployment do not seem to have contributed much to the rise in unemployment (Eriksson, 1985). Apart from a major change in the unemployment compensation system in the beginning of the 1970s, unemployment

insurance benefits cannot have caused the secular increase in unemployment, as the replacement ratios have been falling since the mid-1970s (*Figure 10*).

The instability of the empirical Phillips-curve relationship can, of course, be due to omitted variables. Two studies, Ingberg (1984) and Asplund (1986), have extended conventional wage equations to include tax rates. Ingberg derived an equilibrium wage equation from a system of labour demand and supply functions. In the empirical implementation of the model, an excess demand variable was included in addition to the price and tax variables. Of the latter, payroll and average income tax rates proved to be of some importance in explaining wage inflation. The theoretical restrictions on the parameters of the model passed most tests and the only trouble was the instability of some coefficients across estimation periods. Asplund estimated Phillips-curve equations with the average income tax rate, the tax elasticity (the percentage change in tax revenue from a change in pre-tax income) as a measure of tax progressivity, and employers' contributions to social security schemes (as a percentage of total wages and salaries) as additional explanatory variables. According to the results, the response of nominal wages to changes in the average income tax rate and in the employers' social security contributions was close to zero, whereas changes in tax progressivity did have a significant, though small, influence on nominal wage increases.

As is plain from our short discussion, as well as from the two recent surveys (Willman, 1983; and Blomqvist, 1986), there does not exist much agreement about the central determinants of wages in Finland. The observed empirical regularities have been explained in very different ways, and the same explanatory variables have been given differing interpretations. This somewhat gloomy picture suggests that it may be worthwhile to investigate the explanatory power of models of union

behaviour and wage bargaining. The subsequent sections
report the results of such an exercise.

There are two previous studies of wage formation
in Finland within the trade union/wage bargaining
framework. Both are of very recent date and have been
carried out independently of the work reported below.
Tyrväinen's (1988) analysis is based on a bargaining
approach. His equations are estimated on data for the
private sector and the manufacturing industry for the
years 1965-84. His study differs from ours in a number of
respects. The most important differences are that he (i)
uses quarterly data, (ii) makes use of cointegration
techniques in estimating the models, (iii) does not use
labour market variables, but includes gross output
variables in their place, and (iv) does not include
variables representing outside opportunities.

The second study by Pehkonen (1988) also makes
use of quarterly data but differs from Tyrväinen's study
to the extent that the timing of negotiated wage increases
is not explicitly taken into account in the construction
of the time-series model. Another difference is that his
wage data covers the whole economy, although the
differences in wage setting behaviour between traded and
non-traded goods sectors are recognized in setting up the
model. A third distinguishing feature of Pehkonen's study
is that he sets out to estimate a model containing a wage
equation as well as an employment equation. It turns out,
however, that some of the cross-equation restrictions -
notably capital stock neutrality with respect to
unemployment - are not data-admissible, and so he
utilizes single-equation methods instead.

In spite of these and some other differences,
there are also enough similarities in the two studies to
make them the natural references for comparisons with our
results.

6.   **Some new wage equations**

6.1.   *The trade union/wage bargaining approach*

A popular view of labour market organisations, and of
trade unions in particular, is that they are primarily
political organisations and aim at obtaining as high
wage increases as possible, the actual outcome depending
on the strength of the employers' resistance. In order to
maintain macroeconomic balance the government somehow has
to convince the leaders of the labour market organisations
of the need for low nominal wage increases. By and large,
this was how labour market organisations were conceived of
in earlier economic theory and still are in much of the
popular debate.

The revival of the economic analysis of trade
unions has, however, questioned this simplistic view. If,
as assumed in the recent literature, unions are concerned
with the economic interests of their members, they must
be interested not only in the real wage but in the
employment outcome as well.

Although there are several ways in which the
union leaders may weigh the gains of wage increases to
the employed members against the losses arising from
employment reductions, they cannot escape this trade-off.
The lower the perceived cost of wage increases in terms
of lower employment, the more likely are unions to choose
higher wages in exchange for lower employment. Thus, one
of the factors influencing the union's target wage is the
elasticity of labour demand with respect to the real labour
cost.

How then do models of collective bargaining differ from other approaches, such as the Phillips-curve models? Bargaining models start off from the assumption that the labour market organisations pursue real objectives, that is, they compare the costs and the revenues of wage increases. It follows that the variable to be explained is the level of the real wage, not the rate of change in the nominal wage as in the traditional Phillips-curve models.

Many empirically estimated Phillips-curve models have the property that an increase in inflation gives rise to a less than proportional increase of nominal wage rises, implying a decline in the real wage. Such a nominal rigidity can be rationalised either by the existence of overlapping contracts or by adaptive or some other form of slowly adjusting expectations. Neither motivation appears entirely convincing in the context of centralised and synchronised wage bargaining as in Finland. The assumption that wage setting is based on naive or uninformed expectations of future price inflation appears implausible in view of the great effort devoted to forecasting the macroeconomic performance during the contract period by the bargaining parties.

6.2.   *The econometric model*

In the following we sketch a simple bargaining model to be used as a guide to the specification of empirical wage equations.

It is assumed that wages are determined in negotiations between trade unions and employers. After the wage has been agreed upon, firms unilaterally set employment. The set-up is an example of the so-called

right-to-manage bargaining model. As in other studies of this type, beginning with Nickell and Andrews (1983), we assume that the wage is determined by the assymetric Nash-bargaining solution, which is obtained by maximizing the product of the parties' utility increments relative to the disagreement outcome.

In order to derive the wage function we have to define the objective functions of the bargaining parties as well as their fall-back utilities, i.e., the utilities in case of a disagreement. Beginning with the employers, let the production function be

(2) $Y = f(K, hN, R; x)$,

where K is the capital stock, N the number of employees, the average working time, R raw materialinputs, and x is an index of technical progress. The real profits (in terms of consumer prices), Π, of firms are

(3) $\Pi = [pY - (1+t_e)whN]/p_c$

where p is the output (value added) price, w the nominal wage rate, t_e the payroll tax rate, and p_c is the consumer price index. The fall-back utility depends on the reduction of production associated with an industrial conflict. In case of a full strike it is determined mainly by the cost of capital and other fixed costs.

On the employee side we assume a utilitarian union, which is concerned with a pool L of workers. Of these N will be employed in the sector covered by the union. They will receive the nominal wage w and pay income taxes at an average tax rate t_w. The corresponding utility is $U(w(1-t_w)/p_c, h)$. Of the remaining L-N workers a proportion λ are unemployed receiving unemployment

benefits b, and a proportion $(1-\lambda)$ are employed outside
the sector and they receive the wage w_0 and work h_0 hours.
Hence we have the union utility function

(4) $V = NU(w(1-t_w)/p_c, h) + \lambda(L-N)U(b/p_c)$
         $+ (1-\lambda)(L-N)U(w_o(1-t^w)/p_c, h_0),$

where U denotes utility when unemployed.

Note that we do not need to make the frequently
made assumption that L equals the membership of the union.
It may well stand for the whole labour force in the sector.
In this case the union would take some social responsibi-
lity for all these workers.

It may also be the case that the union assigns a
lower weight in its utility function to those who loose
their jobs than to those who remain employed. The reason
may be that the probability of being laid off is not
random, but decreases with seniority. If the union acts
in the interest of the median worker, and his lay-off
probability is close to zero, unemployment as well as
unemployment benefits will disappear from the objective
function. Although a majority of workers are in jobs
which they have held for a long time, the assumption
that the median worker is completely sheltered from
variations in employment, however, seems rather strong in
view of the large redundancies in connection with plant
closures at high levels of unemployment.

A third type of union objective function is
obtained by assuming that the union is not only concerned
about its own members' real wages but also about the
wage relative to other groups. In this case the wage w_r
of some reference group should enter the utility function.

The fall-back utility of the union in the case of an industrial conflict is likely to depend on the level of strike fund benefits and related factors. Another factor which is considered to be important in the bargaining context is the relative bargaining strength of the two parties. The latter, is frequently assumed to correlate positively with the union density (the proportion of unionized workers).

The assumption of an asymmetrical Nash bargaining solution will, together with the right-to-manage assumption that employers choose employment so as to maximize their profits subject to the equations (2) and (4), result in a wage equation of the following general form:

(5)
$$w(1-t_w)/p_c = (b/p_c,\ w_r/p_c;\ t_w,\ t_e,\ u,\ h;\ K,\ x;\ \Pi^*,\ V^*)$$
$$\quad +\qquad\quad +\qquad\ +\quad -\quad -\quad ?\quad -\quad -$$

where u stands for the level of unemployment, and Π^* and V^* are the fall-back utilities for the employers and the union, respectively. The signs indicate likely directions of effects.

The wage outcome depends on the variables influencing labour demand, the net gain to the union and its bargaining strength. The Nash bargaining solution does not lead to many unambigious predicitons. In particular, the predicitons concerning variables common to both the union's and the employers' objective functions are ambigious.

We have estimated a number of log-linear versions of equation (5). The simplifications made, as well as the motivations for the explanatory variables will be described in connection with the presentation of the results.

The estimations are done with annual data covering the period 1960 to 1985. This is a rather short period the length of which is dictated by the availability of data. Even if it were possible to construct consistent time-series going back to the 50s, this would not increase the degrees of freedom much, because in that case one should account for various institutional changes and events such as the general strike in 1956. Quarterly data would be no straightforward solution either, since both contract length and the timing of the negotiations have varied, and this would make the dynamic specification of the equations rather complicated.[3] The wage equations are estimated for the private sector only.

6.3.   *Empirical results*

The real wage equations presented are reduced forms. The theory of bargaining is used only to find out which variables should be included in the regressions. We shall, however, impose a few restrictions. First, it can be shown that in union/bargaining models, the variables making up the wedge between the product real wage paid by the employers and the real after-tax wage received by employees, as defined in equation (1) should all enter with the same coefficients in the real wage equation (5) (Bean, Layard and Nickell, 1986; and Calmfors and Forslund, 1989). This means that we could try substituting the wedge variable q from equation (1) for the tax variables and the relative price of imported goods in (5). Second, we shall as did Bean et.al. (1986) enter the capital-labour ratio rather than capital as an explanatory variable, the idea being that the capital stock must increase faster than labour in order to affect real wages.

Lags in real wage adjustment are somewhat inconsistent with the key ideas of the models for centralised wage bargaining. We nonetheless initially allowed for a lagged dependent variable in our regressions. It turned out that its inclusion or exclusion did not affect the other coefficients much. As the lagged real wage was not significant in the more elaborate specifications, it does not appear in our preferred equations.

As important as what is in the real wage equation is what is not. A frequently offered motivation for studying nominal wage changes is that this is what the negotiations are about even though both parties ultimately are concerned about the real wage outcome. But what this really implies is that the dependent variable should be the *expected* real wage.

One way to take price expectations into account is to have a model for them and to use the price level forecast in the construction of the dependent variable. Another is to have the actual real wage as the dependent variable but to include the difference between the actual and expected changes in the price level as an independent variable. In the latter case, the real wage falls (or rises less than wanted) when actual inflation exceeds the expected rate. Although we cannot claim to have exhausted all possible measures of inflationary expectations, we came to the tentative conclusion that the expectational errors appear to play no role.[4] For instance, the conventional proxy for expectational errors, the change of the actual inflation rate, produced systematically wrongly signed and badly determined coefficients.

This does not mean that expected inflation would be of no significance. The background documents prepared for each negotiation round include information on expected inflation and it appears that there is a rather wide consensus about their reliability between the negotiating parties. Except for the early 1970s, these forecasts generally have been close to the actual outcome.

Throughout we have assumed that wage drift is perfectly foreseen, *i.e.*, it is taken into account when the negotiated wage increase is agreed upon. Although it seems clear that a major part of the wage drift is anticipated, it does not necessarily imply that the drift can entirely be abstracted from. Below, we will present some tests of this assumption using the procedure proposed by Flanagan (1989).

In the regressions shown no separate measure of technical change is included. We did experiment with the time trend as well as with some other proxies *à la* Layard and Nickell (1985), but their contributions to the equations were small and statistically insignificant, the only effect being a somewhat smaller coefficient for the capital-labour ratio. Nor did we include any determinants of bargaining strength or the fall-back levels of utility. The main reason was the difficulty of finding good proxies, except union density in some equations. However, to the extent that one believes in trends of these variables, the failure to find significance for time trend variables might be taken as an indication that these factors have been of minor importance.

Table 3 shows the estimation results obtained when the real after-tax consumption wage is the dependent variable and capital-labour ratio, unemployment, the wedge, regular working time, and unemployment benefits are the explanatory variables.

In the absence of specification search the results appear quite satisfactory. Although there are some problems with multicollinearity, two independent variables, the capital-labour ratio and unemployment, show up strongly irrespective of the inclusion or exclusion of other variables. The capital-labour ratio appears to be the fundamental trend factor and its coefficient estimates are centered around unity. The unemployment rate affects the real wage's movement around this trend. The wedge obtains a coefficient close to minus unity, which implies that increases in the wedge are more or less fully shifted back to the consumption wage of workers. Reductions in regular working time have a positive effect on the real wage, implying that employees succeed more or less fully to offset ther effects on the real wage incomes from working-time reductions by increasing wages per unit of time. Real unemployment benefits, which are entered with a lag, carry a negative sign, contrary to the prediction of the theory. However, it changes sign when union density is added to the equation. The latter, in turn, is insignificant when unemployment benefits are dropped from the equation. The same applies to unexpected inflation.

Table 3. Real wage equation estimates

6.4.   *The unemployment variable - a closer look*

All our tests support the inclusion of unemployment as an
explanatory variable in the real wage equation. It also
turned out that the fit becomes slightly better when it
is included in logarithmic form.[5]   This means that the
effect on the real wage of increases in unemployment
becomes smaller at higher levels of unemployment. Thus,
for instance, according to the estimates in column (1) in
Table 3, an increase in unemployment from 2 to 3 per cent
would lead to a 1.3 per cent decline in the real wage,
whereas an increase from 5 to 6 per cent would lead to
only a 0.5 per cent reduction.

In order to examine whether different types of
unemployment have different effect on real wages, we
estimated the real wage equation with some alternative
unemployment variables. First, we excluded all persons
receiving unemployment pension from the unemployment
measure. The rationale for that is that these persons are
not actively seeking employment and hence should not really
be included in the labour force[6]; less than a promille
of all unemployment pensioners have so far returned to
work. Prior to 1980 the number of unemployment pensioners
was so small that its effect on the overall unemployment
rate was negligible. Their number has increased
substantially in the 80s, as can be seen from *Figure 12.*
The short period with a large number of unemployment
pensioners may explain why the estimated coefficient for
the adjusted unemployment rate does not differ from that
of the unadjusted rate. Thus, accounting for unemployment
pensioners does not add anything to the real wage equation,
in fact its standard error slightly increases.

Figure 12. Rate of unemployment and
unemployment pensioners

Figure 13. Unemployment by duration

Secondly, we disaggregated unemployment by duration. As noted above, we found some support for a logarithmic formulation according to which changes in unemployment have a smaller impact on the real wage at higher levels. A possible reason could be that the long-term unemployment rises with the unemployment rate. Workers who have been unemployed for a long time are likely to carry less weight in the wage negotiations or these workers may experience such loss of work skills and morale that they ought to be subtracted from the effective aggregate supply of labour. In both cases long-term unemployment adds a lot to the unemployment rate but less to its effect on wages.

Data on unemployment by duration is available from 1968 onwards only, and so we have to use a shorter estimation period for the experiments with unemployment of differing durations. This is somewhat problematic because of the severe multicollinearity. As can be seen from *Figure 13*, the time series profiles of the short-term (less than 3 months), medium-term (3 to 6 months) and long-term (over 6 months) unemployment rates are quite similar and the correlations between them are high.[7] *Table 4* summarises the results from our experiments with the three unemployment categories.

Table 4. Real wage equations with differing duration of unemployment

The case for using the logarithm of the rate of unemployment is weaker here, and so this transformation has not been applied in the Table.[8] What the equations appear to show is that unemployment of differing durations do have differential effects upon the real wage. Intermediate unemployment has a strong negative effect whereas the other two duration categories have, somewhat surprisingly, a positive, albeit much smaller, effect. The high correlation between the three unemployment rates may explain the peculiar sign pattern obtained.

Adding together the short-term and medium-term categories or the medium-term and long-term categories or excluding the long-term rate lead to increases in the standard errors of the equation. Although the estimates are rather imprecise and we have relatively few observations, they do suggest that an increase in the number of long-term unemployed (over 6 months) does not have a negative effect on real wages whereas an increase in short-term unemployment has such an effect.

In trade union models it is assumed that the employment prospects and the outside income opportunities of the *union members* are central to the determination of the wage demands. The potential significance of the number of non-members and their employment and income prospects are usually ignored. This assumption is, of course, made for analytical convenience only, but in transition to empirical work some account for the non-members has to be taken. One way to proceed is to assume, as do Nickell and Andrews (1983), that the union takes social responsibility for a fixed pool of workers some of which need not be union members. At more aggregate levels, this pool could, for instance, be equal to the whole (sector's) labour force. This is probably the motivation behind the common practice of using the total unemployment rate as a measure of the employment prospects in empirical trade union models.

It seems equally reasonable, however, to expect that the members weigh more than non-members in wage negotiations. The extreme version is that only the prospects of the currently employed members matter as in the insider-outsider models (Lindbeck and Snower, 1985; and Blanchard and Summers, 1986). However, this assumption may be somewhat extreme. For instance, Carruth and Oswald (1986) have shown that it may be beneficial to the insiders to "let in" some outsiders during booms and not to raise their own earnings.

The study by Jones (1987) of a union which desires an increase in its membership also casts some doubts on some of the predictions of the insider-outsider models.

Thus it may be of some interest to take a closer look at whether the wage bargaining outcomes are affected more by the unemployment rate of the trade union members than by that of the the non-members. As mentioned in section 2, the unemployment rates of union members and non-members have developed quite differently during the period under study, which gives us an opportunity to examine the above-mentioned issue.

When the unemployment rate of unionised labour was substituted for the total unemployment rate, the former attached a numerically larger coefficient (*Table 5*). This measure of the unemployment variable leads to a slightly better fit in terms of the standard error of the equation. This reflects mainly an improved fit for the latter part of our sample. When the equation was expanded to include the unemployment rate of non-members as well, the explanatory power of the equation did not increase. Standard tests rejected the equality of the coefficients as well as the inclusion of the non-members' unemployment rate.

Table 5. Real wage equations with alternative unemployment variables

Having demonstrated that the composition and type of unemployment matters for wage formation, we next briefly mention a case in which it does not. Inspired by Calmfors and Forslund (1989) we experimented with a broader measure for unemployment by adding to it the number of persons in special employment and labour market programmes. This should shed some light on the issue of whether the attempts by the government to offset open unemployment in this way result in higher wage demands. The fact that we were unable to find any separate effect (neither by including an "adjusted" unemployment rate nor when "open" and "disguised unemployment was entered as separate regressors) of the labour market programmes on private sector wages is not surprising in the case of Finland taking into account their limited scope and the generally non-accommodative nature of fiscal policy during most of the sample period.

6.5.   *The wedge factors*

So far we have looked at the effects of taxes and relative import prices through the wedge term. It might be worthwile to investigate whether the data accept the restriction on the coefficients for the components of the wedge implied by this procedure. Before turning to the results two problems should be pointed out. The first one is that the total wedge effect is somewhat sensitive to the choice of the sample period. In particular, when the sample is split at 1969, the coefficient of the wedge decreases for the period 1969-85. This is not totally unexpected, however, as previous studies (Asplund, 1986; and Ingberg, 1986) have pointed to the temporal instability of the estimates for the tax rate effects.

It is conceivable that the large incomes policy packages of the tripartiate negotiations from 1969 onwards could have changed the way tax changes influence wage demands. In many of these agreements the purpose,

for which the revenue from an increase in e.g. payroll
taxes is to be used, has been stated. If the revenue is
used to finance measures which directly or indirectly
benefit the unions or their members, the unions may become
more willing to give up wage increases in exchange for an
increase in the payroll tax or to refrain from
compensation for an increase in the income tax. Another,
simpler and perhaps more reasonable explanation is that
there is too little variation in the total wedge during
1977-85 for it to show up in the regression analysis.

The second problem is that due to the specific
incomes policy pursued by the government since the mid-
1970s, the income and payroll tax rates have not always
been predetermined variables. Tax rates have sometimes
been set before the negotiations, sometimes as part of
the incomes policy package, and sometimes after the wage
agreements.

Table 6 contains the results from estimations
with the wedge replaced by the tax rates and the relative
import price. They appear quite encouraging; the
coefficients are significant and their signs are in
accordance with our priors. The relative price of imported
goods, attaches a numerically small coefficient, confirming
the results obtained by Tyrväinen (1988) and Pehkonen
(1988). The coefficient of the payroll tax rate is smaller
than minus unity but has a large standard error, whereas
the coefficient of the average income tax rate which is
estimated to be close to unity is fairly precisely
estimated. The restriction that the (absolute values) of
the two tax coefficients are equal to unity but have
opposite signs is easily accepted by a F-test. The results
from *Table 4* lend additional support to the view that
payroll and income tax increases are completely shifted
back onto the after-tax real consumption wage,

thus leaving the real product wage unaffected. This is a rather striking result and is clearly at variance with Ingberg's (1986) findings, according to which payroll and income tax rate increases are only partially shifted on to the real take-home-pay of workers.

Table 6. Estimation results with disaggregated wedge factors

It should be kept in mind that the average income tax rate alone fully characterizes only a proportional tax system. Recognition of the progressivity of the Finnish tax-system implies that both the average and the marginal tax rates should be entered into the wage equation. Simply introducing (the log of) the marginal tax rate (for an average wage earner) as an additional regressor in column (3) in *Table 6* gives rise to a positive and significant coefficient estimate. Its economic interpretation is not clear, however, as this specification does not take the interdependence between average and marginal tax rates into account.

An additional reason for being cautious in drawing conclusions from the estimates obtained is that all the tax rates in our data have moved closely together. As a consequence, it may well be that the regression coefficients and the t-statistics for each tax rate derive from too few observations. However, the jackknife estimates we have calculated are very close to those reported in the table. So, this need not be a problem after all.

6.6.   *The policy regime effect*

Much of the discussion of the interplay between wage setting and government policies. Has dealt with the issue of whether accomodative fiscal policy reduces the need for moderation in wage settlements as mentioned in Section 4.1. The point of departure in these analyses is the assumption that in centralised bargaining, rational

wage-setters take the governments reactions to the wage outcome into account. If the government follows an accomodative fiscal policy strategy, wage setters will eventually learn this policy rule. As an accomodative policy gives rise to an increase in labour demand at each given real wage, the perceived costs of wage increases are reduced.

However, this conclusion follows from models, such as Calmfors and Horn (1986), in which unemployment is assumed to be of classical nature. Andersen (1987) instead considers wage setting in a right-to-manage bargaining model in which unemployment results from effective demand failures in the goods market. He shows that effective demand failures reduce the sensitivity of employment to real wages and therefore provide unions with an incentive to press for higher wages. Thus, a fall in aggregate demand does not create strong incentives for such wage moderation that would improve the employment situation. The adverse employment effects of a fall in aggregate demand can, however, be mitigated by means of expansionary demand management policies without leading to increases in real wages.

In view of our discussion in Section 4.1 this type of analysis does not appear particularly relevant to the interpretation of the historical record in Finland as fiscal policy as a rule has been procyclical. On the other hand, as discussed in Section 4.2 exchange rate policy has been accomodative, at least up to the late 1970s, after which there seems to have been a clear change in the exchange rate policy regime. The end of the monetary accomodation regime has also been repeatedly declared by the government and the Bank of Finland.

With centralised wage negotiations, an accomodative exchange rate policy may affect the behaviour of both the unions and the employers' organisations. When the government and the central bank resume responsibility for international competitiveness,

the employers' incentives to resist increases of money wage
costs and to bear the costs of strikes are weakened. As
for the unions, it might be argued that they should learn
that they do not benefit from a higher rate of wage
inflation as this does not lead to higher real wages. But
as stressed by Calmfors (1985), this does not necessarily
follow because there is the possibility that the government
in order to avoid inflation will not make exchange rate
adjustments. The argument also abstracts from the fact
that devaluations are made irregularly which implies that
the unions can achieve temporary real wage gains.

Operationalising the exchange rate policy regime
for empirical analysis is not straightforward. One might,
however, consider a shift in regime from 1976 onwards in
order to account for a change in the willingness to use
exchange rate policies to a accomodate money wage increases
from that date. As discussed above it is not at all clear,
however, that the declaration of a change in policy regime
was perceived of as a genuine change. Indeed, in 1976-77
expectations of a devaluation were strong and the monetary
authorities were not able to stick to the new rule; in
1977-78 the Finnish markka was devalued three times, the
total depreciation ammounting to 16 per cent. Another
devaluation by 10 per cent was made in 1982, formally as
a response to the devaluation of the Swedish krona.
There were also strong expectations of a devaluation in
1983 and 1986, which caused large currency outflows. In
these instances, however, the central bank did follow its
announced rule.

If the declaration of a non-accomodative exchange
rate policy did, in fact, have a moderating effect on
wage increases, a failure to account for it may lead
bias in the estimates of the effects of other explanatory
variables upwaras, since many of these and unemployment in
particular, have changed considerably since 1976. Other
examples are the rates of income taxation, the growth of
which slowed down around the same time.

A problem in this context is, however, that
fiscal policies have become more accomodative at the same
time as exchange rate policies may have become less so.
As discussed in Section 4, the earlier pattern of
procyclical fiscal policy has changed especially in the
80s. As a consequence, public sector employment has grown.
In fact, the net increase in total employment since the
mid-1970s has been almost entirely due to the increase in
public sector jobs. Part of the increase in unemployment
has also been accomodated by the introduction of heavily
subsidized unemployment pensions and other forms of early
retirement schemes.

In principle, testing for fiscal accomodation is
easy as it should lead to higher real wages, whereas
exchange rate accomodation should not affect the real
wage in equilibrium, only the money wage. However, as
pointed out to us by Lars Calmfors, the time profile of
real wages is in all likelihood affected by devaluations
at discrete intervals. Needless to say, testing for a
shift in the level of the real wage as well as for a
change in its time profile is quite demanding given the
few degrees of freedom available. So, we have not attempted
this but simply entered a dummy equal to unity for the
1976-85 period into the real wage equation. It received a
negatively signed coefficient estimate, but never attained
respectable levels of significance. Changing the period
to 1977-85 or 1978-85 does not change the results at all.
Therefore, we feel that nothing is lost by disregarding
possible policy-regime changes.

6.7.   *Differences in bargaining set-up*

As is clear from our brief review of the wage settlements
in Section 2, there is nothing one could label a "normal"
settlement. A number of settlements have been negotiated
at the industry instead of the economy-wide level, some
of the contracts have included indexation clauses, the
length of the contracts have varied, and so forth.

Furthermore, it has become a commonplace to talk about
the period beginning in 1968 as a distinct "incomes policy
period". It is natural, therefore, to ask whether
differences in bargaining structure and set-up matter.

Theoretical union and bargaining models provide
few, if any, hypotheses on these matters. There is a
debate about the advantages and disadvantages of
centralised and decentralised wage bargaining systems, but
it is not obvious that this has any bearing on the case
when centralised bargains are the rule and decentralised
ones the exception. A similar reasoning applies to contract
length, in connection with which the possible benefits of
multi-year agreement have been discussed. The discussion
about indexation has mainly been concerned with the
effects on price inflation and macroeconomic stability.

In order to shed some light on the above issues,
we have simply plugged some dummy variables into the wage
equation. Entering differences in bargaining set-up in
this crude fashion is unsatisfactory, however, as the
dummies are likely to be jointly dependent endogenous
variables. Failures to reach economy-wide agreements,
decisions to sign a one-year or two-year contract or to
have indexation clauses in the contract are, we think,
influenced by the prevailing economic environment.
Accounting for this will not, however, be attempted here.

A representative sample of coefficient estimates
for a number of potentially interesting dummy variables is
set out in *Table* 7. The estimates were obtained by
including only one of the dummies at a time into the wage
equation.[8] At conventional levels of significance none
of the coefficients differs from zero. The dummy for two-
year contracts comes closest to being significant and
carries a negative sign, which would lower wages in this
case. The dummy for decentralised bargains has a
coefficient of about the same magnitude but with the
opposite sign. The other dummies obtained very small
coefficients.

Especially noteworthy is the lack of significance for the comprehensive incomes policy period dummy, which indicates that there was no structural break as from 1968 and onwards as has been argued by some investigators (*i.a.* Halttunen, 1974; Paunio and Suvanto, 1981; and Blomqvist, 1981) using nominal wage change equations of Phillips-curve type.

Table 7. **Coefficient estimates for some bargaining set-up dummies**

The insignificance of the decentralised (industry-level) bargains is no surprise (at least to us) as the industry level negotiations merely have continued from the point where the preceding central negotiations ended. Moreover, the decentralised settlements have not differed much across industries with respect to the negotiated wage increases.[9] As the industry-level negotiations are exceptional (so far) and probably endogenous with respect to other variables, the finding that they do not matter, probably does not reveal anything about whether a permanent system with decentralised negotiations would affect wage setting differently than the current system.

6.8. *Does wage drift matter?*

As pointed out earlier, the preceding analysis rests on the assumption that wage drift, *i.e.* the difference between the total and the negotiated wage increase, is perfectly anticipated when negotiated wages are set. This means that although there may be additional factors affecting wage drift, these factors will have no effect on total wage increase. One way of testing this assumption, proposed by Flanagan (1989), is to split the total post- tax real wage into two parts; the negotiated money wage adjusted for income taxes and deflated by the consumer price index, and wage drift. The former variable can then

be regressed on the same explanatory variables as before
plus the wage drift. If wage drift has no independent
role, its coefficient should equal minus unity.

Following this procedure, we obtained the
coefficients for the wage drift term, which were not
significantly different from minus unity. For instance,
using a specification with the capital-labour ratio, the
wedge (the wedge factors), the unemployment rate of union
members, the real unemployment benefit and regular working
time as the other regressors, the wage drift coefficients
turned out to be -0.82 (-0.936) with a t-value of 2.29
(2.34). The other coefficients differed somewhat from
those obtained earlier, but not dramatically so. Moreover,
the explanatory power of the equation(s) became slightly
lower. Imposing the restriction that the coefficient of
the wage drift term equals minus unity led to some further
changes; in particular, the unemployment rate, the
unemployment benefit and working time now obtained
numerically larger coefficient estimates.

There is hence some comforting support for the
hypothesis that wage drift is taken into account when the
negotiated wages are set in the centralized bargains. It
should be noted, however, that this result differs sharply
from Flanagan's (1989) finding that total earnings in
Finland are market-determined. Obviously more research is
needed to resolve this issue.

7.   **Concluding remarks**

The modern theories of union behaviour and wage bargaining provide an attractive framework for analysing wage formation and its relation to macroeconomic adjustment in economies with highly organised labour markets and centralised wage setting. As often is the case, however, theories are helpful in explaining complicated economic phenomena, but their formal testing is not a straightforward task. Thus, we do not claim that the results presented here provide conclusive econometric evidence in support of the trade union/bargaining theory. However, we do think they are promising and encouraging.

We have found robust relations between the real wage and the capital-labour ratio, which should affect trend productivity, as well as the unemployment rate for trade union members. The results with respect to the wedge, which were somewhat sensitive to the choice of estimation period, and also those obtained when the wedge was split into its components, suggested that tax increases are completely shifted back to the real after-tax consumption wage. This finding, which confirms those of Tyrväinen (1988) and Pehkonen (1988) raises some doubts about the efficiency of using payroll tax cuts to lower wage costs: the result would seem to leave product real wages unaffected. A similar conclusion would seem to apply for income tax cuts.

The estimated effects of the real unemployment benefit and regular working time turned out to depend on the choice of specification. Taken at face value, they indicate that the effect of changes in real unemployment benefits are rather small, and as the benefit has been

falling since the beginning of the 1970s it has had (if any) a moderating effect on real wages. According to the estimates, a decrease in regular working hours by one per cent leads to an increase in the real wage of about one per cent, *i.e.* it would seem to leave real wage incomes unchanged. This points to serious risks of working time reductions from the point of view of wage costs.

We find no support for the hypotheses that differences in bargaining set-up and policy regimes should matter. This might, however, be because the effects of changes in institutional conditions and policy are difficult to capture since they are likely to be gradual.

The results we have presented can also be interpreted in another way. What drives the trend of real wages is long-run productivity growth. Variations in unemployment then explain the major fluctuations around the trend. The additional variables help to explain some of the remaining variance, which is however, only a tiny fraction of the total variance.

But on the other hand, what is important from a policy perspective is what causes the product real wage to move in and out of line with productivity growth. In that respect we hope that our finding that employment conditions - and in particular medium-term unemployment of union members - is the main determinant, whereas tax changes appear to have no effect (since they are shifted back on the real take-home-pay of workers), add to our understanding of wage formation in the Finnish labour market. It does, indeed, cast serious doubts on the effectiveness of using tax policies to buy wage restraint in the comprehensive incomes policy settlements. Naturally, this is an issue which warrants much further study. There is, however, a worrying gap between the conventional beliefs in such incomes policy settlements and the empirical research in favour of it.

NOTES

1)   The effects of higher unemployment benefits and more
        extensive labour market programmes on wages are as a rule
        weaker or ambigous in models, in which unions to some
        degree perceive the effects of their policies on the
        economy (cf. Holmlund and Lundborg, 1986; and Kemp, Leonard
        and Long, 1987).

2)   The unemployment insurance system is financed by
        contributions from the members, the employers and the
        government. The members' share of total costs of
        unemployment-insurance funds has been around one tenth,
        and the share has varied procyclically. The government's
        share has declined substantially since the mid-1970s,
        while the employers' share - which is not experience
        rated - has increased corespondingly. On the other
        hand, the unemployment assistance scheme is solely financed
        by the government. Taking this into account, the
        governments share of the total cost for unemployment
        compensation has risen, owing to the faster growth of the
        expenditures for unemployment assistance. As of 1980, the
        cost of the unemployment assistance system has exceeded the
        expenditures of unemployment insurance funds.

3)   Moreover, some of the explanatory variables used by
        Tyrväinen (1988) and Pehkonen (1988) are, in fact,
        available only in the form of annual observations.

4)   Tyrväinen (1988) had no success with the inflation
        expectation variable, either. On the other hand, Pehkonen
        (1988) obtained a coefficient of unity utilizing the
        predictions based on a price equation with lagged dependent
        variables and a vector of other variables (not reported)
        as regressors.

5)   As of 1986 the unemployment pensioners has also been
        excluded from the official unemployment and labour force
        statistics.

6)   The correlation coefficients between the short- and medium-
        term, the short- and long-term, and the medium- and long-
        term unemployment rates are 0.91, 0.42 and 0.69,
        respectively.

7)   However, the results were not much different when the
        equations were run in log form.

8) It should be noted that various combinations of dummies -
    including the case when they are all entered together,
    when there would in effect no single year for which all
    the dummies would equal zero - might well give rise to
    significant coefficients. It is not hard to think of
    pairs of dummies which could make sense; for instance,
    the two year contract and the indexation dummies may have
    no effect on their own, but in combination they may well
    have an effect. However, the number of possible
    permutations is high and there is also the possibility
    that introducing several dummies is extracting too much
    of the data.

9) A hackneyed joke told by people participating in the wage
    negotiations is that the only times there have been truly
    centralised agreements, in the sense that they have
    resulted in uniform wage increases in all sectors, is
    when the bargains have been struck at the industry level.

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APPENDIX: *Definition of variables and data sources*

W = the hourly wage rate for the private sector
Source: CSO

P = producer price index.
Source: CSO

P_c = consumer price index
Source: CSO

t_e = payroll tax rate
Source: NA

t_w = average income tax rate (calculated as direct taxes per wages and salaries for the household sector). Source: NA

K = net fixed capital stock for the sector.
Sources: NA, CSO

N = employment (the number of employees) in the private sector
Sources: Labour Force Survey, CSO

K/N = capital-labour ratio

h = regular working time
Source: Incomes policy in Finland 1950-86.
The Prime Minister's Office, Publication 1986/1

b = the unemployment benefit paid to breadwinners by the unemployment insurance funds.
Source: Ministry of Labour

u = the unemployment rate
Source: Labour Force Survey

Variables used without symbols:

Union density — the proportion of wage earners who are union members
Sources: CSO, Labour Force Survey

Marginal income tax rate — Source: Christian Edgren (ETLA)

Unemployment rates:
- short-term — duration less than 3 months
- medium-term — duration 3 to 6 months
- long-term — duration exceeding 6 months
Source: Ministry of Labour, own calculations
- of unionised labour — the unemployment rate of the union's unemployment insurance funds
Sources: CSO, Ministry of Labour

Table 1. Centralized wage agreements for manufacturing workers in Finland in 1942-90

no.	Name	Period	Form of index clause
1	Regulation of wages	1.10.42-11.1.45	2/3 compensation after thresholds
2	Regulation of wages	12.1.45-18.6.45	100 % compensation after thresholds
3	Regulation of wages	19.6.45-2.10.47	-
4	Regulation of wages	3.10.47-14.2.50	110 % compensation after thresholds
5	Decision on wages/governm.	15.2.50-7.5.50	-
6	Fagerholm-agreement	8.5.50-28.9.51	100 % compensation after thresholds
7	Aura-agreement	29.9.51-31.12.55	+15 % and 100 % compensation after thresholds
8	SAK/STK	1.1.56-1.7.57	-
9	Union level	1.8.57-31.12.58	2/3 compensation after thresholds
10	Union level	1.1.59-21.12.59	-
11	Union level	1.1.60-31.12.60	-
12	SAK/STK	1.1.61-31.12.62	-
13	Union level	1.1.63-31.12.63	-
14	Ripatti-agreement	1.1.64-31.12.65	80 % compensation after thresholds
15	Hetemäki-Rantanen-agreement	1.1.66-30.3.68	100 % compensation over expected inflation
16	Liinamaa I-agreement	31.3.68-31.12.69	-
17	Liinamaa II-agreement	1.1.70-31.12.70	-
18	UKK-agreement	1.1.71-31.3.72	-
19	HL-agreement	1.4.72-31.3.73	-
20	Union level	1.4.73-31.3.74	-
21	Lindblom-agreement	1.4.74-31.1.76	-
22	SAK/STK	1.2.76-31.1.77	-
23	Liinamaa-agreement (rec.)	1.3.77-28.2.79	-
24	Somerto-Oivio-agreement	1.2.79-29.2.80	lump sum compensation after threshold
25	Union level	1.3.80-28.2.81	-
26	Pekkanen-agreement	1.3.81-28.2.83	100 % compensation over expected inflation limits
27	Union level	1.3.83-28.2.84	-
28	II-Pekkanen-agreement	1.3.84-28.2.86	100 % compensation over expected inflation
29	SAK/STK	1.3.86-29.2.88	100 % compensation over expected inflation
30	Union level	1.3.88-1.3.90	-

Table 2.   Tax scale adjustment
               and inflation

Year	Tax in-dexation	Consumer prices	Average earnings
1977	16	12.6	8.5
1978	13	7.6	6.8
1979	9	7.5	11.4
1980	7.5	11.6	12.0
1981	11	12.0	12.8
1982	12	9.3	10.6
1983	9	8.5	10.4
1984	8	7.1	9.4
1985	5	5.9	8.4
1986	8	3.6	7.0
1987	4	3.7	7.1
1988	2	5.5	9.0

Source: ETLA "Tax indexation" gives the percentage
          by which incomes corresponding to given tax
          rates have been adjusted upwards to reduce
          the real tax burden related to progressive
          taxation in an inflationary economi.

Table 3.   Real wage equation estimates

Explanatory variable	Coefficient (t-value)		
	(1)	(2)	(3)
Constant	16.033 (6.62)	13.652 (4.79)	15.804 (6.16)
Capital-labour ratio	1.093 (10.08)	0.965 (7.09)	1.095 (9.81)
The wedge	-0.896 (-5.24)	-0.943 (-5.61)	-0.885 (-4.97)
Regular working time	-0.926 (-2.83)	-0.618 (-1.63)	-0.904 (-2.65)
Unemployment rate	-0.031 (-2.22)	-0.030 (-2.28)	-0.030 (-2.13)
Real unemployment benefit	-0.013 (-0.53)	-0.113 (-1.46)	-0.012 (-0.45)
Union density		0.035 (1.23)	
Unexpected inflation			0.040 (0.37)

Statistics

R^2	0.992	0.993	0.992
SEE	0.017	0.016	0.017
AR (1)	1.27	1.11	1.77
AR (2)	1.33	1.24	0.21
NOR	0.55	0.47	0.30
HET	6.11	6.01	7.18
STAB	1.22	1.73	2.31

Explanations: The dependent variable is the post-tax con-
sumption real wage. All variables are in logs and the es-
timation is carried out using instrumental variables.
AR (1) and AR (2) are Lagrange multiplier test statistics
for the first and second order autcorrelation, respective-
ly. NOR is the Jarque-Bera normality test statistic. HET
is the Breusch-Pagan-Godfrey heteroscedasticity test stat-
istic and STAB is the conventional Chow test for parameter
stability.

Table 4.   **Real wage equations with differing unemployment durations**

Explanatory variable	Coefficient (t-value)			
	(1)	(2)	(3)	(4)
Unemployment rates				
Short-term	0.047 (1.32)		-0.041 (-3.12)	
Medium-term	-0.088 (-2.74)	-0.043 (-5.01)		-0.029 (-5.13)
Long-term	0.029 (1.64)	0.014 (0.97)		0

Explanations: Other explanatory variables were the capital-labour ratio, the wedge, regular working time and real unemployment benefits. Note that the unemployment rates in the table are not in logarithms.

Table 5.   Real wage equations with alternative
            unemployment variables

Explanatory variable	Coefficient (t-value)	
	(1)	(2)
Constant	14.939 (6.217)	14.821 (8.83)
Capital-labour ratio	1.058 (10.31)	0.994 (7.37)
The wedge	-0.882 (-5.34)	-0.882 (-5.09)
Regular working time	-0.792 (-2.50)	-0.805 (-2.53)
Real unemployment benefit	-0.006 (-0.25)	0.030 (0.55)
Unemployment rate of		
Union members	-0.038 (-2.55)	-0.095 (-1.99)
Non-members		0.039 (0.96)
Statistics		
R^2	0.994	0.994
SEE	0.015	0.015
AR(1)	1.31	1.20
AR(2)	1.35	1.05
NOR	0.84	0.36
HET	5.49	5.61
STAB	1.33	1.28

Explanations: See Table 3.

Table 6.   Estimates with disaggregated wedge factors

```
------------------------------------------------------------
Explanatory                      Coefficient
variable                          (t-value)
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```

Explanatory variable	Coefficient (t-value)		
Constant	14.578 (4.73)	16.003 (6.65)	6.562 (2.78)
Capital labour ratio	0.784 (8.89)	0.780 (8.99)	0.742 (14.17)
Unemployment rate (members)	-0.061 (-4.38)	-0.059 (-5.37)	-0.050 (-5.90)
Regular working time	-1.335 (-3.56)	-1.506 (-5.10)	-0.247 (-0.82)
Unemployment benefit	0.216 (2.68)	0.178 (2.86)	0.232 (4.90)
1 + payroll tax	-1.431 (-2.38)	-0.988* (-6.74)	-1.435 (-4.06)
1 - income tax	0.926 (5.45)	0.988* (6.74)	0.985 (9.82)
Relative import price	-0.056 (-1.90)	-0.065 (-2.41)	-0.037 (-2.11)
Marginal tax rate			0.320 (5.26)

<u>Statistics</u>

R^2	0.994	0.995	0.998
SEE	0.014	0.014	0.008
AR(1)	1.02	0.60	0.78
AR(2)	1.53	1.26	1.41
NOR	0.64	0.89	1.02
HET	8.86	7.71	7.04
STAB	1.59	1.41	2.45
REST		1.13*	

Explanations: REST is a t-statistic for testing the restriction of coefficients (marked by asterisk). Other explanations, see Table 3.

Table 7. Coefficient estimates for some
          bargaining set-up dummies

Dummy	Coefficient	t-value
Comprehensive incomes policy period	-0.005	-0.59
Decentralised bargaining	0.010	1.01
Two year contract	-0.013	-1.48
Contracts including indexation clauses	0.002	0.15
First year in two year contracts	-0.007	-0.89

Explanations: Other variables included in the
equation were: the capital-labour ratio, the wedge,
the log of the unemployment rate of union members,
the real unemployment benefit and regular working
time.

List of diagrams
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1. Annual change in money wages
2. Relative unit labour costs
3. Real consumption wages (for the private sector)
4. Real wage growth in the public sector
5. The wedge
6. Rates of taxation
7. The rate of unemployment
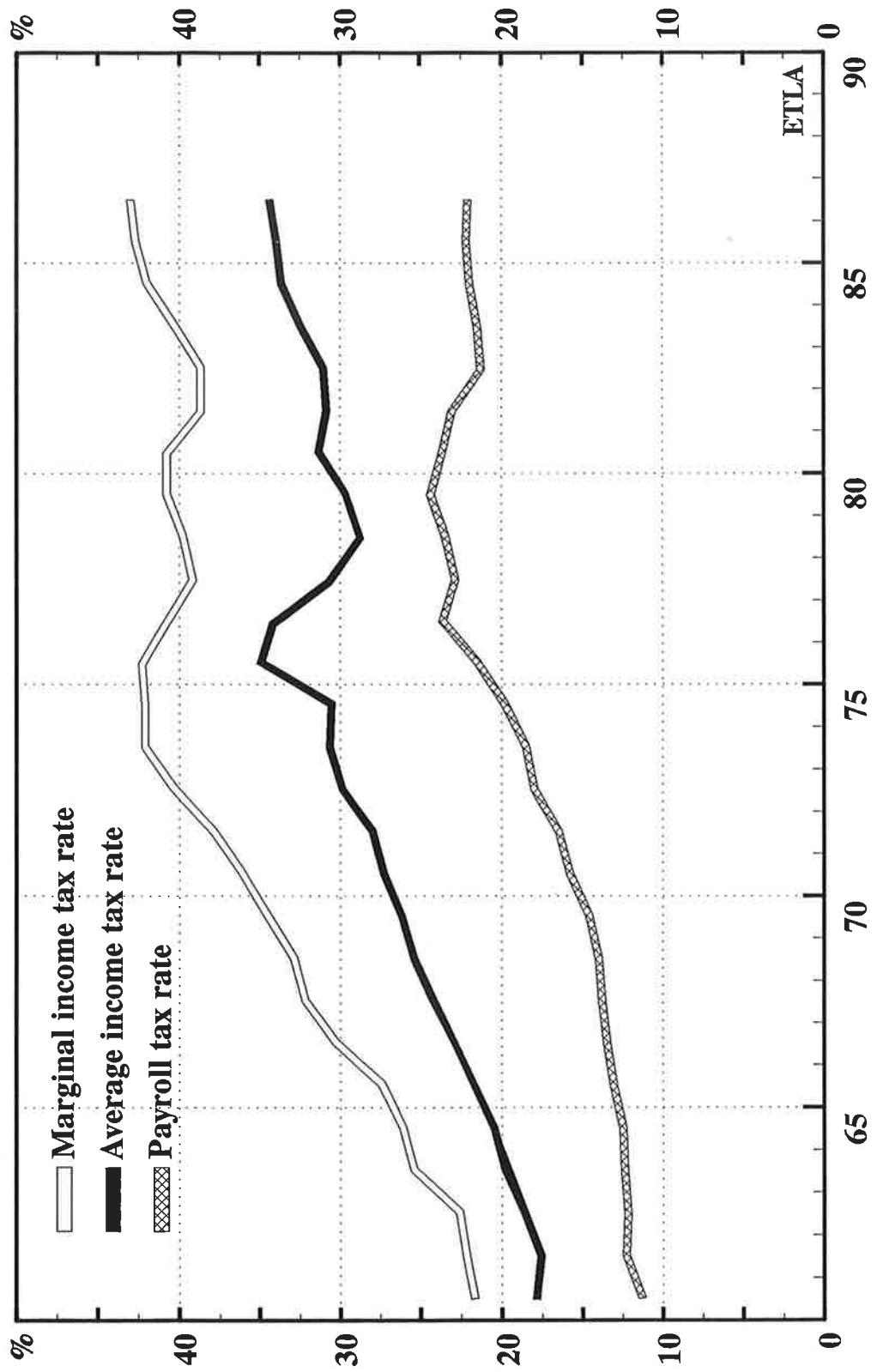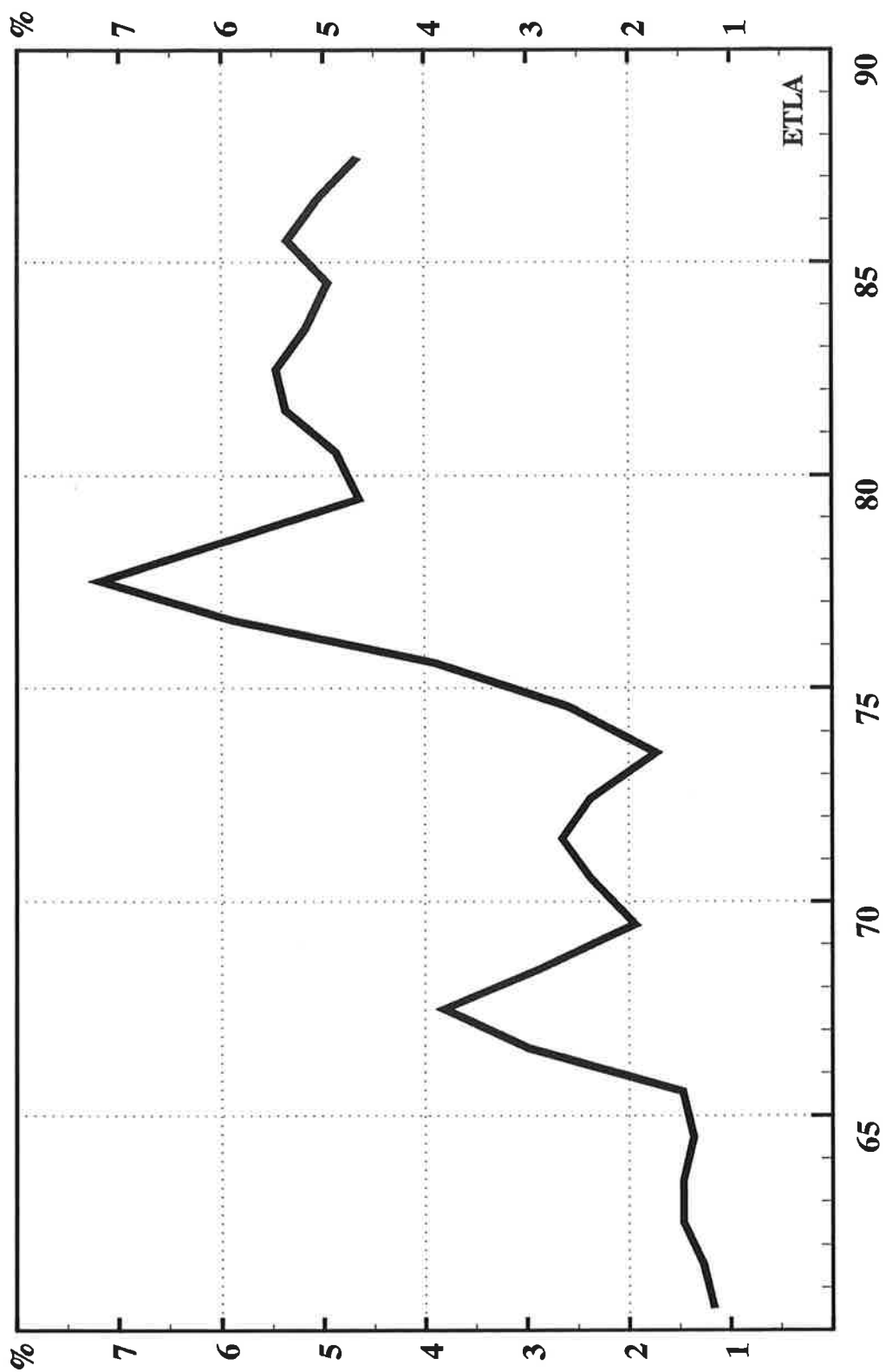8. Union density
9. Negotiated wage increases and the wage drift
10. Unemployment insurance
 a. Replacement ratios
 b. Real benefit index
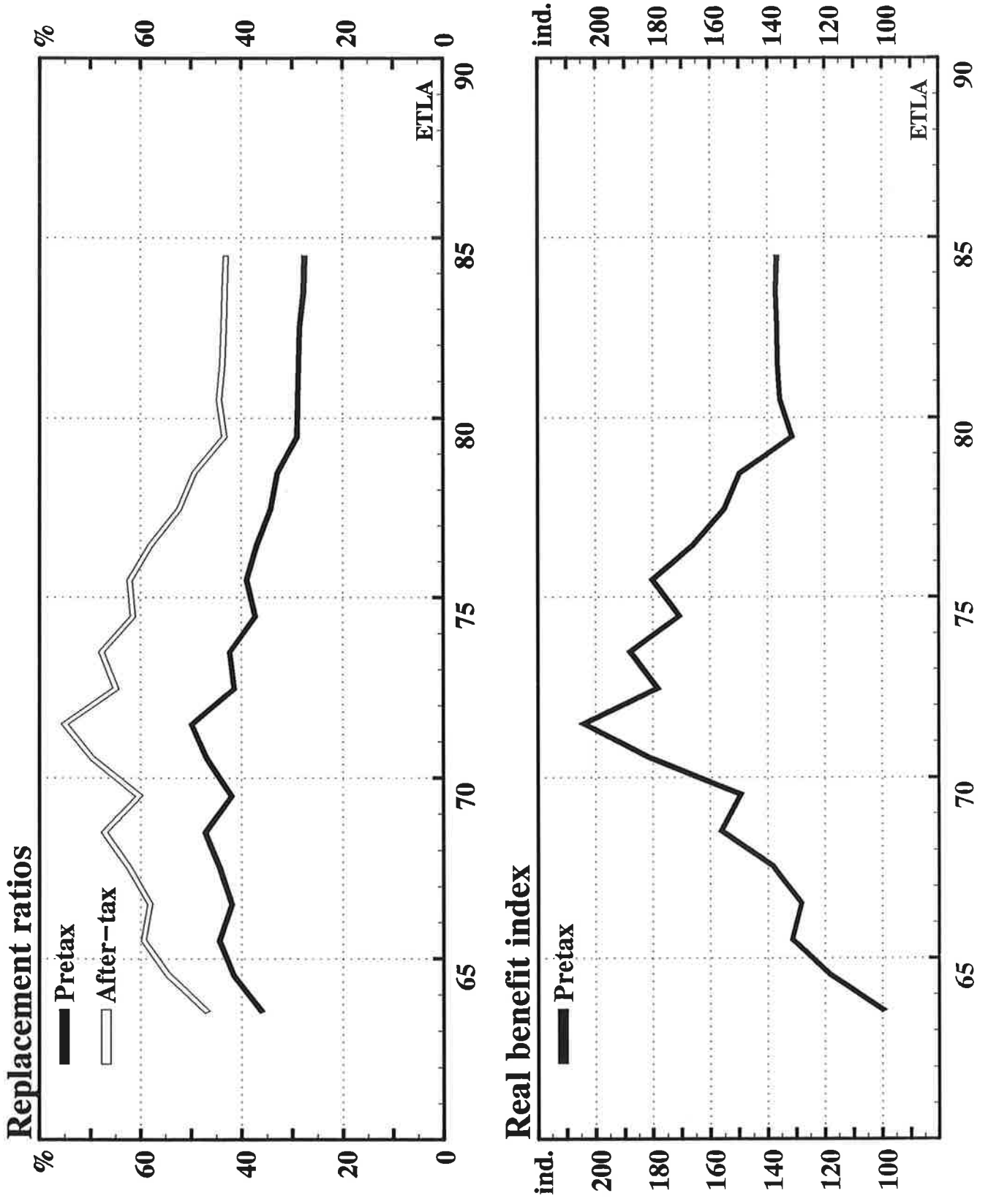11. Unemployment among insured and non-insured workers
12. The rate of unemployment and unemployment pensioners
13. Unemployment by duration

Figure 1. Annual change in money wages
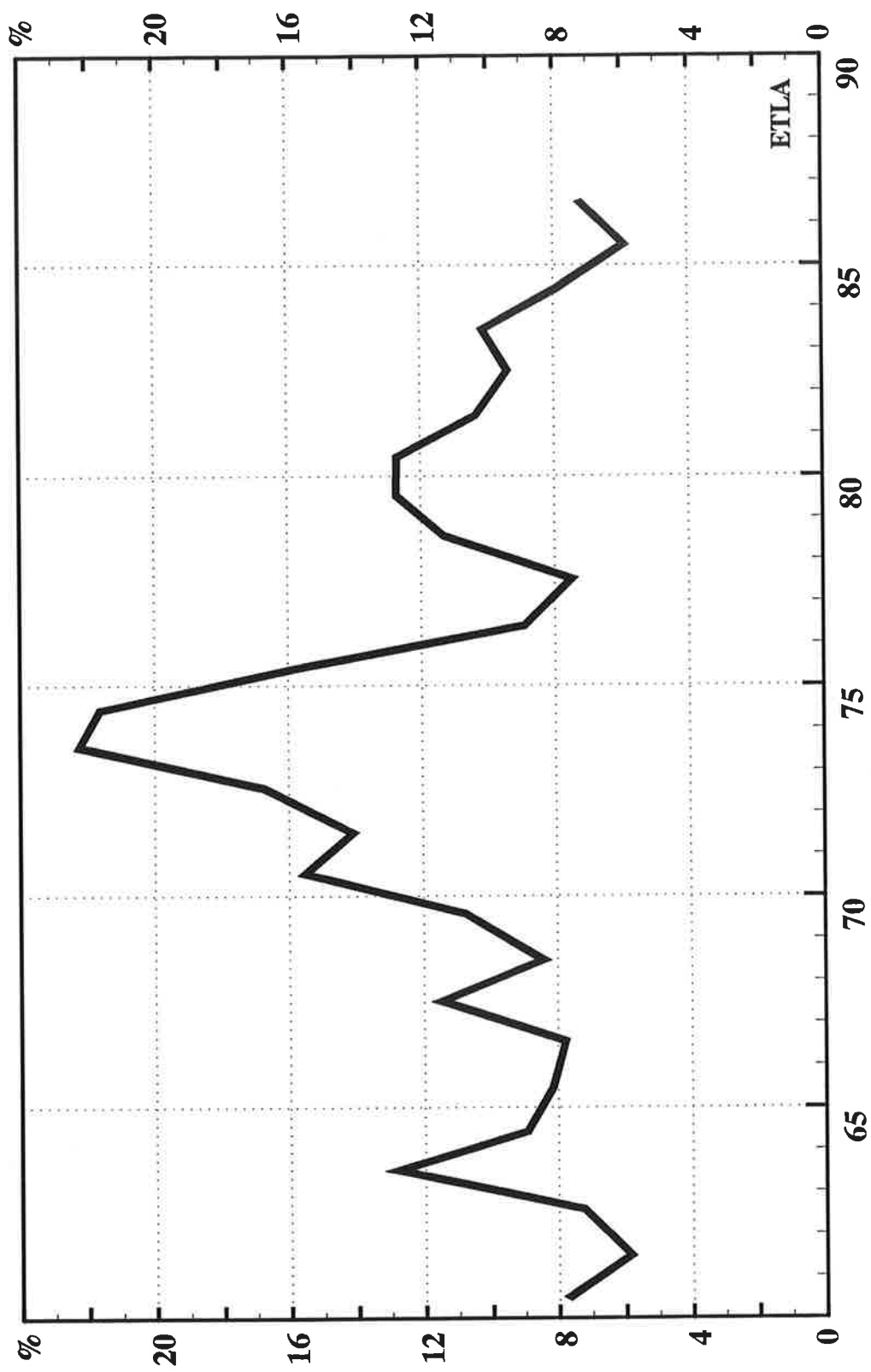
Figure 2. Relative unit labour costs decomposed
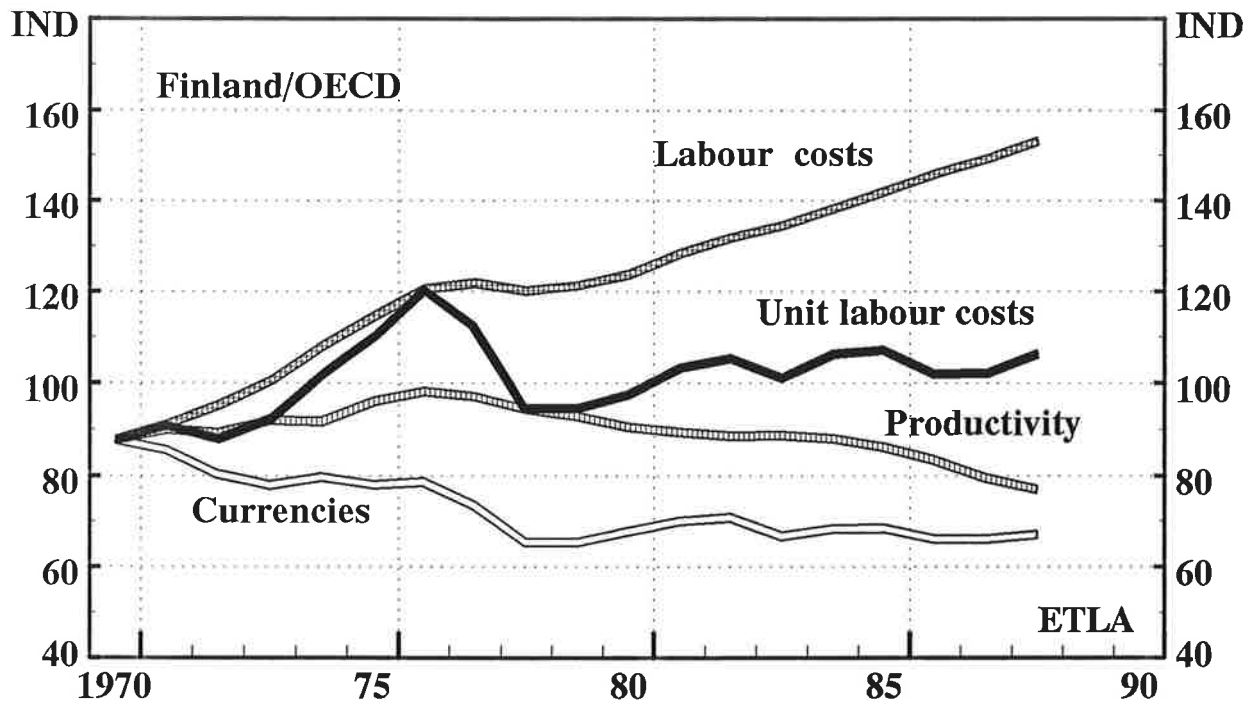
Figure 3. Real consumption wages in the private sector:
before and after tax
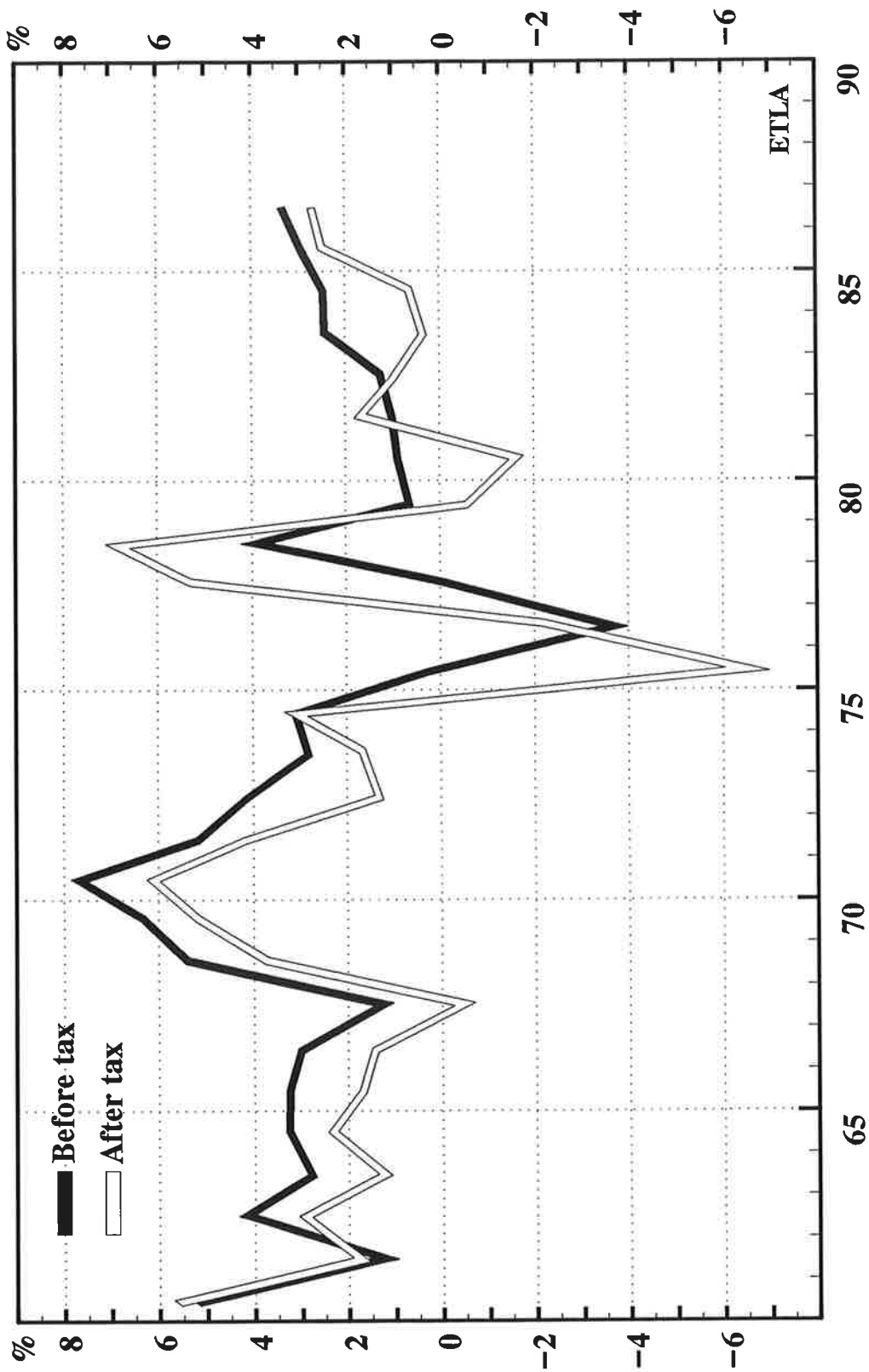
Figure 4. Real wage growth in the public sector

Figure 5. The wedge

Figure 6. Rates of taxation

Marginal income tax rate
Average income tax rate
Payroll tax rate

ETLA

Figure 7. Unemployment

ETLA
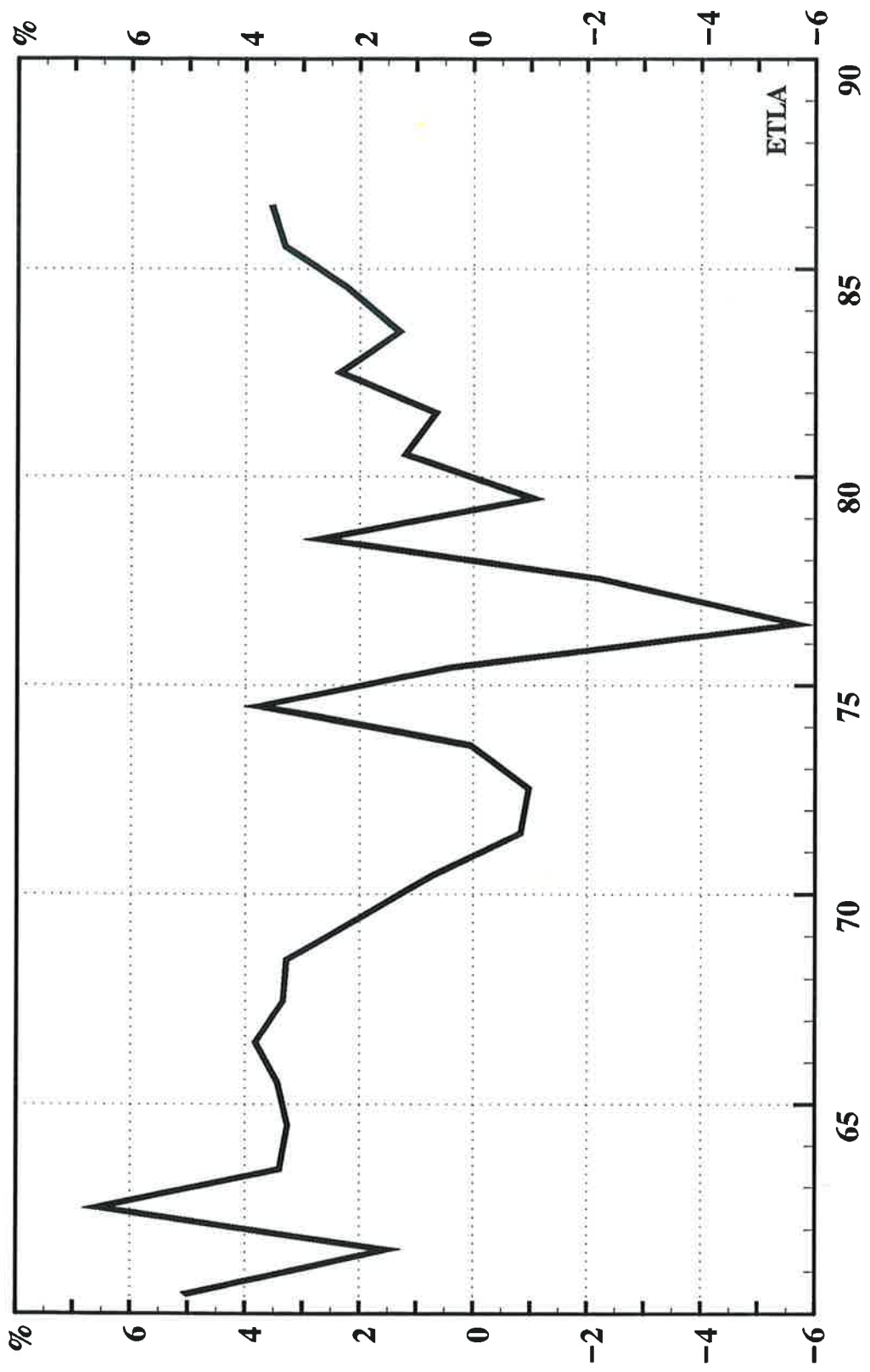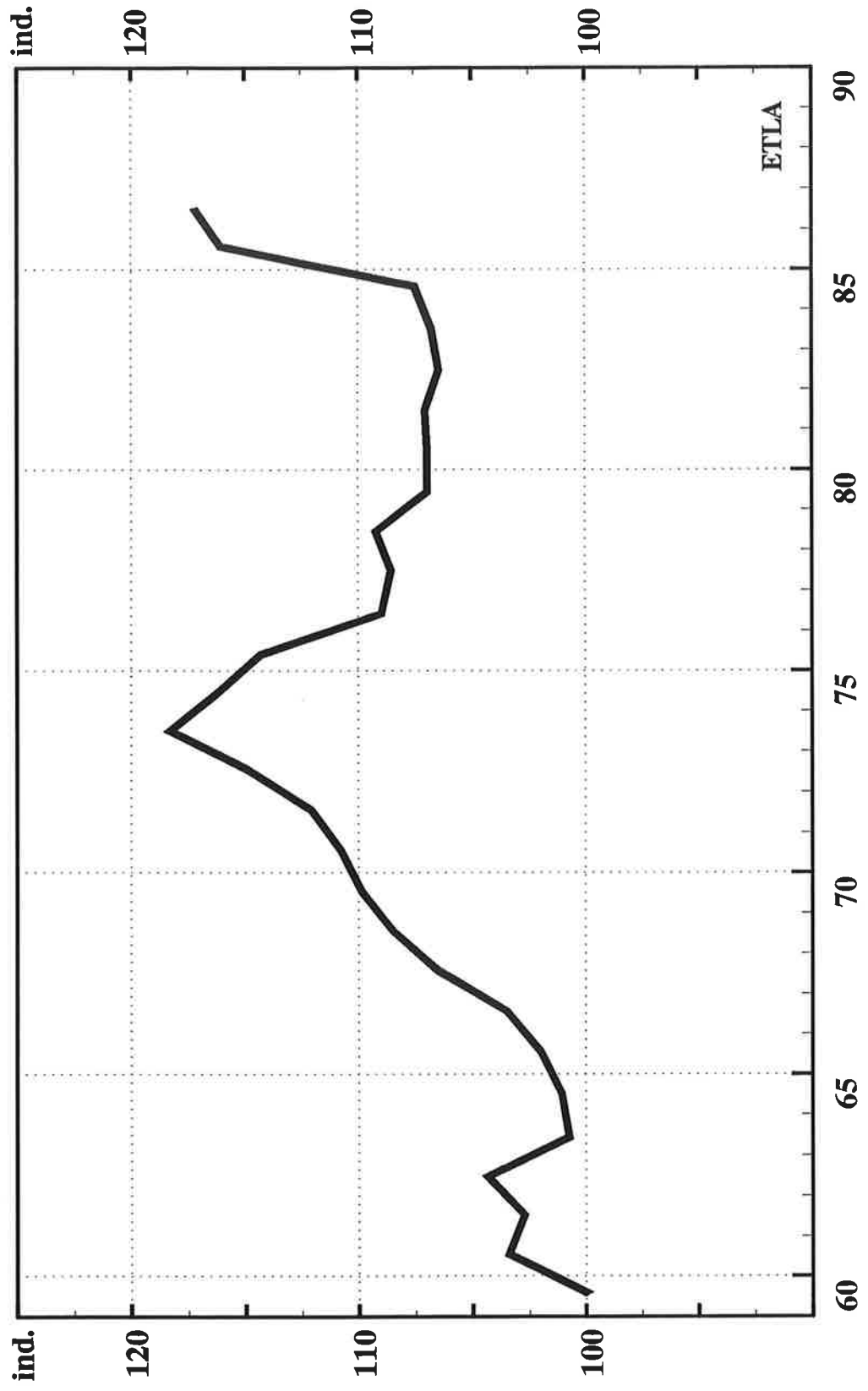
Figure 8.   Union density
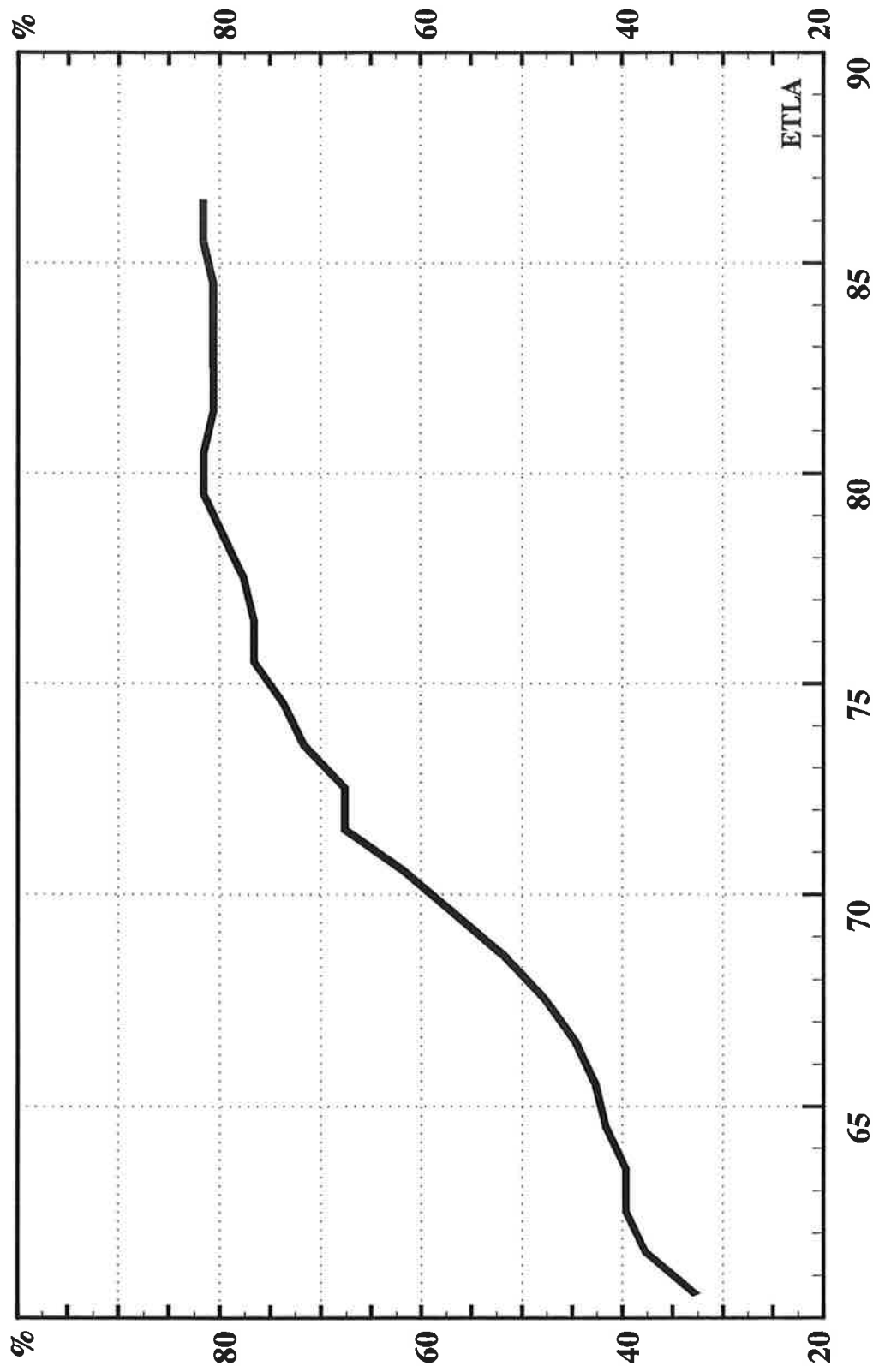
Figure 9. Negotiated wage increases and wage drift
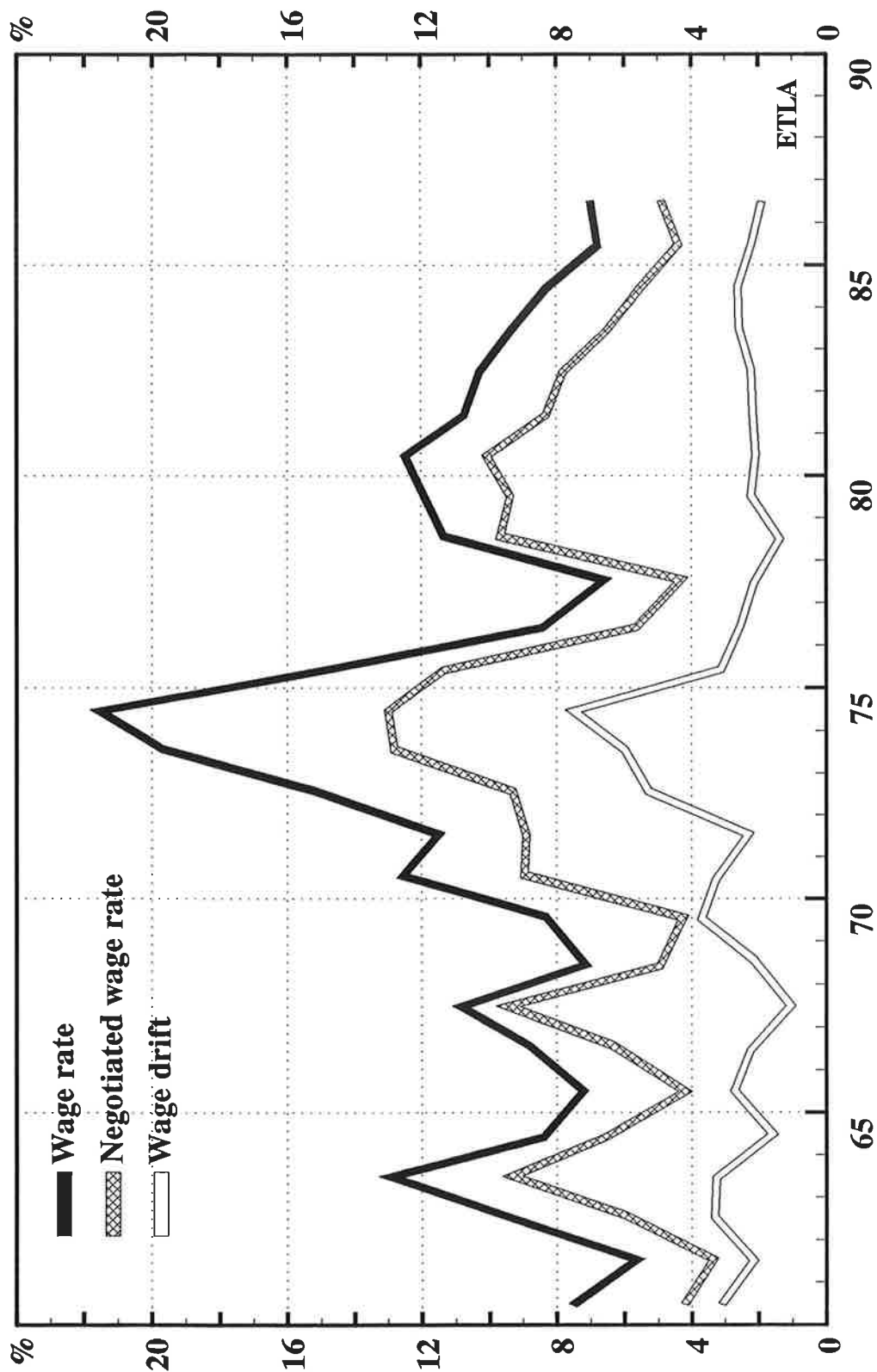
Figure 10. Unemployment insurance

Replacement ratios

Real benefit index

Figure 11. Unemployment among insured and non-insured workers
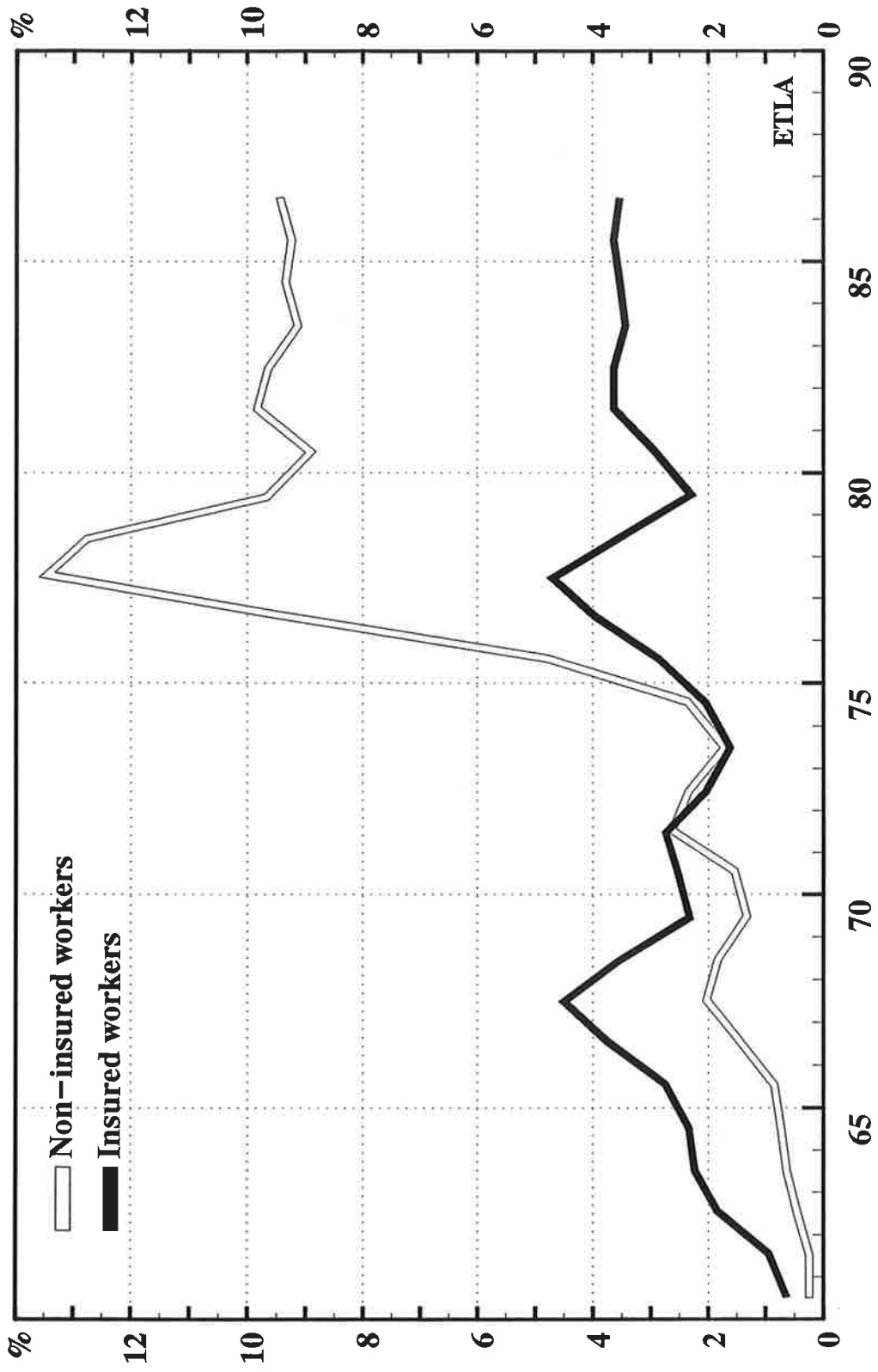
Figure 12. Rate of unemployment and unemployment pensioners

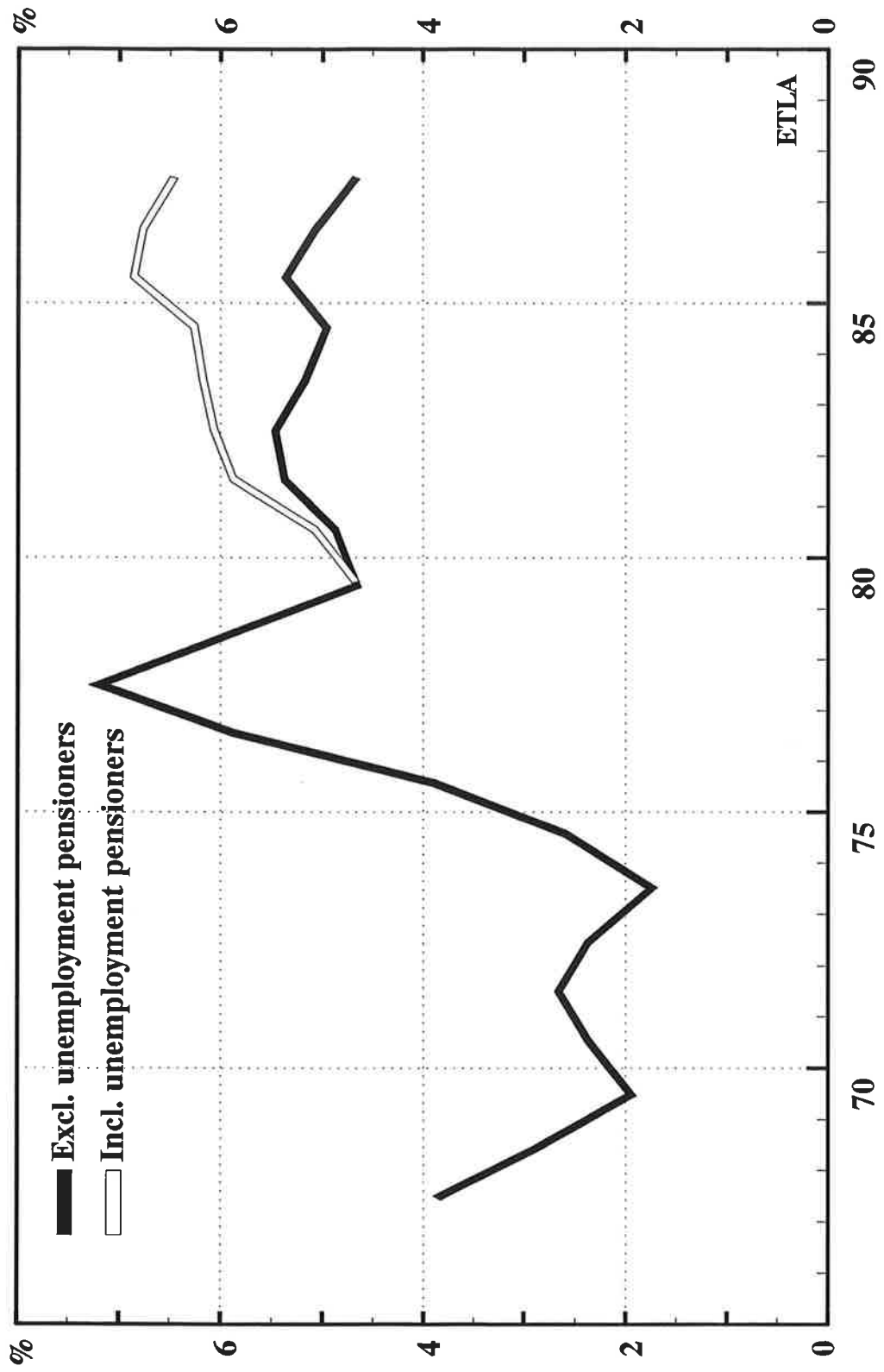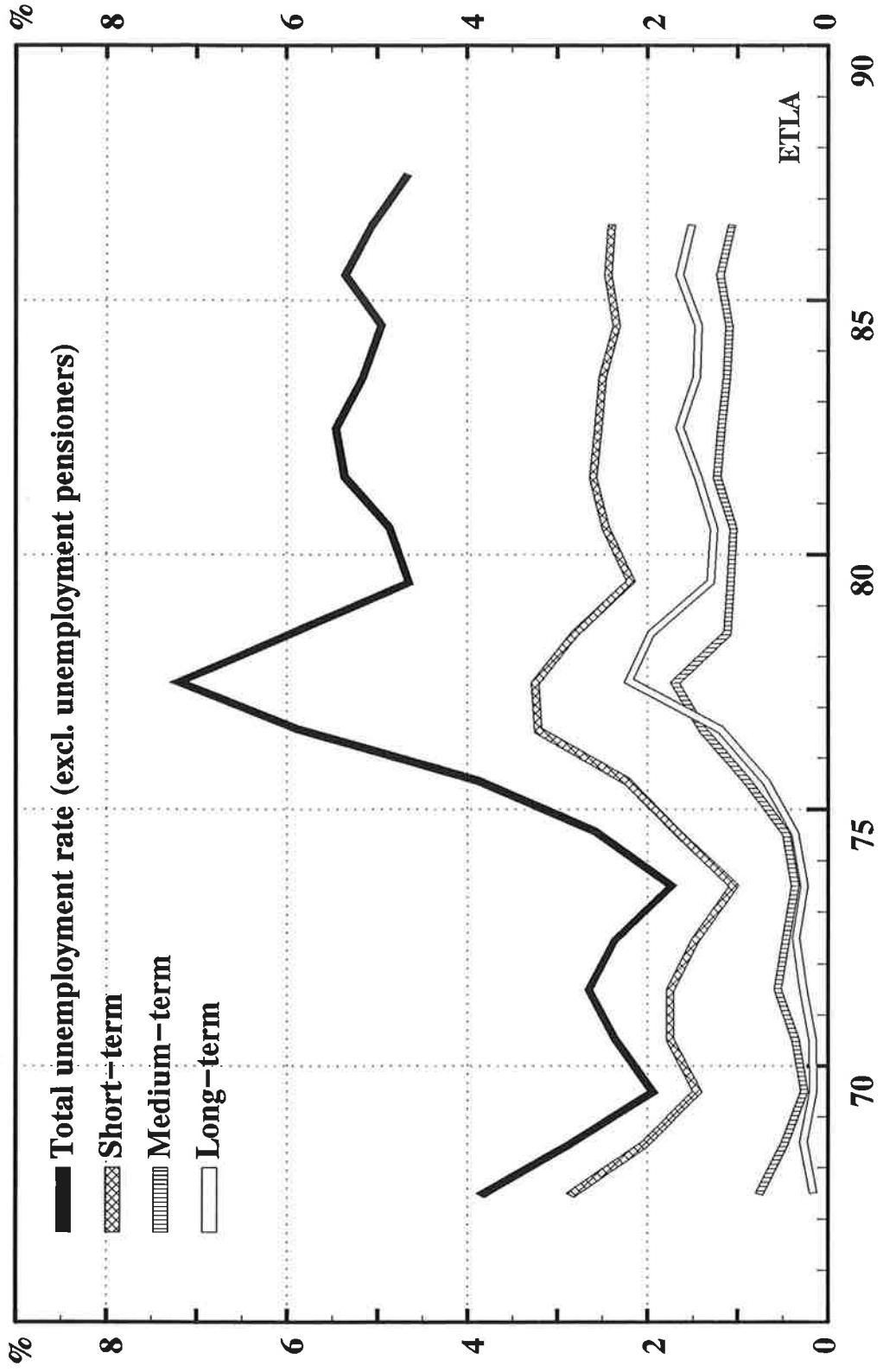# Figure 13. Unemployment by duration

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