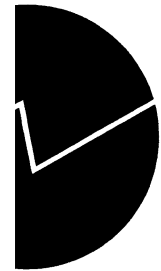


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**Effects on Wages from Changes
in Pay-roll Taxes in Norway**

Documents



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Abstract:

Reductions in pay-roll taxes have been proposed as a means to stimulate employment. The effect on wage formation is of great importance when analysing how employment will be affected. The paper presents a survey of this topic based on economic theory and empirical analyses of Norwegian data. Although the effect on wage formation is not precisely determined in any empirical analysis, most of the results indicate that a large part of general changes in pay-roll taxes is shifted over to wages in the long run in Norwegian manufacturing industries. This is in accordance with the Scandinavian theory of inflation and a rather non-elastic supply curve for labour towards manufacturing. The empirical analyses also indicate that wages at the regional level mainly are determined by countrywide factors. A geographical differentiation of pay-roll taxes for the rural areas may thus be beneficial for employment in these areas as wage costs are reduced.

Keywords: Fiscal policy, pay-roll taxes, wage formation, employment, regional economics

JEL classification: E24, E62, H22, H25, H32, R51

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1. Introduction

High unemployment has been a main concern for most European governments during the last two decades. A reduction in unemployment would imply a more efficient resource utilization and reduce social problems. Also in countries with well developed welfare systems, high unemployment involves large direct and indirect budgetary costs that may lead to unsustainable budget deficits if unemployment persists.

After a temporary increase during the first part of the eighties unemployment in Norway increased from 2.1 per cent in 1987 and reached a peak of 6.0 per cent in 1993. Although this level is not high compared to European standards, the government has declared that it is a main task to bring unemployment down. To find the best way to solve the problem and to create a common understanding among the different political parties and the labour market organisations, the government appointed an employment commission who published their report in summer 1992 (The Ministry of Finance (1992)). Although reductions in pay-roll and labour income taxes as means to reduce unemployment were discussed by the Commission, the main suggestions were:

- i) An income policy to keep wage growth down which also could create room for a more expansive fiscal policy without aggravating public budgets.
- ii) A shift in government expenses from transfers to public consumption which is more labour intensive.
- iii) Labour market measures to prevent / reduce structural problems at the labour market.

However, to stimulate employment without aggravating the budget the Parliament in December 1992 followed a proposal from the government and reduced pay-roll taxes by 2.4 percentage points financed by an increase in value-added taxes by 2 percentage points from 1 January 1993 (a so called internal devaluation). The policy of binding the Norwegian currency to ecu was also abolished, and this caused an immediate currency depreciation. A shift from pay-roll to green taxes has also been a central proposal in the debate about obtaining a so called double dividend (less pollution and higher employment). In Norway this debate was accentuated by the report from the Green Tax Commission published in summer 1996 (The Ministry of Finance (1996)).

When the Norwegian Social Security System was established in 1967, pay roll taxes were 7.0 per cent and common for the whole country. To finance the Security System and because more benefits (like sickness and unemployment) were included in 1971, the tax rate was increased every year from 1967 and reached 16.7 per cent in 1973. As a means to stimulate employment in remote areas, a geographical differentiation in the pay-roll taxes was introduced in 1975 with lower tax rates in the districts compared to the urban areas. Since then differentiation has more or less been continuously extended by establishing more zones and further reductions of tax rates in the most rural areas. From 1991 pay-roll taxes were completely abolished in some municipalities.

A central point when analysing the effects from reduction in pay-roll taxes (either as a partial policy or as a part of a package) is the effect on wage formation. If wages are highly compensated, this policy may have no direct effects at all¹, while the effects depend on the elasticity in demand for labour if wages are only weakly affected. The aim of this paper is to present a survey of our knowledge on this topic based on economic theory and empirical analyses of Norwegian data. Most of the empirical analyses are based on data at the national level, but a few studies also include the geographical dimension.

¹ But even in this case a reduction in pay-roll taxes may have a positive effect on employment when pay-roll taxes are reduced as a partial measure, because higher wages have a positive effect on private consumption.

2. Theoretical considerations

According to The Ministry of Finance (1992) almost 60 per cent of the Norwegian wage earners, or about one million persons, are organized in a countrywide trade union. The degree of organization has been quite stable the last decade, but has increased somewhat compared to the seventies. The Norwegian Federation of Trade Unions (LO) has been the dominating organization, but its relative importance has diminished due to a decreasing share of employment in those sectors (especially manufacturing) where a large share of the wage earners are members of the organization. Theories for trade unions may thus be important when analysing wage formation in Norway.

In the international literature, like Bruno and Sachs (1985), Calmfors and Driffil (1988) and Layard, Nickell and Jackman (1991), Norway is usually characterized as a highly centralized or corporative economy. But according to the Committee for Analysing Income Formation in Norway (The Ministry of Consumer Affairs and Administration (1988)) the degree of organization is quite low in many sectors, and in some sectors other organizations may also be important. In several sectors wage bargaining takes place both at the national and local level. For blue collar workers in manufacturing sectors wage drift², where local wage increases are the most important part, has contributed to more than 50 per cent of the total wage increases during the last decades. The share of wage drift increased from the mid-seventies until 1987. As a result of the price and income regulations in 1988 and 1989, wage drift was rather low in these years and stayed at a lower level than in the period before 1988, even in 1990 and 1991. From 1992 the share of wage drift has somewhat increased again.

Although some theories (especially theories for trade unions) may be more relevant than others when analysing wage formation and labour market in Norway, the description above illustrates a rather mixed structure. One single theory may only explain parts of the development, while supplements and modifications from other theories are required to get an overall understanding. As many employees are not organized, descriptions based on perfect competition may be quite relevant for this group, and perfect competition may also be a natural point of departure in analysing the demand side of the labour market. It may thus be natural to start with this theory as some kind of reference before presenting a more detailed survey of the theories for trade unions. In a small open economy like the Norwegian, the Scandinavian theory of inflation may also add important elements when explaining wage formation.

2.1. Assumptions of perfect competition

Under assumptions of a homogenous labour market with a lot of small agents equipped with perfect information employees are assumed to adjust consumption and leisure in such a way that utility is maximized for given prices, a budget constraint and a constraint on time disposable for work and leisure. Under some further assumptions the individual supply of labour may be aggregated to a macro supply function where supply of labour depends on real wages after tax (where wages are deflated by the consumer price index), real non-labour incomes and socioeconomic variables. Especially the complications imposed by the Norwegian system of income taxation may make it necessary to modify the approach when used in empirical analyses, as pointed out by Dagsvik and Strøm (1992).

On the demand side employers are assumed to choose input of labour and other factors in such a way that profit is maximized under assumptions of fixed output and input prices and a given production technology. From this demand for labour may depend on real wage costs (where pay-roll taxes are added to wages, and wage costs are deflated by a product price index), prices on other inputs relative

² Wage drift is defined as the residual between the total wage growth and central agreed increases. In addition to local increases wage drift may depend on the degree of contract work and changes in the composition of the workers. An increase in the share of employment in firms with a relatively high wage level inside the area will be registered as wage drift in this sector.

to product prices and parameters indicating technical progress. For the purpose of this paper it is important to note that one plus the pay-roll tax rate appears to be symmetric with product prices in a situation where labour is the only variable factor of production.

By combining supply and demand for labour we get a solution for equilibrium in the labour market where the supply and demand curve intersect. An increase in pay-roll taxes will shift the demand curve inwards giving lower employment and lower wages (before pay-roll taxes). Such a shift in the demand curve will cause a larger change in employment and a smaller change in wage rates the more elastic supply of labour is. Under assumptions of a simple proportional tax system there is also a symmetry between shifts in pay-roll taxes and income taxes. The effects on employment, disposable wages and wage costs are independent on whether it is the employer or the employees who actually pay the tax. It is thus not possible to obtain real effects by shifting from pay-roll to income taxes in this simple case. In a situation with a steep supply curve (supply of labour is not much affected by wages, which may be the case for men in manufacturing industries) an increase in pay-roll tax rates results in a relatively large reduction in nominal wage rates, while an increase in income tax rates only will be weakly compensated by an increase in nominal wage rates. On the contrary if the demand curve is much steeper than the supply curve, the burden is shifted over to the employers.

2.2. Theories of trade unions

In the last two decades a lot of research on wage formation (both theoretical and empirical) has been devoted to situations with trade unions. Surveys of the theoretical discussions are among others given by Oswald (1982 and 1985), Calmfors (1985) and Layard et al. (1991). Coordinated behaviour through trade unions implies that the unions have the possibility to collect and distribute information, and they may have the power to influence wage rates to be higher than under perfect competition. The literature distinguishes between two directions of theories:

- i) The union acts as a monopolist in the labour market and has the power to fix wage rates.
- ii) The union uses its power to negotiate with the employers.

In the first case³ it is often assumed that the employers fix the level of employment after wages are set. In the case of negotiations trade unions and employers may bargain about both the wage level and employment (efficient bargaining⁴), only the wage level while employers fix employment afterwards (right to manage⁵) and only the wage level where employment is fixed in advance (implicit profit-sharing). In Norway the right to manage model may seem relevant for manufacturing industries, while wage bargaining in the public sector is more close to implicit profit-sharing.

The theories also distinguish between central and local bargaining. A central trade union has to take the macroeconomic consequences regarding unemployment, price inflation and the balance of payments into account when negotiating about wages, while a local trade union only is concerned about the local effects on employment. When the behaviour of a trade union has macroeconomic consequences the situation may be characterized as a game between the union and the central government.

In the literature it has been common to assume that a trade union has stable and consistent preferences. A union may be concerned about the members' real disposable income, relative wage position, employment, income when unemployed, normal working hours, job security and the working environment. A central trade union may also take macroeconomic aspects as total employment,

³ See e.g. Mc Donald and Solow (1981) and Oswald (1985).

⁴ See also Mc Donald and Solow (1981) for a outline as a criticism towards the monopoly model.

⁵ See e.g. Nickell and Andrews (1983) and Hoel and Nymoen (1988).

inflation, economic growth, income distribution and the balance of payments into account. In most theoretical and empirical analyses it has been necessary to do some simplifications, but the main concerns of the trade union are maintained in analyses aiming at getting an overall picture of the most important factors for wage formation.

In the wage determination or negotiations the trade union is assumed to maximize the members' welfare by weighing the different concerns together and taking the response from the employers, eventually the central government and other trade unions, into account. In the most simplest cases employers are assumed to react according to the demand function for labour outlined in the theory of perfect competition above. A situation where employers act under a situation of monopolistic competition and thus are in a position to fix prices on their own products, as outlined in e.g. Layard et al. (1991), is probably more realistic.

The theory of trade unions is extended in several works by Lindbeck and Snower (e.g. 1989) as they distinguish between insider and outsider workers in order to explain why wages do not change to bring unemployment down. In the extreme case wages are assumed to be fixed by bargaining between employed workers (the insiders) and firms while outsiders play no role in the bargaining process. Insiders are assumed to be concerned with maintaining their job and do not care about the unemployed. In a more moderate case Nickell and Whadwani (1990) and Layard et al. (1991) in a bargaining situation about wages where firms fix prices and employment, show that firm specific factors like product prices, productivity growth and past changes in employment may influence the result.

A common result in the theoretical analyses of wage formation in the situation with trade unions is that an increase in pay-roll taxes works in the same way as an decrease in product prices and reduces wage growth. To what degree may depend on the trade union's preferences, production technology and the behaviour of the firms.

Opposed to the simple theory of perfect competition it is however not clear how an increase in income taxes may affect wages. On the one hand concern for real disposable income may indicate that wages increase. But a higher marginal tax rate means that the gain in marginal disposable income as a result of higher nominal wages declines relatively to the marginal costs of lower employment caused by the increase in wages. As pointed out by Layard et al. (1991, p. 108) this uncertainty may not appear if the trade union only compares the disposable incomes for those who are in work with the disposable income for the unemployed (or with other alternative incomes) and the tax change affects all incomes proportionally. In this special case workers bear the full burden of the tax.

A complicating aspect is that a trade union may care about the income distribution among the employees. If a trade union prefers a more even distribution of income, and if an increase in income taxes hurts those with the highest incomes most severely, the trade union may only demand a small compensation for the tax increase.

A central assumption from the neoclassical framework, which is also commonly assumed in the theories for trade unions, is the assumption of price homogeneity. This means that a proportional increase in consumer prices, product prices and alternative incomes should have no effect on the union's desired wage rate, and thereby employment as in the case of perfect competition. If there is symmetry between pay-roll taxes and output prices on the one hand and income taxes and consumer prices on the other, this homogeneity restriction imposes symmetry between pay-roll taxes and income taxes also in a situation where trade unions are important for wage formation.

The argument about symmetry is also in line with Hoel (1996). Hoel shows that when employers and trade unions are concerned about wage costs for the firms and the employees' real disposable income, it is only the total tax wedge that should matter and not its composition of different taxes. A simplifi-

cation in the discussion above with implications for the effects of changes in pay-roll taxes, is that firms are assumed to care about profits without taking into account that a change in wages can influence the effort and turn-over among employees. If effort and turn-over are influenced, as pointed out among others Akerlof (1982) and Shapiro and Stiglitz (1984) (regarding motivation and effort) and Salop (1979) (regarding turn-over), the effect on wages of a reduction in pay-roll taxes is more ambiguous.

As income taxes are balanced by government consumption and transfers, symmetry between income taxes and consumer prices is however not obvious. A progressive income tax system and concern among the trade unions about the distribution of income may further violate this. When other inputs than labour are taken into consideration in the firms' optimizing behaviour, this may also violate symmetry between pay-roll taxes and output prices. Although price homogeneity is fulfilled, this does not necessarily mean symmetry between pay-roll and income taxes.

2.3. The Scandinavian theory of inflation

A central element in the Scandinavian theory of inflation (see Aukrust (1977)) is the distinction between sheltered and exposed industries. This distinction may be important for wage and price formation in a small, open economy like the Norwegian. The exposed industries are those exposed to strong competition from abroad, either because they export most of their products or because they sell their products on the domestic market under strong foreign competition. Output prices for these industries are largely determined in the world market. They therefore cannot compensate for a cost increase through an upward adjustment of prices. The sheltered industries, on the other hand, sell their products at home without much foreign competition and may be able to compensate for cost increases by raising output prices.

The Scandinavian theory of inflation thus says that output prices (measured in national currency) in the exposed industries are determined by world market prices and the exchange rate. Output prices and productivity together determine the total surplus per unit produced available for distribution as wages or profits. Based on an assumption that the share of profit in these industries is constant in the long run, Aukrust argues that the wage level is determined by output prices and productivity. In the short run, however, the share of profit may show large fluctuations. But if the actual profit share deviates much from the normal one, both the system of wage negotiations and market forces will tend to close the gap.

Based on market forces and solidaristic wage policy by the trade unions, Aukrust (1977) assumes that wages in the sheltered industries follow wages in the exposed ones in some normal relation. In the sheltered sectors higher costs per unit produced may be passed over to output prices. Growth in productivity in the sheltered sectors may then reduce the effect on prices from growing wage rates.

An increase in pay-roll taxes has a direct effect on wage costs per unit produced. According to the Scandinavian theory of inflation this should reduce wages before taxes in the exposed industries to keep the share of wage costs constant in the long run. If wages in the sheltered sectors follow the exposed ones, wage costs and prices in these sectors may also be unaffected. It may, however, be hard to believe that wage costs in the sheltered sectors are completely unaffected, especially in the short run. Higher wage costs may thus be somewhat passed over into higher prices in the sheltered sectors.

3. Empirical results

The theories of trade unions suggest that the following concerns may be important for wage formation:

- i) The concern for real disposable incomes.
- ii) Growth in alternative incomes.
- iii) The concern for employment and thereby the firms' profitability and competitiveness.

The weight put on the different components may depend on the preferences of the trade union(s) and the trade union's bargaining power versus the employers'. The different concerns above are not in direct contradiction with the theory for perfect competition. Strictly interpreted the main concern in the long run should be on point iii) according to the Scandinavian theory of inflation, but this is an assumption which has to be tested empirically.

The concerns listed above have been a natural point of departure for most of the recent works regarding wage formation in Norway⁶. In addition unemployment is included as a specific factor in most of the works as an indicator of imbalances in the labour market and the probability to loose the job. According to economic theory homogeneity restrictions on the nominal explanatory variables are imposed in most of the works, and in empirical tests this restriction is seldom rejected as a long run restriction. The long run effects of pay-roll taxes are included symmetrically with output prices in most of the works, while income taxes are included symmetrically with consumer prices. The short run effects of these variables are usually estimated without restrictions.

Most of the empirical analyses concentrate on manufacturing industries as most of the manufacturing sector is exposed to foreign competition and has traditionally been regarded as a «wage leader» in the central wage settlements. The quality of data has also been higher for these industries than for the service sectors. In some of the works like Eitheim and Nymoene (1991), Langørgen (1993) and Stølen (1995), wage equations are, however, also estimated for these sectors.

As pointed out in section 2, wage bargaining takes place both at the national and the local level in several sectors. This subject has also been devoted attention in the empirical analyses for manufacturing by Holden (1989), Bruce (1989) and Bowitz (1989). The regional dimension is also considered in only a few works. Dyrstad (1992) presents the results from an analysis of the effects of the regional differentiating of the pay-roll tax rates on unemployment, while regional information is used in the analyses of wage formation by Wulfsberg (1993), Raaum and Wulfsberg (1995) and Dyrstad and Johansen (1996).

3.1. Analyses of total wage growth for manufacturing industries based on national data

A survey of the empirical analyses of total wage growth in manufacturing industries based on national data published before 1993, is presented and discussed by Stølen (1995, 149-150). Since then the results from the works by Johansen (1995 and 1996) may be added. It is a striking result that the various specifications differ very much regarding the long run weights on the different concerns listed above. Because of the symmetry restrictions these differences also show up in the long-run effects from pay-roll and income taxes. As the price variables are far more important variables (dominate because of the nominal growth over the period of estimation) than the tax rates, the choice of prices

⁶ Cf. Hoel and Nymoene (1988), Nymoene (1989), Coe (1990), Rødseth and Holden (1990), Calmfors and Nymoene (1990), Eitheim and Nymoene (1991), Nymoene (1991), Langørgen (1993), Elgsæther and Johansen (1993), Stølen (1995), Johansen (1995) and Johansen (1996).

may be decisive for the results, as pointed out by both Stølen (1995) and Johansen (1995). Nymoen (e.g. 1989) uses an aggregate import price index as a product price index as this may be the most relevant variable when the concern is about international competitiveness according to the Scandinavian theory of inflation. Langørgen (1993) and Johansen (1995) argue in favour of the factor income deflator because wage bargaining is about the shares of factor income. Both arguments are thus in accordance with economic theory, and there seem to be no major weaknesses in the empirical work.

In his analyses Nymoen reports a heavy weight either on the concern for real disposable incomes or alternative wages, while Langørgen and Johansen report a heavy weight on output prices. Because changes in wage costs is an important explanatory variable for changes in consumer prices, alternative wages and the factor income deflator, specifications including these variables may not be interpreted as «long run reduced form» specifications. Feedback effects also have to be taken into account. This is further analysed in Stølen (1995) by including the wage equations in a more complete model for prices and wages. The calculations show that there may be some problems with Nymoen's specifications regarding the long run effects of productivity growth and changes in taxes which are very much opposed to the Scandinavian theory of inflation. The factor income deflator specifications are more in line with this theory, but although the concern for profitability dominates, the results indicate that some weight may be given to real disposable income or alternative incomes. The most preferred wage equations indicate that 70 to 80 per cent of an increase in pay-roll taxes may be shifted over to lower wage rates in the manufacturing industries in the long run.

The main objection to the factor income deflator specification is that the concern for competitiveness vanishes. There thus seems to be a fight about the share of profit without taking international competitiveness into account. This is far away from the concern which has been offered to this point in the Norwegian public debate the last two decades. So import prices may be the most relevant variable after all, as also pointed out by Hoel and Nymoen (1988). One of the specifications analysed by Stølen (1995) (called the Phillips curve specification because of the connection between the level of unemployment and wage growth) is based on import prices and has almost identical long run marginal properties for the explanatory variables as the factor income deflator specifications mentioned above. But econometrically this specification seems to be somewhat weaker than the other suggested specifications.

The short run effects of pay-roll and income taxes are in most of the works mentioned above estimated without restrictions. In almost all the analyses it has been difficult to find significant effects. The effects may, however, depend on the choice of left hand side variable (changes in wages as in most of the analyses versus changes in wage costs as in Johansen (1995 and 1996)). Johansen thus report a significant positive short run effect on wage costs of an increase in pay-roll taxes, but the estimated value is less than one indicating that wage growth may be somewhat reduced in the short run when there is an increase in the pay-roll tax rate. The result is however not in opposition with the results from the analyses using changes in wages as the left hand side variable, as the effect from pay-roll taxes is imprecisely estimated in all the empirical analyses. As mentioned above the most favourable long run specification indicates a rather large effect from pay-roll taxes on wage rates, and according to Johansen's specifications the entire burden may be shifted over to the employees in the long run. No effect on wages from changes in income taxes is in accordance with this result when the symmetry restriction is valid.

The symmetry restriction between pay-roll and income taxes is imposed as a long run restriction in most of the works referred to above, and when tested in Stølen (1995) this restriction is not rejected. Because it may take some time before wages are adjusted to changes in taxes there is no reason to believe in symmetry in the short run, and this is also the case in most of the empirical works. Although a shift in pay-roll taxes may have some effect on wages in the short run, the instant effect is

a reduction in wage costs. A reduction in income taxes may have no such immediate effect. Even if there is symmetry in the effects from different taxes in the long run, a reduction in pay-roll taxes may be the most favourable in the short run because of its immediate effect on wage costs.

3.2. Analyses of wage formation in manufacturing industries based on regional data

Based on an analysis of the geographical differentiation in the pay-roll taxes Dyrstad (1992) reports that these tax-reductions seem to have had a positive effect on employment in the actual regions. At first glance this result seems to be in contradiction with most of the macroeconomic analyses mentioned above, but this is not necessarily the case. A common result in all the macro analyses is that a reduction in pay-roll taxes means a reduction in wage costs in the short run, and a majority of the analyses also indicate some effects even in the long run. The analyses by Wulfsberg (1993) and Dyrstad and Johansen (1996) based on regional panel data for manufacturing wages, however, indicate that regional wages mainly are determined by countrywide factors. Although regional wages are significantly affected by regional manufacturing profitability as well as regional unemployment, they report a long run insider weight between 0.05 and 0.2. This coefficient thus corresponds to the partial effect on the regional wage level of a change in pay roll taxes only affecting one region. A geographical differentiation of pay-roll taxes may thus have significant long run effects on the relative wage costs between regions.

Another major point is that the geographical differentiation took place as a partial decrease in pay-roll taxes without other taxes being increased. As shown in The Ministry of Finance 1992 and Stølen (1995) this might have stimulated private consumption in these regions if wage rates increased as a result of higher profitability. One possible limitation in the analysis by Dyrstad is that the effects from changes in pay-roll taxes on wage formation are not analysed in connection with the other factors as in the macro analyses above. As a result of the relatively small insider effects on regional wage formation, this is probably not a major weakness.

3.3. Analyses of central and local wage settlements in manufacturing industries

As pointed out in section 2 wage growth in manufacturing industries may be divided into central wage increases and wage drift. The development in these two components with particular emphasis on wage drift has been analysed among others Holden (1989), Bowitz (1989) and Bruce (1989). Both Bowitz and Bruce found that product prices and productivity might be important factors determining wage drift. Although it has been difficult to get any significant partial effects from changes in pay-roll taxes, assumptions about symmetry may indicate that pay-roll taxes have an effect on wage drift in about the same way as output prices and productivity. The results in Holden (1989) indicate that wage drift may depend negatively on the size of inventories and positively of the rate of vacancies. These factors also indicate that wage drift fluctuates over the business cycle.

3.4. Analyses of wage growth outside manufacturing

Wage growth in Norwegian sectors outside manufacturing is among others analysed by Eitheim and Nymoen (1991), Langørgen (1993) and Stølen (1995). A common result is that wages in these sectors are highly dependent on manufacturing wages according to the Scandinavian theory of inflation. The concern for real disposable incomes is also found to have some effect. Except from short term effects in few sectors reported by Stølen (1995) changes in pay-roll taxes seem to be of no direct importance for wage formation outside manufacturing. An increase in pay-roll taxes may then be passed over into output prices in the private services in the short run. As wages outside manufacturing after some time are influenced by manufacturing wages, higher pay-roll taxes may indirectly lead to lower wages. As

the concern for disposable income also seems to be of some importance, the employees in these sectors do not carry the whole burden, and a part of the pay-roll taxes is thus passed over into higher prices also in the long run.

4. Conclusions

- The effect on wage formation in Norwegian manufacturing industries from changes in pay-roll taxes is not precisely determined in any empirical analysis.
- Most of the empirical analyses indicate that a large part of changes in pay-roll taxes is shifted over to wages in the long run at the national level. This is in accordance with the Scandinavian theory of inflation and a rather non-elastic supply curve for labour towards manufacturing. A pass over effect of about 70 to 80 per cent in the long run may be a reasonable estimate.
- All empirical analyses indicate that a reduction in pay-roll taxes may reduce wage costs in the short run and thus has a positive effect on employment.
- Because of symmetry a shift in the composition of taxes may have only small effects on wage costs and employment in the long run.
- As a result of slow adjustments a shift from pay-roll to income taxes may be beneficial for wage costs and employment in the short run.
- A partial reduction in pay-roll taxes has a positive effect on employment, partly because of lower labour costs in the short run, and probably some effects also in the long run, and partly because the resulting wage increases stimulate private consumption.
- A favourable geographical differentiation of pay-roll taxes for the rural areas has obviously been beneficial for employment in these areas as less than 20 per cent of the reduction is passed over into higher wages in a single region.
- Although the empirical results are inconclusive, changes in pay-roll taxes may affect wage drift in manufacturing sectors more than the central wage settlements.
- Changes in pay-roll taxes are found to have only minor direct effects on wages in the sheltered sectors, but indirectly these wages are affected by changes in manufacturing wages.
- Changes in pay-roll taxes may be passed over to prices in private sheltered sectors in the short run, but also somewhat in the long run.

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