**FIEF Working Paper Series 2000** ISSN 1651-0852

No. 160

# Taxes, Risk Aversion and Unemployment Insurance as Causes of Wage Rigidity*

by

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## Abstract

Recent empirical evidence has shown that nominal wages are more rigid among blue-collar (low income) workers than among white-collar (high income) workers. We show theoretically that employees in crisis-ridden firms will reject wage cut proposals that save jobs if risk aversion is great, replacement rates high and marginal taxes low. These factors for can explain why wage rigidity is less intense among high-income earners than among low-income earners. We argue, that with economic growth nominal wages should become more flexible, since marginal taxes increase, the marginal utility of income drops, normally, replacement rates fall.

**Keywords:** Wage rigidity; Marginal taxes; Risk aversion; Unemployment insurance.

**JEL classification:** J30; J65; H2

**April 27, 2000**

* I have benefited from comments made by seminar participants at FIEF, in particular Hans Sacklén, Joakim Persson, Tomas Sjögren and Johnny Zetterberg.

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# 1. Introduction

The reasons for nominal wage rigidity have fascinated economists for a long time. Yet despite the long-standing interest, no generally accepted explanations have been found. In the US, most empirical research has used time series data to see whether wage rigidity differs between periods of extended labor market legislation and periods of liberalization.[1] Studies on the European economies have mainly dealt with the role of bargaining institutions, unionization, etc.,[2] where such issues as multi-level bargaining, length of contract, contract synchronization, and the general design of contracts are in focus.

While such institutional issues may be of great importance to the rigidity of negotiated wages, one cannot disregard employees' inherent resistance to wage cuts. Indeed, since proposals to cut wages are likely to occur when a firm is in deep crisis, understanding the individual worker's attitudes should be imperative for any possibility of cutting wages.

In recent years, a number of survey studies have shed light on the reasons for downward wage rigidity among employees in individual firms.[3] Several of these studies show a deeply rooted resistance towards wage cuts among the employees. A case in point is Campbell and Kamlani (1997), who presented the following question to the U.S. firms in their study (p. 783):

"Suppose the economy were in a recession and you gave your workers the following choice: A. a 10% wage cut, B. a 10% chance of losing their jobs and a 90% chance of remaining with your firm with no pay cut. Which do you think most of your employees would choose?"

Campbell and Kamlani found that a sizable number of respondents view their workers as preferring employment cuts to wage cuts. Around 40 per cent claimed that their employees would rather accept the risk of losing their jobs, another 40 per cent claimed employees would choose the wage cut, while the remaining respondents were uncertain. Other studies that more directly measure the extent of wage cut resistance in crisis are Agell and Lundborg (1995, 1999), in which wage rigidity in

[1] See for instance O'Brien (1989), Mitchell (1985) and Hanes (1993).
[2] See for instance Holden (1994).
[3] These include among others Blinder and Choi (1990), Agell and Lundborg (1995), Campbell and Kamlani (1997), and Bewley (1995, 1999).

Swedish manufacturing firms is evaluated. Personnel managers were presented with the following question on two different occasions:

"*Assume that the management in the midst of an acute crisis suggests an identical percentage wage cut for all employees in your firm, so that the wage hierarchy is retained. What share of the jobs do you believe must be at stake if the proposed cut is to be accepted*?" [4]

The responses were highly consistent. The subjectively perceived wage rigidity was intense in both years and was thus unaffected by the drastic macroeconomic changes that had taken place between the two surveys of 1991 and 1998. A clear majority of the firms' personnel managers, 80% in 1991 and 76% in 1998, answered that more than 50% of the jobs must be at stake in order for the employees to accept a wage cut.

Another finding is that in firms with a larger share of white-collar workers, the resistance to cut wages is perceived to be less intense. The share of white-collar workers has a significantly negative effect on the subjectively perceived wage cut resistance among firms. This result appears robust as it survives when other variables are added, such as industry dummies, firm size and the unionization rate.[5] The study by Campbell and Kamlani finds a similar structure in their "non-Business Week" sample in which large firms are somewhat underrepresented. While no statistical significance tests are reported, firms in this sample claim that 50.8 per cent of white-collar workers would opt for the wage cut while only 44.1 per cent of blue-collar workers and 44.9 per cent of less skilled workers would choose a wage reduction.[6]

This paper focuses on possible reasons why blue-collar workers tend to be less willing than white-collar workers to accept wage cut proposals. Unless attitudes of solidarity with the owners of the firm in crisis differ between the two groups of workers, which cannot be ruled out, the distinguishing background factor is the income differences between blue- and white-collar workers. With these income differences in mind, we show that the downward wage rigidity emanating from the individual employees themselves can be explained by several factors. For instance, the findings that wage cut resistance is intense among blue-collar work-

[4] The wage cut was assumed to be proportional since it was found in the study that employees care a great deal about relative wages. The relative wage effects were neutralized by the condition that the wage hierarchy is retained.

[5] See Agell and Lundborg (1999) for more details.

[6] In their "Business Week" sample, dominated by large firms, no major differences seem to exist between the groups of workers.

ers and that white-collar workers are less reluctant to wage cuts is consistent with the higher marginal taxes levied on high-income earners. Moreover, it also follows from an assumption of risk avert agents. Finally, in our model a higher replacement rate among blue-collar workers is also a possible determinant of differences in wage cut resistance.

# 2. Wage rigidity in firms in crisis

In no situation is the importance of wage rigidity so great as when a firm is in a crisis. Our point of departure is the type of question posed to personnel managers in the studies by Campbell & Kamlani and Agell & Lundborg, cited above. Imagine a crisis situation in a firm and that management calls for a meeting with their employees. They present the employees with the following alternatives*:*

*Either you agree to lower your wages collectively by* $a$ *per cent, or a share* $P$*, determined from a random draw, has to leave the firm.*

We assume that the union offers their members exact background information and that there therefore is no uncertainty in the model.[7]

Let us then assume that utility is a function $u(...)$ of the income that the workers may have in different states and that this function is common to all workers. Wages are denoted by $w^v$ for white-collar workers and $w^b$ for blue-collar workers. The replacement rate is $b$. The white-collar worker's tax rate is $t^v$ if employed, the minimum rate of $t$ if unemployed, and $t^{va}$ if the wage cut is accepted. The blue-collar worker's tax rate is $t$ in any state. We thus have $t^v > t^{na} > t$.

Consider now the decision rule for a representative white-collar worker. This worker does not agree to the wage cut if

$$(1-\Pi)u(w^v(1-t^v))+\Pi u(b^v w^v(1-t))-u(w^v(1-a)(1-t^{va}))>0, \qquad (1)$$

else the worker agrees. The first two terms represent the situation where the individual refuses a wage cut. With probability $(1-\Pi)$ the worker

[7] The assumption of a random draw is not realistic for all countries. In many countries there are strict rules concerning which workers should be laid off first.

stays employed at wage $w^v$ and receives the net-of-tax wage $w^v(1-t^v)$. With probability $\Pi$ the worker becomes unemployed and ends up with the net-of-tax income level $b^v w^v(1-t)$. The third term represents the utility level reached if the worker agrees to the proportional wage cut $a$, where a net-of-tax income of $w^v(1-a)(1-t^{va})$ is offered. Only if this last term is larger than the sum of the first two, i.e. if the utility of accepting the wage cut is higher than the expected utility of refusing the wage cut, will the employee agree to a wage cut and hence exert downward wage flexibility.

Some minor insights follow immediately by checking the consistency of (1). Assume that the firm asks for a wage cut but claims that no jobs are threatened, i.e. $a > 0, \Pi = 0$. The second term vanishes. Equation (1) is always positive, i.e. no worker agrees to a wage cut, as expected.

Secondly, if management announces that every job will be lost, i.e. $\Pi = 1$, everyone will agree, *unless* the suggested wage adjustment $(1-a)(1-t^{va})$ is so large that the new wage is below the tax adjusted replacement rate when unemployed $b^v(1-t)$.

We can now define wage cut resistance as the positive surplus in (1).[8] If (1) is negative, no resistance exists. While it is more realistic to assume that resistance is some function of this surplus, no generality is lost, but simplicity is gained if we assume that wage cut resistance is a linear function of the surplus. We see that resistance increases with the replacement rate; i.e. for a given unemployment risk, a higher reservation wage as unemployed yields a larger resistance to wage cuts.

The corresponding decision rule for blue-collar workers is the following: disagree to cut wages if

$$(1-\Pi)u(w^b(1-t)) + \Pi u(b^b w^b(1-t)) - u(w^b(1-a)(1-t)) > 0, \qquad (2)$$

else agree. Note that we have assumed an identical tax rate in any state for blue-collar workers and that they have lower incomes than white-collar workers, i.e. $w^v > w^b$. In general, and in line with empirical calculations, we also assume that $b^v < b^b$, i.e. that the replacement rate is

[8] Note that in Agell and Lundborg (1995), the resistance to cut wages is measured by the parameter $\Pi$, i.e. by the share of jobs at stake for any given (and undefined) wage cut, $a$. In Campbell and Kamlani (1997), resistance is (implicitly) expressed as share of workers that would agree to a 10 per cent wage cut given an unemployment risk of 10 per cent. We measure the surplus in (1) and (2) respectively for a specified unemployment risk $\Pi$ and a specified wage cut $a$. The structure of the problem is identical in all three cases.

higher for blue-collar workers.[9] Note also that the proposed wage cut is the same for the two groups of workers as is the unemployment risk.

# 3. Who resists the wage cut proposal the most?

## *a. Utility functions*

The question now is, who will resist the wage cut the most, the white-collar worker or the blue-collar worker? Basically, since only incomes differ across the two groups of workers, this question amounts to asking how much wage rigidity depends on income levels. We can shed light on this issue by simply comparing equations (2) and (1).

However, a simple comment is first in order. We have assumed that if the surpluses of (1) and (2) are identical, wage rigidity will also be identical. It could be argued, though, that even if the surpluses are identical, one of the groups, presumably the white-collar group, might be more willing to accept a wage cut if, for instance, they care more about the firm's survival. Many white-collar workers have career jobs and more often than blue-collar workers invest in firm-specific skills This might suggest more sympathy in this group for the owners of the firm. Such effects could easily be captured by constants in (1) and (2) that represent the degree of commitment to the firm's objectives. Though this is a trivial extension that adds little to the analysis, it should not be ignored as a possibility.

To add more realism we need to specify the utility function. We assume a popular utility function that exhibits decreasing absolute risk aversion and constant relative risk aversion and has the following shape:

$$u = \frac{1 - y^{1-a}}{a - 1} \tag{3}$$

where $a \geq 0$ is a constant. If consumption equals income, $y$, $-a$ expresses the elasticity of marginal utility and the inverse $1/a$ measures the elasticity of substitution between consumption at any two income levels. $y$ could be any of the income measures in (1) and (2), i.e. the net-

[9] See Ministry of Finance (1997).

of-tax incomes in employment or unemployment. In (3), absolute risk aversion equals $a/y$ and relative risk aversion equals $a$.[10]

Since we cannot assume that the firm proposes an infinitesimal wage cut, we must analyze non-marginal changes in the proposed wage cut. By assumption, the wage cut is also proportional for all workers. Hence, we cannot deduce any analytical results by a differential calculus and instead we proceed by using computer simulations. We therefore use equation (3) in (1) and (2), determine parameter values and calculate how the differences in wage cut resistance among the two groups of workers change when we make changes in taxes, replacement rates, etc.

We have already established that with linear utility, identical parameters and higher wages, white-collar workers will resist the wage cut more than blue-collar workers. This is in contrast to the empirical results reported above. We shall now see under what conditions the contrary result may be established, i.e. that blue-collar workers resist the proposed cut more. Let us then do the following experiment: begin with a situation in which white-collar workers resist the cut more and make some simple parameter changes to see if the result occurs that blue-collar workers resist the cut more.

## b. *Replacement rates*

In all simulations in the rest of the paper we assume that $w^b$=100 and $w^v$=150, i.e. that white-collar workers' wages are 50% higher than those of blue-collar workers, that $a$ = .025, i.e. the proposed wage cut is 2.5 per cent, and that $\Pi$ = .1, i.e. 10 per cent of the work force must leave unless the proposed wage cut is accepted. Ten per cent was the unemployment risk in the question asked by Campbell and Kamlani and cited in the introduction.

Taxes differ across states: If employed at $w^v$, the white-collar worker pays a tax $t^v$=40 per cent, and when employed at the *ex post* cut wage level, a tax of $t^{va}$ =39.8 per cent. Since this rate is lower, a progressive tax system is implicit. Finally, a basic tax rate of 30 per cent applies when the white-collar worker is unemployed and this rate also applies to the blue-collar workers in any state, i.e. $t$=.30. We assume that $a^v$=.70 and that $a^b$=.50. This implies that the marginal utility of income is lower for white-collar workers (=.03) than for blue-collar workers (=.1).

[10] Arrow (1964) and Pratt (1964) defined absolute risk aversion as $-u''(y)/u'(y)$ and relative risk aversion as $-yu''(y)/u'(y)$.

***Table 1. If blue-collar workers have a higher replacement rate than white-collar workers they may resist wage cuts more.***

| | White-collar workers' wage cut resistance | Blue-collar workers' wage cut resistance | Net wage cut resistance |
|---|---|---|---|
| $b^v = b^b = .79$ | .0534 | .0244 | .0290 |
| $b^v = .72, b^b = .79$ | .0190 | .0244 | -.0054 |

In the benchmark simulation reported in Table 1, both white-collar and blue-collar workers have identical replacement rates of 79 per cent, i.e. $b^v = b^b =$ .79. We see that in this simulation, the white-collar workers are more reluctant to cut wages since there is a net wage resistance of .0290 (=.0535-.0244).

Obviously, given the assumed parameters, management would have to suggest a more modest wage cut for workers to agree. A ten per cent wage cut would make both groups of workers agree, though this need not be enough to save all jobs.

Now, let us assume that the replacement rates differ between the two groups of workers. Ministry of Finance (1997) showed that the replacement rate was 79 per cent for blue-collar workers and 72 per cent for white-collar workers.[11] The bottom line of Table 1 shows that resistance to wage cuts is now greater among the blue-collar workers, since the net resistance is negative. Thus, a lower replacement rate for white-collar workers could potentially explain the empirical finding that white-collar workers find it easier to accept a proposed cut in wages.

Crucial for the relevance of this argument is the expected duration of unemployment. In Sweden, the expected duration of unemployment was around 17 weeks[12] during the crisis of the early 1990:s when Agell and Lundborg (1995) conducted their survey. An individual rejecting the wage cut proposal would then find that expected *annual* incomes are not much affected by the level of the replacement rate. If the worker expects to be unemployed for only 17 weeks, i.e. somewhat more than a third of a year, the difference in annual incomes for both white- and blue-collar workers who lose their jobs is much less than that in Table 1 (72% and

[11] These calculations hold for 1997.The gross replacement rate was then 80% while in 1991, when Agell and Lundborg performed their survey, the rate was 90%. This suggests that in 1991, the net replacement rate could have been correspondingly higher for both groups of workers. It should also be noted that in the calculation of the net replacement rates, differences in marginal taxes have been accounted for.

[12] See Zetterberg (1999).

79%). Annual incomes for blue-collar workers who become unemployed for such a period then drop to 92 per cent of a full employment income, while for white-collar workers the income drop is to around 90 per cent. Such small differences can hardly account for all of the recorded differences in wage cut resistance among blue- and white-collar workers.

It is possible to give some indication of in which OECD-countries the replacement rates affect wage flexibility the most. To shed light on this issue, we report net replacement rates (NRR) and unemployment duration for the OECD countries. The NRR varies widely across countries. Martin (1996) has calculated the 1994/95 NRR for seventeen OECD countries and for different duration categories and family conditions.These are shown in Table 4, column 2 (see Appendix). The calculations not only include unemployment benefits but also consider taxes on benefits.

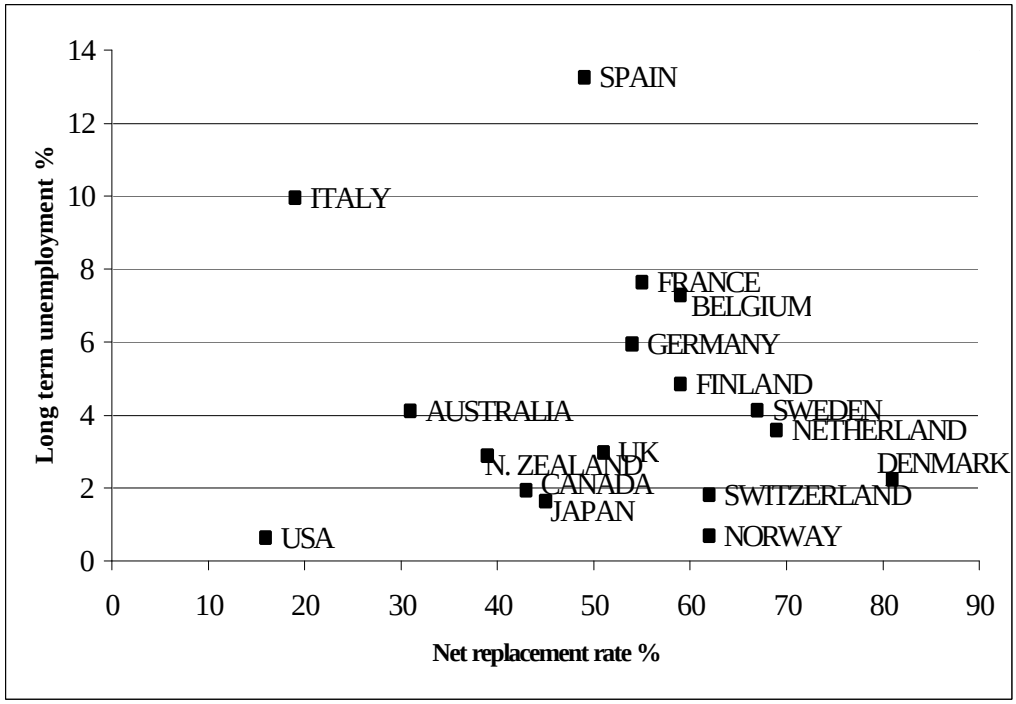
As noted, the argument that the NRR affects downward wage flexibility is relevant only to the extent that unemployment is of a long-term character, i.e. that the expected unemployment is of extended duration. We have therefore calculated the number of long-term unemployed as a share of the labor force and show these in Table 4, column 3. The larger this share, the more the NRR should matter for wage flexibility. We calculate NRR for those unemployed over 6 months, the implicit assumption being that if the individual is unemployed for 6 months or more, the replacement rate is of concern for wage cut resistance. Unemployment rates reported are for 1998.

In Figure 1, below, we have plotted the long-term unemployment rate against the net replacement rate. Countries situated in the upper right corner are worst off in terms of wage flexibility, while in the countries situated in the lower left corner wage flexibility would not be hampered by unemployment insurance.

Our data and the analysis above suggest that of these countries the United States is the one where the replacement rate should matter the least for wage rigidity. Not only is its NRR the lowest, the US also has the lowest long-term unemployment rate. Also Canada, Japan, New Zealand and Australia combine relatively low long-term unemployment rates with relatively low replacement rates.

Things look worst for Spain – a country that combines a very high risk for long-term unemployment with a relatively high net replacement rate. France, Belgium, Germany, Sweden, Finland and the Netherlands are other countries that rank relatively high either in terms of NRR, long-term unemployment or both.

***Figure 1. Net replacement rates and long-term unemployment in seventeen OECD countries.***




## *c. The tax system*

In the second experiment we analyze the effects of marginal tax changes. As in our previous simulations, we assume some risk aversion. In the benchmark simulation reported in the first row of Table 2, we assume that the white-collar workers pay an average tax of 40 per cent and that this is reduced to 39.8 per cent after the proposed wage cut is accepted. For those unemployed the tax rate is 30 per cent, while the blue-collar worker is assumed to pay 30 per cent taxes in any state. The benchmark solution here is identical to the benchmark solution in Table 1.

In the alternative simulation, in case of a wage cut we reduce the tax rate to 39.0 per cent instead of 39.8 per cent, taking marginal tax to be higher than was assumed in the benchmark simulation. We raise the marginal tax rate from 48 per cent to 79 per cent, a rate that was not uncommon before the Swedish tax reform completed by 1992.

***Table 2. If marginal taxes on high incomes increase enough, white-collar workers will show less resistance to wage cuts than blue-collar workers.***

| | White-collar workers' wage cut resistance | Blue-collar workers' wage cut resistance | Net wage cut resistance |
|---|---|---|---|
| $t^v$ =.40 $t^{va}$ = .398<br>$t$ =.30 | .0534 | .0244 | .0290 |
| $t^v$ =.40 $t^{va}$ =.390<br>$t$ =.30 | .0028 | .0244 | -.0217 |

We see that in the benchmark simulation, white-collar workers stand to lose more from accepting a wage cut than blue-collar workers. However, with a higher marginal tax rate, as assumed in the second simulation of Table 2, the situation is reversed. White-collar workers now stand to lose less from accepting the wage cut proposal than blue-collar workers. The intuition is quite clear. When marginal taxes are high, high-income earners who stand to lose more from a wage cut under proportional taxes will get a "rebate" in terms of lower taxes after they have accepted the wage cut proposal. In the ultimate case of 100 per cent marginal taxes, workers would be indifferent to the choice of accepting or rejecting a wage cut proposal.

Marginal tax rates differ a great deal across the OECD area. In 1997 the marginal tax on the average production worker's earnings exceeded 60 per cent in Belgium, New Zealand, Hungary and Finland. Another seven countries have marginal tax rates above 50 per cent: Italy, Germany, the United States, Canada, Iceland and Sweden.[13] These are therefore the countries that might be expected to have the highest downward wage flexibility based on the tax argument. In Japan and Luxembourg, the marginal tax rate is slightly above 20 per cent and in Korea only around 14 per cent. In these countries wages should therefore be expected to be more rigid since, *ceteris paribus*, workers have little incentives to agree to a downward wage adjustment. The result also implies that tax reforms that drastically reduce marginal tax rates, like the

[13] See OECD (1998). The calculations are based on employees' and employers' social security contributions and personal income tax for a one-earner family with two children whose wage level represents 100 percent of an average production worker.

one in Sweden in 1990/91, should have increased downward wage rigidity, notably among high-income earners.

The tax argument is akin in spirit to the results of Lockwood and Manning (1993), whose main result is that an increase in the marginal income tax rate reduces the pre-tax wage. Their analysis thus suggests that a tax system designed to reduce wage pressure and lower unemployment should be strongly progressive, with a marginal tax considerably higher than the average tax rate. We find that a strongly progressive tax system also tends to raise wage flexibility and make employees more receptive to wage cut proposals in a situation of crisis.

It should be noted that the Lockwood-Manning study deals with firm-union wage bargaining. Similar results have been obtained with monopoly union models, as in Malcolmson and Sator (1987). Unlike these models, we have studied a crisis situation in a single firm, but shown that the rational reactions among employees imply a related result, which is that higher progressivity tends to reduce downward wage rigidity. Like Malcolmson and Sator and Lockwood and Manning we also find empirical support since the results in Agell and Lundborg (1999) are in line with the fact that white-collar workers pay higher marginal taxes than blue-collar workers.

## *d. Risk aversion*

Finally we come to analyze the effects of risk aversion. Our assumed utility function exhibits decreasing absolute risk aversion once we assume that the parameter $a$ is positive. We also assume that not only the wage cut proposal and the unemployment risk, but also the replacement rate and tax rates are identical across the two groups of workers. Whether the surplus in (1) is greater or smaller than the surplus in (2) then depends on the shape of the utility function. If $u(...)$ is linear, the surplus is larger for the white-collar workers since they stand to lose more. Losing, say, five per cent of a high wage then implies a greater utility loss than losing five per cent of a low wage.

To evaluate this argument we raise the risk aversion parameter $a$. We assume that in the benchmark simulation we have $a^v = .50$ and $a^b = .70$, while in the next simulation, somewhat arbitrarily, we assume $a^v = .90$ while $a^b$ is unchanged. The marginal utility of income equals $y^{-a}$ and a higher value of $a$ then implies a lower marginal utility. With this assumption, the marginal utility of white-collar workers drops from .03 to .01. We present the results of this exercise in Table 3.

***Table 3. Risk aversion implies that blue-collar workers will resist a wage cut proposal more than white-collar workers.***

| | White-collar workers' wage cut resistance | Blue-collar workers' wage cut resistance | Net wage cut resistance |
|---|---|---|---|
| $a^v = .70, a^b = .50$ | .534 | .0244 | .0290 |
| $a^v = .90, a^b = .50$ | .0217 | .0244 | -.0027 |

Under the assumed parameter values we find that with white-collar workers being more risk avert, they will resist the wage cut proposal less than blue-collar workers. The intuition is clear: a reduction of everyone's wage by $\alpha$ per cent means a greater drop in utility for blue-collar workers than for white-collar workers since the marginal utility of white-collar workers is less than that of blue-collar workers.

We have no simple means of evaluating the relative importance of the arguments we have mentioned. While replacement rates as well as marginal tax rates are parts of the tools of government policy, the shape of the utility function is not. To the extent that necessary wage cuts are rejected on account of high marginal utilities, wage rigidity cannot easily be remedied. Moreover, in determining replacement rates and marginal taxes, many other considerations than wage rigidity must of course be accounted for.

# 4. Conclusions

The issue of nominal wage rigidity has become increasingly important with the emergence of a common currency in the EU. One of the main reasons why some countries hesitate to join the EMU is the lack of downwardly flexible wages in case of an asymmetric shock. Wage flexibility at the micro level is often even put forward as crucial to the success of the EMU project. While most studies have focused on the reasons for wage rigidity in bargaining settings, the purpose here is to understand why employees in firms in crisis reject wage cuts despite the large risks they run of losing their jobs.

We have analyzed the conditions under which the empirical finding obtains that blue-collar (low-income) workers resist wage cut proposals

more than white-collar (high-income) workers. Differences in replacement rates are one condition, an argument that hinges crucially on the general macroeconomic situation. In the case of an idiosyncratic adverse shock to a single firm in a full employment economy, the individual worker can expect to be back in employment after a short period of unemployment. Clearly, the effect of high replacement rates on downward wage flexibility is then low.

But the argument might be highly relevant in case the general unemployment level is high and the expected unemployment duration very long. Generous replacement rates are thus likely to have a more adverse effect on wage flexibility in deep and prolonged recessions when flexibility is needed the most. If in periods of persistent unemployment a large number of firms suggest wage cuts to avoid staff reductions, the level of the replacement rate could play an important role, in particular if the risk of long-term unemployment is high. The negative effects are of course counteracted if unemployment insurance is limited in duration as indeed is the case in many countries.

Reductions of tax progressivity are likely to have negative effects on downward wage flexibility. If large sections of the population face marginal tax rates of 70-80%, as for instance in Sweden during the 1980s, wage cuts can more easily be borne by high-income employees. In the present post-reform situation with marginal tax rates of 30-55 per cent, these employees stand to lose considerably more from accepting a wage cut.

Differences in marginal utilities should also matter. It is quite imaginable that a five per cent wage reduction, say, can be accepted more easily by the well-paid civil engineer than the low-paid textile worker whose margins with regard to the necessities of life are small. But how much marginal utilities differ empirically is very difficult to determine.

The analysis suggests that as an economy grows, wages should become increasingly flexible. There are three reasons for this. First, for any given progressive tax system, higher wages imply that more workers pay higher marginal taxes, which makes it easier to accept wage cuts in a crisis. Secondly, the marginal utility of income is also likely to fall and a given wage cut proposal then becomes easier to bear. Finally if, as in many countries, there is a maximum unemployment benefit, the actual replacement rate drops as income grows. These three theoretical arguments, which are in line with the empirical finding reported in the introduction, support the conclusion that wage flexibility should rise in expanding economies.

Finally, it should be remembered that in studying workers' attitudes to wage rigidity we have largely excluded trade union involvement. But while the firm might present the workers directly with a wage cut proposal, as assumed here, the local union would nevertheless react if an agreement to cut nominal wages goes against the collective agreement. If industry level bargaining has defined a wage floor that must not be undercut, wage reduction may not come about even if the individual workers should agree to cut the wage.

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# Appendix

***Table 4. Net replacement rates (NRR) and long-term unemployment in 17 OECD countries. Rankings in parentheses.***

| Country | NRR(rank). 1994/95 | Long term-Unemploy-ment rate. (rank) 1998 |
|---|---|---|
| **Austalia** | 31(3) | 4,12(10) |
| **Belgium** | 59(11) | 7,28(13) |
| **Canada** | 43(5) | 1,94(5) |
| **Denmark** | 81(17) | 2,23(6) |
| **Finland** | 59(11) | 4,85(12) |
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