

# THE FINNISH EMU BUFFERS AND THE LABOUR MARKET UNDER ASYMMETRIC SHOCKS\*

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## **Abstract:**

The Finnish EMU buffers consist of new elements built into the social security system, i.e., the reform of the unemployment insurance system and the transformation of the equalisation reserve of the work pension system to be of a partially funded character. The goal is to maintain the social security contributions of employers during a possible recession in the EMU age steady compared to the PAYG system. The paper simulates the role of the buffers in a hypothetical recession caused by an adverse asymmetric shock, and finds that, from the point of view of stabilising employment, their role is quite modest, but that more sizeable effects are felt in company profitability. The buffers, on the other hand, are likely to entail behaviour of the moral hazard kind, as they reduce real wage adjustment in the economy. As a last issue, the policy problem, how to manage a recession, whether to cut indirect labour costs by the employers, or raise effective demand through increased social security benefits, is addressed.

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## 1. Introduction

In the early 1990s, the Finnish economy came across a most difficult economic depression. The unemployment rate skyrocketed to almost 18 per cent in a few years while being only 3 per cent before the shock. This placed hard pressure also on the labour market to adjust. The nominal wages were constrained to rise by very little, but as the pace of inflation also decelerated, the real wage adjustment was quite limited indeed in comparison to the magnitude of the series of adverse shocks.

At the same time, in the wake of the political upheaval in Europe, Finland started to negotiate on its membership in the EU, leading to accession in 1995. The membership required the adoption of the Maastricht Treaty as such, including also that of EMU. As the integration strategy of Finland is to be an active member of the Union, the government started a determinate adjustment of the economy to meet the convergence criteria as set in the Treaty. The economy turned onto a sustainable and vigorous growth path, spurred in part by the successful EMU adjustment conducive to a marked reduction in the interest rates, being at a record-high level in the crisis years of the early 1990s.

One essential fear in the country, which has had a long lasting tradition of sizeable and frequent devaluations to improve the weakened competitive situation, was the difficulty to live under the hard constraint of an irrevocably fixed exchange rate vis-à-vis the main export market. So, in the preparations of an EMU membership and in studies on it carried out by the research community, the asymmetric shocks were raised as the main risk of joining the single currency. The just-ended recession was a clear reminder of their existence. Accordingly, there were frequent voices by industry leaders that if and as Finland were to join EMU, there should be more flexibility in the labour market so that firms could manage to survive through possible recessionary periods in the new environment.

The trade unions considered these loud voices as a threat. Instead, they suggested and demanded that special funds be collected, so that the adjustment could be softened in case of possible recession. The idea behind the funds was two-fold. Firstly, the pressure put on employers to cut employment in bad times would be mitigated and, sec-

only, the pressure placed in such times on labour to adjust through wage cuts would be eliminated, or at least reduced. The central organisations of the social partners started to negotiate on the funds, which were called EMU buffer funds in publicity, and in November 1997 they reached a solution on them. The basic idea is to transform the social security system, i.e., the pension system and the unemployment insurance (UI) system, to include elements of a partially funded character, so that the former handicaps related to the features of the pay-as-you-go system could be avoided.<sup>1</sup>

The main aim of these buffers is to preserve the social security contribution rate by the employers as steady as possible and to prevent the perverse situation, which emerged in the early 1990s, when the UI contribution rate had to be raised ten-fold, as the revenues of the UI system dwindled and the outlays skyrocketed. This led to a vicious circle, as the rises in costs in part led to a weakening in employment, and again to a higher need to raise revenues, and so on.

The greatest change will be made in the unemployment insurance (UI) system, see e.g. Holm and Mäkinen (1998). The goal is to collect an Unemployment Insurance Fund by 2002-2004, the capital of which is currently FIM 3.5 billion (EUR 0.6 Billion, 1.7 per cent of the private sector annual wage sum). This is estimated to be a buffer, big enough to manage a "normal" recession in the manner to be explained below. The Fund can also borrow to meet its obligations. Also within the work pension system, within the so-called Equalisation Reserve, a buffer which 2.2 per cent of the wage sum, currently FIM 4.7 Billion, will be formed.<sup>2,3</sup>

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<sup>1</sup> The private work pension system has traditionally been partially funded and so the change in the system concerned only one component of it, the Equalisation Reserve. The social partners also discussed using intra-firm adjustment mechanisms, like personnel funds and profit sharing (see in general on them Alho, 1998), but without reaching a solution on them, as the employers insist them to be internal affairs of the firms solely.

<sup>2</sup> These arrangements only concern the private sector, the public sector being outside of them.

<sup>3</sup> In the bill accepted by the Parliament in 1998, there is stipulated an upper boundary for the Unemployment Insurance Fund, which corresponds to annual unemployment benefit expenses, related to unemployment of the magnitude of 3.6 per cent, and a lower boundary as the opposite number of this. These figures correspond to the agreement on the size of the buffers by the social partners. When the capital of the Fund lies within these boundaries, the UI contribution is not raised, but the capital of the Fund is used to match the possible current deficit of the Fund. If the rate unemployment increases so that the lower boundary imposed on the capital of the Fund is threatened to be broken, the UI contribution will be raised so much that the Fund is not anymore in deficit. So, we can infer that the new UI system is in fact a limited cyclical buffer.

Another possibility is to use the funds to actively stabilise the economy, i.e., lower the social security contribution in a recession and raise them again in a boom. This activist tone is not mentioned in the agreement by the social partners on the funds, but it is not excluded, either. One problem with such an effort is – as in all countercyclical economic policies – that the measures do not necessarily have a proper timing. In case of deep recessions and depressions, the potential of the buffers will soon be exhausted and their size does not reach long. Their main role is to give time to plan and carry out more fundamental adjustment measures and to prevent the fact that the situation starts already from the outset to develop into a perverse direction, as was the case in the early 1990s crisis. Such changes have earlier been carried out in the work pension system. In the recession in the late 1970s, when the work pension contribution rate by the employers was lowered by 2 percentage points in 1978, and again in the most recent crisis in 1992 by 1.5 percentage points. The contribution rate was restored almost to the pre-crisis level in 1996.

The aim of this paper is to analyse the working of the labour market and the social security system under EMU from three angles. Firstly, the working and performance of the buffer funds is simulated under a hypothetical recession with respect to employment and firm profitability and compared to the pay-as-you-go system of social security. Secondly, the reaction of the labour unions with respect to wage adjustment is analysed and it is discussed, whether this reaction is influenced by the existence of the buffers. As an insurance system in general, the EMU buffers can also be expected to include a tendency toward moral hazard, which in this case would mean that the magnitude of real wage adjustment is reduced by the creation of them. And thirdly, the paper analyses what kind of policies should in general be pursued in the case of a recession in EMU, whether to cut the indirect labour costs of the employers in order to enhance their ability to employ, or to maintain social security benefits channelled to the unemployed and thereby ensure their ability to consume and maintain demand for the domestic production.

In this way, we try to present an overall analysis of the adjustment of the economy in case of an asymmetric shock in EMU, one element of it being the EMU buffer funds, a Finnish speciality, which have raised also international interest in other EU countries.

## 2. The buffers from the point of view of employment in a hypothetical recession in the EMU age

From the point of view of the macro economy, the key importance of the buffers is that the path of the social security contribution rate is in principle more stable than if the current expenses and revenues have to be kept continuously in balance in the alternative, the PAYG system. Or, stated in another way, there is less pressure to cut social security benefits in a recession (see on this Section 4).

Holm and Mäkinen (1998) have evaluated the change in the Finnish UI system after the EMU buffer agreement by the social partners and the operation of the new system in the EMU environment. Any behavioural assumptions like those between the labour costs and social security contributions and those between wages and employment were not included in their analysis, so that it was merely a technical, but, on the other hand, a very detailed calculation on how the system could work in a recession. The starting point is a hypothetical recession where the number of unemployed rises from the initial situation by 40 000 persons in a year, so that it is after two years 80 000 persons, around 3.5 percentage points, higher than without the shock. After this the rate of unemployment returns to its initial level at the same speed.

The detailed calculation by the authors gave the result that this kind of development leads to a need to raise the UI contribution rate by one percentage point in relation to the wage rate. This can be prevented with a funded UI system, where the capital is allowed to vary within a range of FIM 6 Billion (EUR 1 Bill.). This would mean an annual reduction of 0.5 percentage points in the UI contribution rate in comparison to a PAYG UI system.

Let us now take as our goal to compare the performance of the various social security systems, old and new, in a hypothetical asymmetric shock in EMU, allowing for the key behavioural relationships of the labour market.<sup>4</sup> The situation is illustrated in Figure 1. Imagine that at time  $t_0$  the economy and the social security system, by which is now basically meant the unemployment insurance (UI) system, are in balance so that the size  $R$  of the capital of the buffer fund is equal to its upper ceiling, denoted by  $R_Y$ ,

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<sup>4</sup> On the working of the buffers, see also Holm et al. (1999).

e.g., FIM 3 billion. The unemployment insurance contribution rate is denoted by  $m$  and it is initially on a level, which maintains the fund at this level, i.e., the current expenses and receipts just balance each other.

Let us further assume that at the same point in time,  $t_0$ , the economy, for some reason or another, slides into a recession, which turns out to be quite a severe depression. The rate of unemployment, denoted by  $U$ , starts to rise. Under the EMU buffer fund system the social security contribution rate  $m$  is not raised but maintained at the initial level. The rising unemployment leads to a loss of revenues and a rise in expenditure of the UI system so that the capital of the fund declines until at point  $t_1$  it hits the lower boundary, which we denote by  $R_A$  (see footnote 3 above). The hypothetical recession is, however, so bad that unemployment rises further. But as the EMU buffer is a limited buffer, from this point in time onwards it has to be treated as a PAYG system. This means an upward jump in the contribution rate  $m$  at point  $t_1$ .

In Figure 1 we have also depicted that unemployment contribution rate, which would be collected, if the system were all the time operated as a PAYG system. Let us denote it by  $m'$ . At point  $t_1$  and onwards the contribution rates in both these systems would be equal.<sup>5</sup> This holds up to the point in time when the turn again to a decline the rate of unemployment requires a decision on what to do with the buffer system before unemployment returns to its initial level, which is also assumed to be the natural rate of unemployment.

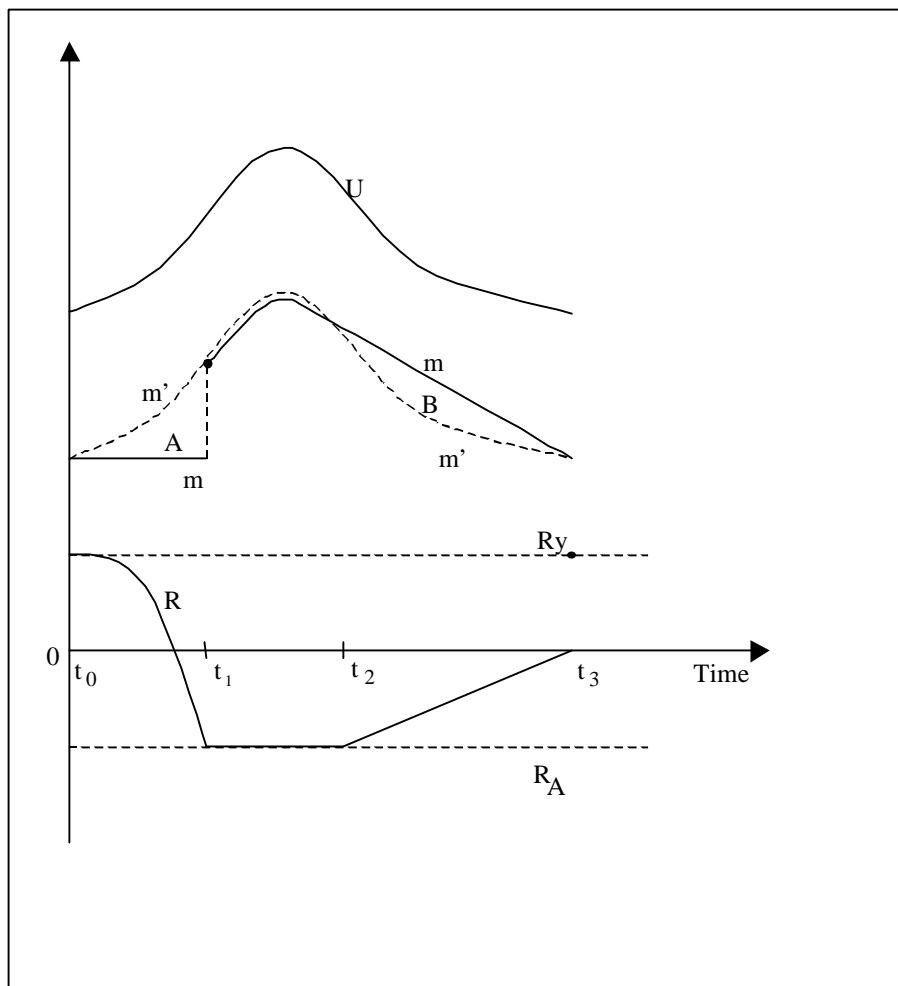
In principle there are *three* alternatives in this respect. Firstly, it is possible to aim at a rapid accumulation of the capital of the fund from its lower boundary, secondly, a slow rise in the capital, and thirdly, preserving it at the lower boundary before the rate of unemployment has returned to its initial level. In this last case the capital of the Fund would be raised only, if and when, there is a positive shock to employment after the return of the economy to the NAIRU. This alternative can be criticised from the angle that it is not certain whether the next shock is a boom or a new recession. In the latter case the buffer would give no help in the policy making and the UI contribution

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<sup>5</sup> In the figure, we have simplified the true situation so that the rate of unemployment is depicted in both alternatives to be same. This will be relaxed below in connection with the simulation of the system. In the following, we have also simplified by discarding the interest contributions and revenues by the fund, because they are fairly small. This does not have any major bearing to the results of the analysis.

rate would all the time be in accordance with  $m'$ . And on the hand, it can be argued that currently these funds are being cumulated, even though according to many estimates the rate of unemployment exceeds its equilibrium level of NAIRU. So, we can assert that the funds are being collected if only the rate of unemployment is declining. In Figure 1 it is assumed that the second of the above alternatives is followed.

**Figure 1. The operation of the EMU buffer in a recession**



The EMU buffer initially produces a lower labour cost than the PAYG system and is thereby better with regard to employment. This is depicted by area A in the Figure. With respect to area B, which is created by the new accumulation phase of the Fund, the situation is the reverse. The net overall gain in unemployment now depends on the relative sizes of the two areas and on the fact that there is a difference between their timing, i.e., B is realised only after A. Area A does not depend on, what kind of poli-

cies are subsequently pursued to collect the capital of the Fund, which has only an impact on area B. Area B is the bigger, the higher the capital of the Fund is raised in point  $t_3$ .

In the actual process of the ongoing accumulation of the EMU buffers, it has been notably recognised and agreed that they are collected in such a way that the rise in total labour costs is what the employers can afford, i.e., which maintains the profitability of the firms. This hike in labour costs is made by the rate of inflation, being in accordance with the inflation target by the ECB, added to the rise in productivity. So, in effect the wage earners have been satisfied with a smaller wage hikes during the accumulation phase of the funds. Can this be the case also when operating the EMU buffer funds in the future? This looks, however, quite unrealistic. Namely, if this just stated case would always apply, then the buffer fund would operate identically as a PAYG system with respect to the total labour costs by the employers, because the path of total labour cost (wages added by the indirect labour costs) were the same in the two systems. So, we must separate the current stage of accumulation of the funds and the possible use of them. If and when this degree of compensation is not complete, the labour cost by the employers differs between these two systems, the EMU buffer and the PAYG system, which also implies that the evolution of the employment situation is not the same in the two systems. In that case, where the rise in total labour costs is smaller, the change in employment is also better. We can infer that the more flexibly employment depends on the change in the labour cost and the less the wages move in the opposite direction after the change in the social security contributions, the better the EMU buffer system performs with respect to employment in comparison to the PAYG system.

Let us now carry out a numerical simulation of this comparison. As was the case in Figure 1, we assume that the UI Fund is at its maximum level when the hypothetical shock hits the economy. We compare three alternative systems:

- 1) A fully funded (FF) system, where there is no lower boundary defined or effectively met in the recession as to the capital of the fund. In this case the UI contribution rate of the employers is maintained at the initial level throughout the recession,

- 2) A PAYG system, where the contribution rate is determined so that the current benefits and receipts are kept in balance each year,
- 3) An EMU buffer fund system, which includes elements of both types, i.e., it is like a FF system, when the capital of the Fund is within the upper and lower boundary, and as a PAYG system when these boundaries would be exceeded.

The simulation is calibrated to reality so that with the current UI contribution rate (that of the employer and of the employee together), which is on average 4.15 per cent of the wage sum, the Fund is in balance with the current rate of unemployment of 10 per cent. This produces the outcome that the replacement rate is 37.4 per cent.

The hypothetical recession is of the following kind. The initial level of unemployment is 10 per cent, and then the economy faces a sizeable recessionary shock, which raises the rate of unemployment in the two following years, under a FF system, first to 12 per cent and then to 14 per cent. After that the economy starts to adjust so that the rate of unemployment declines first to 12 and then back to the initial level of 10 per cent.

When making this simulation, we have to take into account two relationships. Firstly, the UI contribution borne by the employers differs between the alternative systems, which leads to a different path of unemployment. The different path of unemployment creates a different need to collect UI revenues, which again, through the UI contribution rate, has an effect on unemployment. The simultaneous equilibrium of these two relations determines the rate of unemployment and the UI contribution rate in the different social security systems, outlined above. In the EMU buffer system, there is still a third relationship, which has an effect on the outcome and which was mentioned above. The outcome of the system also depends on the decisions concerning the capital of the UI Fund to be made when its capacity to manoeuvre has been exhausted in a recession, and the time comes to decide, what do with the capital of the Fund.

We need three key parameters in the simulation exercise. The first of them is the effect of a change in the labour cost on unemployment. Here we have used the estimation result in Alho (1996), according to which a one per cent rise in the real labour cost leads in the first year to as rise in the rate of unemployment by 0.2 percentage points. The other parameter describes how much the change in the indirect labour cost of the firms is reflected as a change in the opposite direction in the wage setting be-

haviour of the unions. Quite diverse estimate of this has been reached in the various econometric wage equations in Finland, the effect ranging from one extreme, no compensation, to the other of full compensation. In the following, we have fixed this parameter to the middle point, 0.5. So, it means that when the social security cost of the employers rises so that the total labour cost rises by 1 per cent, the wage rate will decline by 0.5 per cent. The third parameter describes the dynamics of the process. According to Alho (1996) the rate of unemployment depends with a coefficient of 0.74, in addition to the other factors defined above, on its lagged value with one year.<sup>6</sup>

The results are presented in Table 1, where the size of the UI Fund, the UI contribution rate (contribution in relation to the wage rate) and the rate of unemployment are shown. As can be seen from Table 1, a FF system, with a completely fixed UI contribution rate, leads to the UI Fund in such a deep recession to be markedly negative. This also holds in the EMU buffer system, which means that in period 2 corrective measures have to be taken to raise the UI contribution rate so much that the capital of the Fund does not go under the FIM –3 billion threshold. In the next two periods we have arbitrarily fixed the Fund so that at the end of the whole time period there is a return to a zero level of capital. On this issue some more simulations will be made in Table 2, see below.

It is noteworthy in the results in Table 1 that with respect to the rate of unemployment there are only surprisingly small differences. For each system a discounted and per period calculated average unemployment rate (using a discount rate of 5 per cent) is calculated. Now, the EMU Buffer is better than the PAYG only by 0.1 percentage point over the cycle. In the number of unemployed persons this difference means a couple of thousand persons per year on average. This small gain is due to the fact, raised above in connection with Figure 1, that the EMU buffer is worse than the PAYG system in that phase when the funds are restored. The biggest gain of the EMU buffer is also small, only some 6 000 persons in years 2 and 3.

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<sup>6</sup> Further, we assume that the change in the unemployment insurance contribution in full affects the part of the total contribution paid by the employers.

In contrast, the difference between the UI contribution rates is quite sizeable. The difference in favour of the buffer system is at its biggest 2 percentage points, which is a marked gain. On the other hand, the PAYG is in the last years better, the difference being some 0.5 percentage points.

In Table 2 comparisons are made with respect to what is the effect of the policies pursued with respect to the capital of the UI Fund at the end of the simulation period. As mentioned above, there are three alternatives. In the first of them, the capital of the Fund is returned back to the initial pre-shock level by raising the UI contribution rate in years 3 and 4. The other alternative entails no restoration of the Fund's capital in the period considered, but it is postponed to take place outside it. The third alternative lies between these two and is the same as that considered in Table 1 (and in Figure 1). According to the results in Table 2 the policy with respect to the capital of the Fund has importance so that the biggest annual difference between the rates of unemployment between the extreme cases 1 and 2 would be 0.25 percentage points. The difference between the UI contribution rates is almost 1.5 percentage points. So we can infer, that the policies with respect to the Fund's capital has a bearing as to the outcome of it, as was also to be expected.

**Table 1. Simulation of the different UI systems in a hypothetical recession**

Period	Fully funded (FF)			PAYG			EMU Buffer		
	Unem- plov- ment, %	UI con- tribution rate, %	Fund, Bill. FIM	Unem- plov- ment, %	UI con- tribution rate, %	Fund, Bill. FIM	Unem- plov- ment, %	UI con- tribution rate, %	Fund, Bill. FIM*
0	10	4.15	3.00	10	4.15	3.00	10	4.15	3.00
1	12	4.15	0.81	12.099	5.14	3.00	12	4.15	0.26
2	14	4.15	-3.57	14.281	6.22	3.00	14.027	4.42	-3.00
3	12	4.15	-5.76	12.317	5.25	3.00	12.188	5.83	-1.50
4	10	4.15	-5.76	10.246	4.26	3.00	10.212	4.88	0

\* Specifically defined for periods 3 and 4, see the text

**Table 2. Comparison of different EMU buffers with respect to restoration of the capital of the Fund at the end of the time interval, on explanations, see the text**

Period	Return to the pre-crisis level, $R = R_Y$			No return, $R = R_A$			Return to the level $R = 0$		
	Unem- plov- ment, %	UI con- tribution rate, %	Fund, Bill. FIM	Unem- plov- ment, %	UI con- tribution rate, %	Fund, Bill. FIM	Unem- plov- ment, %	UI con- tribution, rate, %.	Fund, Bill. FIM
0	10	4.15	3.00	10	4.15	3.00	10	4.15	3.00
1	12	4.15	0.81	12	5.14	0.81	12	4.15	0.26
2	14.027	4.42	-3.00	14.027	6.18	-3.00	14.027	4.42	-3.00
3	12.256	6.51	0	12.120	5.14	-3.00	12.188	5.83	-1.50
4	10.331	5.57	3.00	10.093	4.15	-3.00	10.212	4.88	0

### 3. Is there a moral hazard in the buffer system?

It was stated in the Introduction that the trade unions were the active partner behind the EMU buffer funds and that their intention was in this way to mitigate the pressure towards both labour shedding and downward nominal wage adjustment in EMU.

If the necessity by the firms to immediately reduce employment in a recession is reduced through establishment of the buffers in the above sense, it is likely that there is a smaller incentive by the unions to contribute to the task of maintaining employment in a recession through nominal wage cuts, being then a substitute for the loss of national sovereignty in monetary policy.<sup>7</sup> Accordingly, it has also been argued that the EMU buffers may lull the unions and the employers into a “careless” behaviour of the kind of a moral hazard, as they are aware that there is no big immediate need to start the painful process of wage adjustment immediately when the shock hits. Let us now make an analysis of this.

Let the union have an instantaneous preference function  $V$ ,

$$V = (WL + eWU)/P,$$

where  $W$  is the wage rate,  $L$  is the number of employed and  $U$  is the number of unemployed and  $L + U = N$ , a fixed labour force,  $e$  is the replacement rate, i.e., the ratio of the unemployment benefit to the wage rate, and  $P$  the price level. The aggregate profits  $\Pi$  of the firms are

$$\Pi = PAF(L) - W(1+m)L = PAF(L) - WL - (eWU - S),$$

where  $F$  is the production function,  $A$  is total factor productivity, and  $S$  is the deficit in the social security system. The price level  $P$  is fixed to unity in the sequel in the

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<sup>7</sup> A high level of social security may in itself either slow down or speed up the real wage adjustment. Because of the good social protection the workers are not ready to reduce their wage demands, as the reservation wage of being unemployed added to the value of leisure is very near the current wage rate (or even above it). On the other hand, if the social security system is very good, and consequently the income tax rates are high and progressive, a nominal wage cut (or a smaller rate of increase) only results in a rather small reduction in the after-tax net real wage rate.

small open economy. Consider a one-shot game of wage negotiation. The timing of events is such that first an adverse asymmetric shock hits the economy,  $dA < 0$ , and the government decides on the size of the possible deficit in the social security system,  $S > 0$ . The single monopoly union and the firms then engage in a Nash bargaining game negotiating over the wage rate with powers  $\theta$  and  $1-\theta$ , respectively. Thereby  $(V-V_0)^\theta(\Pi-\Pi_0)^{1-\theta}$ , where  $V_0$  and  $\Pi_0$  are fall-back levels of utilities of the parties, is maximised with respect to the wage rate  $W$ , under the condition that the firms then select the level of employment.

It has been earlier proved by Dowrick (1989), i.a., that in this kind of bargaining framework (allowing for market power by the firms), the equilibrium wage is a decreasing function of the firms' fall-back profits, i.e., the profits they would reach in case of no agreement with the unions. In our case there is a shift upward in the firms' profits and thereby a reduction in the fall-back level of profits, if the deficit  $S$  in the social security system rises. So, we can infer that now the wage rate is increasing when the deficit in the social security system rises.

In a similar way we may conclude that wage rate reacts negatively to the productivity shock  $dA < 0$ , as this change reduces the profits of the firms and works similarly as rise in the fall-back profit of the firms and this leads to a lower wage rate as an outcome of the negotiations. So, we can infer that the labour market reacts in the right way to an adverse shock, but, however, the magnitude of the real wage adjustment is reduced through the possibility to run a deficit in the social security system. There is indeed an element of the moral hazard in the EMU buffer system, as is also intuitively quite evident.

If we would instead consider this bargaining as a dynamic game, where the shock is a permanent one so that, in a two-period case,  $A_2 = A_1$ , and the initial deficit in the social security system has to be reversed over time, so that  $S_1 + S_2 = 0$ , it is evident that the above result will be mitigated. The perverse reaction in wages due to the deficit in the social security system would be clearly smaller than above, the magnitude of which depending on how myopic or far-sighted the unions and the employers are. In addition to the post-shock analysis, we could also envisage an ex ante situation.

Similarly, as above, we can infer that the existence of the buffers leads to more aggressive wage demands and acceptance of them, because the partners know that the adjustment is for some time taken care by the buffers. More quantitative analysis is needed on this point.

#### **4. Should the social security benefits be raised or lowered in a recession?**

The expenses on social security are cyclical due to two reasons. Firstly, in a recession the number of persons eligible for these benefits rises as unemployment rises, and secondly, the average benefit per person typically rises due to policy measures and the internal progressivity of the system.<sup>8</sup> This rise in the social security benefits means that also the social security contributions by the employers and employees are bound to rise, *ceteris paribus*, in a recession. Note that above we treated  $e$  throughout as a constant.

Let us finally consider what kind of policies should be pursued with respect to the social security benefits and contributions in a possible recession in EMU. Should the social security benefits be raised or lowered? There are two conflicting views, which were also both heard during in the deep crisis in the Finnish economy in the early 1990s. The social security benefits are a cost to the firms, which they cannot shift on to their prices in a depressed economy with a big slack. But the benefits are simultaneously a component of the disposable income of the unemployed and those eligible to the benefits and thereby they maintain the purchasing power and consumer demand for the domestic production.

We now impose that the criterion to decide between these two policies is to maintain employment as high as possible. We assume that there is an ample supply of resources, notably workers who could be employed at a constant wage level, if there would be more demand for them. There are neither other effective constraints hampering this process of recovery, like excessive foreign indebtedness.

Define consumption  $C$  (or more broadly consumption, investment and export demand) to consist of that by the employed and unemployed and that made out of capital income (profits)

$$(1) \quad C = c_L WL + c_U(eW)U + c_\Pi \Pi,$$

where  $c_L$  ( $c_U$ ) is the propensity to consume by the employed out of wages (unemployed out of the unemployment benefits),  $c_\Pi$  is the propensity to consume out of profits  $\Pi$ , and  $W$  is now the real product wage. The national income is split into profits and labour income.

$$(2) \quad Q = W(1+m)L + \Pi,$$

where  $m$  is the rate of indirect labour cost, i.e., the social security contribution rate by the employers. The national income accounting identity is,

$$(3) \quad Q = D + C + (X-tQ),$$

where  $Q$  is production (GDP),  $D$  is autonomous domestic demand (investment and public expenditure),  $X$  is exports,  $M = tQ$  is imports, where  $t$  is the propensity to import. The labour force  $N$  is a fixed quantity,

$$(4) \quad L + U = N.$$

The demand for labour depends on the volume of production and the real labour cost. Let us first define this as a standard logarithmic function,

$$(5) \quad \log(L) = b + \log(Q) - \sigma \log(W(1+m)),$$

where  $\sigma$  is the elasticity of substitution between capital and labour,  $\sigma > 0$ .

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<sup>8</sup> Alho and Kaseva (1999) estimate that in Finland the elasticity of the deviation of the average benefit per person from its trend with respect to the output gap of GDP is  $-1.3$ .

The social security system is based on contributions, collected from the wage sum. So we have,

$$(6) \quad mWL = eWU - S,$$

where  $S$  is the again deficit in this system in a recession and  $e$  is the replacement rate. It is self evident that if the deficit  $S$  could be made as large as possible without any limits, this is the best policy to be followed, because raising benefits and cutting employer costs are both expansionary policies in the short run. This has been analysed already above, see Table 2. That is why we carry out the following analysis keeping the deficit as fixed,  $dS = 0$ .

Let us further assume that in a depression the real wage rate does not adjust downward so that it is completely rigid, as was the case in the Finnish depression to a large degree. The real labour cost was assumed in Section 2 to change in an opposite direction when the social security contribution rate  $m$  is changed. Let us now assume in contrast that there is no such adjustment, as is most likely to be the case in severe recession. Let us next differentiate the above model with respect to employment and the replacement rate (or, equivalently, the UI contribution rate) taking into account the behavioural constraints and the accounting identity of the social security system (6). In order to do so, let us rewrite the logarithmic labour demand function into the following arithmetic form,

$$(5)' \quad dL = (L/Q)dQ - (\sigma L/W(1+m))d(W(1+m)) .$$

As the real wage rate is constant, the differential of the wage rate is  $d(W(1+m)) = W(dm)$ . Insert now  $dQ$  from (3) into the labour demand equation (5)', after first inserting into (3) expressions (1) and (2). Now we reach the following result concerning the policies related to the social security system in a recession,

*Proposition. In order to enhance employment in a recession it is worth while to increase social benefits and finance them by additional social security contributions of the employers, if*

$$(7) \quad \frac{c_U - c_\Pi}{1 - c_\Pi + t} \left( \frac{WL}{Q} \right) - s \frac{1}{1 + m} > 0.$$

*If (7) < 0, it pays to cut the social security contributions and consequently the benefits in a recession.*

The interpretation of the result (7) is straightforward. When the benefits of the unemployed are raised, the increase in their consumption, as depicted by the parameter  $c_U$ , leads to an increase in employment, but at the same time the consequent rise in their income and the rise in the labour cost leads to a cut in profits, which lowers the expenditure (the term  $-c_\Pi$ ).<sup>9</sup> The net effect of these has to be multiplied by the Keynesian multiplier related to the capital income, which is  $1/(1-c_\Pi+t)$ , and this will be weighed by the share of the labour income in national income. This expansionary demand impact through the goods market is contrasted to the supply effect on employment caused by the consequent rise in the labour cost through the substitution effect.

Immediately we can infer from (7) that if the marginal propensity to consume (or in general demand) out of profits and the unemployment benefits is the same, it will always pay to cut social security benefits and thereby to lower the social security contributions of the employers. However, as it is normally considered that marginal propensity to consume by the unemployed is higher than that out of the capital costs, it cannot be a priori stated, which is the most profitable way to proceed in order to maintain employment. The result depends on what is the relationship between these and other relevant parameters of the model and is thereby an empirical issue.

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<sup>9</sup> In equation (1), the effect of the capital income on total demand and thereby on output is described using the consumption equation, but as well, taking a broader perspective, we can think the parameter  $c_\Pi$  to describe the influence of profits on total demand through investment (the profitability channel) and exports (the competitiveness channel). This does not have any bearing as to the conclusions of the paper and will be allowed for in the empirical estimation below.

We estimated equations (1) and (5) and the import equation, in a difference form, for annual Finnish data of the period 1960-99. In the estimation, the profit variable is lagged by a year and a time trend added to equation (5) to represent the growth in productivity. The results concerning the key parameters of the model are collected in Table 3.

**Table 3. The estimation results of the key parameters, in parentheses the standard errors of the estimates**

Parameter	Consumption as dependent variable in (1)	Total demand as dependent variable in (1)*
$c_L$	0.479 (0.117)	-0.625 (0.332)
$c_U$	1.451 (0.352)	0.192 (0.998)
$c_{\Pi}$	-0.037 (0.102)	0.705 (0.290)
$t$	0.256 (0.044)	
$\sigma$	0.311 (0.052)	
Condition (7)	0.188	-0.595
$P(7) = 0$	0.097	0.329

\* Sum of private consumption, private investment and exports.

We clearly see that the results crucially depend on, whether we consider consumption or total demand (private consumption plus private investment and exports) as the variable to be explained in equation (1) (see footnote 9). In the first specification, the propensity to consume out of unemployment benefits is very high, markedly bigger than unity, while that related to capital income is zero. This pattern is, however, turned upside down, when we go over to having the total demand as the dependent variable in (1). We then test, whether the condition (7) deviates from zero. The test is statistically inconclusive in both specifications and indicate towards conflicting policy conclusions, as is also easy to understand. In the wider total demand specification of equation (1) the value of the expression (7) quite clearly suggests that, in a recession, it would be better to cut the social security contributions by the firms, irrespective of

the fact that this policy leads to a cut in the social security benefits and thereby in consumption. However, this result is statistically not significant, but this inconclusive outcome for the most part depends on the very uncertain value of the  $c_U$  parameter in this case (and also for a smaller part on the uncertainty of the multiplier). More empirical evidence, utilising a more elaborated structural model is needed to get clear evidence on this point.

Above we assumed that the deficit of the social security system is given. If the deficit can be expanded so that  $dS > 0$ , it is worth while either to lower the indirect labour costs or raise the unemployment benefits, according to whether (7) is negative or positive, but operate only on one side of the system, not on both, except the case where (7) holds as an equality.

## 5. Concluding remarks

Here we have tried to give some basic insight for the discussion concerning the functioning of the social security system in a recession in the new environment imposed by EMU. As a conclusion, it can be inferred that it may be the case that too high hopes are directed towards the EMU buffers as a tool of stabilization policies. They can be seen as a step into the right direction, but their capacity to act as a buffer for employment is anyway quite limited, if the adverse shock is a big one, as was assumed above. The buffers can also lull the labour market participants to postpone the necessary actions eventually needed in such a situation. Finally it was evaluated, what kind of expansionary policies should be pursued if the goal is to maintain employment in a recession. The preliminary results point towards the importance of cutting the indirect labour costs, even at the cost of social security benefits, although more evidence on this point is needed.

## References

Alho, K. (1996): EMU, Unemployment and the Equilibrium in the Labour Market (in Finnish), in: Allén, T. and Kaitila, V. (eds.), *The Labour Market in EMU*, ETLA, Series B 127.

Alho, K. (1998): Profit Sharing – The Payroll System in the EMU Age, *Labour Force Studies*, No. 194, Finnish Ministry of Labour.

Alho, K. and Kaseva, H. (1999): EMU, Public Sector Financing and Financing of Social Security, *The Social Insurance Institution of Finland, Studies*, No. 50, and ETLA Series B 159.

Dowrick, S. (1989): “Union-Oligopoly Bargaining”, *The Economic Journal*, Vol. 99, No. 398, 1123-1142, December.

Holm, P. and Mäkinen, M. (1998): “The Unemployment Insurance System and Its Capacity to Act as an EMU Buffer” (in Finnish), *The Government Institute for Economic Research, Discussion Papers*, No 157.

Holm, P., Kiander, J. and Tossavainen, P. (1999): ”Social Security Funds, Payroll Tax Adjustment and Real Exchange Rate: The Finnish Model, *The Government Institute for Economic Research, Discussion Papers*, 198.