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EXPERIENCE OF SWEDEN

by

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Sweden stood out as a conspicuous exception to the high Western European unemployment in the eighties. Swedish unemployment rose very moderately in the early eighties, and towards the end of the decade it even returned to the low levels of the sixties and early seventies (Figure 1). Unlike in the rest of Western Europe long-term unemployment so far has not emerged as a serious problem (Figure 2). These divergent Swedish experiences have attracted much international attention, and Swedish policies have come to be regarded by many as a blueprint.

There seem to exist three major explanations for the earlier successful Swedish employment record. The first one stresses how the active labour market policies, as opposed to the payment of passive unemployment benefits of long duration in many Western European countries, have counteracted long-term unemployment (e.g., Layard, 1989, 1990; Jackman, Pissarides and Savouri, 1990; Jackman, Layard and Nickell, 1991; OECD Employment Outlook, 1989-91; and OECD, 1990). The second explanation points to the moderating influence on real wages of centralized bargaining (e.g., Jackman, 1990; Layard, 1990; Jackman et al., 1991; and Layard & Nickell, 1991). The third one, finally, emphasizes the general macro policy stance and the major exchange rate devaluations around 1980 (e.g., Bosworth & Rivlin, 1987; Bergman et al., 1990, 1991; Gylfason, 1990 and Lindbeck, 1992). The aim of this paper is to look deeper into these explanations. My main conclusion is that labour market policy and centralized bargaining may have been overrated as explanatory factors in the international discussion, and that the crucial determinant is instead likely to have been the general macro policy stance. Another major point is that the Swedish experience provides a good example of the risk that inflationary policies are

pursued when policy makers are not disciplined by binding commitments. As a consequence Sweden now (in 1992-93) appears to be facing its most serious unemployment crisis in the post-war period, and it does indeed remain an open question whether Sweden in the future will be able to maintain its favourable employment record.

1. Swedish labour market policies

Table 1 shows that Sweden spends a much larger proportion of labour market expenditures on active policy measures than other countries in Western Europe. These policies consist of measures to facilitate matching (placement and counselling services), labour market training programmes in order to increase the effective supply of labour and adjust it to demand, and pure job creation (relief work).

Figure 3 shows that labour market programmes (training and job creation) in Sweden exhibited a trendwise increase up to the early eighties. The strongest trend has been for training. There have also been clear cyclical variations. In 1977-78 and 1983-84 2-2.5 percent of the labour force participated in various programmes. The cyclical pattern is most pronounced for relief work, but there is such a tendency for labour market training as well.

Another way of measuring the importance of labour market programmes is to relate the number of programme participants to what I shall label total unemployment (the sum of openly unemployed and programme participants). I denote this ratio the accommodative stance of labour market policy. It can be taken as a measure of the probability of being offered participation in a labour market programme when being out of work. As can be seen from Figure 4, there was a steady increase of the accommodative stance up to the late seventies but also a substantial

reduction in the early eighties. The picture of how Swedish labour market policies have developed is thus not clear-cut: on the one hand the number of programme participants reached a maximum in the late seventies, on the other hand the relative importance of active labour market policies (the accommodative stance) decreased. When comparing the two major downturns in 1976-78 and 1982-84, the programmes appear to have been biased towards training in the former period, whereas the relative importance of relief work was larger in the latter.

There has been a tendency both in Sweden and elsewhere to take the value of Swedish labour market policy for granted on *à priori* grounds. It is only in the last few years that the effects of these policies have opened up as a major research area. This research has proceeded along several lines.

The first line of research is micro studies on panel data for individuals of how reemployment probabilities and future earnings capacity are affected by labour market programmes. As summarized by Björklund (1990), intensified placement activities on part of the labour market exchanges appear to have had unambiguously positive effects, whereas it does not seem possible to draw clear-cut conclusions regarding training and relief work. Edin & Holmlund (1991) have pointed to the possibility that relief work reduces reemployment probabilities for participants as long as they remain in the programmes, because search activity is then lowered, although the long-run effects are likely to be positive.

Table 1. Active versus passive labour market policies
(expenditure in percent of GDP 1985-1990).

	Western Europe	Sweden
Public employment services and administration	0.1	0.2
Labour market training	0.2	0.5
Youth measures	0.2	0.1
Subsidized employment and relief work	0.2	0.2
<u>Total active labour market programmes</u>	0.7	1.0
Unemployment compensation	1.5	0.7
Early retirement pensions	0.3	0.1
<u>Total income maintenance</u>	1.8	0.8
<u>Total measures</u>	2.5	1.8
Active measures/total measures (percent)	27.9	56.9

Source: *OECD Employment Outlook*, July 1991, Table A1.

Western Europe refers to an unweighted average for Austria, Belgium, France, Italy, Netherlands, the United Kingdom and West Germany. Measures for disabled workers have not been included.

The second strand of research concerns wage behaviour. It is a consistent finding in studies of wage setting that labour market programmes seem to put less downward pressure on wages than open unemployment (see Appendix 1.1). In terms of a Layard-Nickell (1986) labour-market diagram (Figure 5), an increased accommodative stance (a larger share of job seekers in labour market programmes) appears to shift

the wage-setting schedule upwards. If so, the result is a higher real labour cost and thus a crowding out of regular employment opportunities.

The wage-raising effects of labour market policies are very strong according to the studies made. Some of them find that labour market programmes seem to influence wages in the same way as regular employment (Newell & Symons, 1987; Wadensjö, 1987; Holmlund, 1990; and Calmfors & Nymoen, 1990). Since open unemployment is usually found to reduce wages strongly, already this result means that an accommodating expansion of labour market programmes in order to avoid open unemployment in a downswing is likely to result in substantially higher real wages than a non-accommodating policy that permits open unemployment. However, several of the studies show the even more surprising result that an expansion of labour market programmes appears to create more wage pressure than an increase of regular employment (Calmfors & Forslund, 1990, 1991; Nilsson, 1987, 1990; Forslund, 1991; Skedinger, 1991; Östros, 1991; and Löfgren & Wikström, 1991). Taken at face value, these findings are thus at odds with the conventional view that labour market programmes should tend to reduce wages because they promote competition for jobs by maintaining or improving human skills and encouraging more active search behaviour (e.g., Layard, 1989, 1990; and Jackman et al. 1991).¹

¹ Few of the studies have attempted to discriminate between the effects of training programmes, where the equivalent of unemployment compensation is paid, and relief work, where market wages are paid. When this has been tried, the results are not clear-cut. Löfgren & Wikström (1991) find training programmes to have a long-run positive effect on wages but no short-run effect, whereas the opposite applies to relief work. Forslund (1992), on the contrary, finds that open unemployment and training programmes exert the same downward pressures on wages, whereas relief work gives upward pressure. Edin et al. (1992) find that both relief work and training programmes exert downward pressure. The latter study is so far the only one, according to which there appear to be no crowding-out effects of labour market programmes.

One reason why labour market programmes might raise wages is that they provide a favourable alternative to open unemployment. If programmes are associated with higher welfare than open unemployment -- for instance because remuneration is higher, as is the case of Swedish relief works, which pay market wages -- an increased accommodative stance may weaken incentives for wage restraint in much the same way as a rise of unemployment benefits. Wage-raising effects could also occur to the extent that programmes create expectations of higher future earnings capacity and better reemployment prospects. Such theoretical results will come through both in bargaining models, where union incentives to avoid the risks of lay-offs are reduced, and in efficiency-wage models, where employers may be forced to set higher wages in order to attract and keep labour (Calmfors and Lang, 1992).

A possible interpretation is that, at the low rates of unemployment that Sweden has experienced, the wage-raising effects dominate over the wage-reducing effects of increased competition for jobs stressed by Jackman et al. (1991). The reason could be that Swedish labour market policies -- especially in the seventies -- may have been overambitious and served more to give 'insiders' in the labour market a guarantee of avoiding open unemployment than to helping 'outsiders' to compete with insiders (e.g., Wadensjö, 1979, 1987; and Arbetsmarknadsdepartementets årsbok, 1991). This impression is underscored by the fact that labour market policies in the late seventies were heavily biased towards measures like subsidies for training within firms in the case of lay-offs threats (Calmfors and Forslund, 1990, 1991).² Contrary to what has been

² Another indication is that lay-offs accounted for a smaller fraction of the flow into unemployment in the 1976-78 than in the 1982-84 downswing (17 versus 26 percent according to Arbetsmarknadsdepartementets årsbok, 1991).

the conventional wisdom in Sweden (the so called Rehn-Meidner model), it is indeed theoretically possible that such selective measures designed to counteract open unemployment wherever it occurs are more wage-raising than an aggregate employment rise, because they imply a larger reduction of the unemployment risk of the individual worker (Calmfors & Nymoen, 1990; Calmfors & Forslund, 1991; and Forslund, 1992).

The third type of evidence relates to the Beveridge curve, i.e. the vacancy/unemployment relationship. It has been noted that the Swedish Beveridge curve has remained stable over time, whereas there has been a marked outward shift for most countries in Western Europe. This difference has been attributed to the labour market programmes in Sweden (e.g., Jackman et al., 1990, 1991; Bourdet & Persson, 1990, 1991; and Arbetsmarknadsdepartementets årsbok, 1991). The argument is that the labour market programmes ought to have raised the search effectiveness of job seekers and improved matching probabilities by helping to adjust the skills of the unemployed to demand. One would expect the main effect of this to be a reduction of employers' hiring costs, which ought to shift the labour-demand schedule to the right in Figure 5 (Calmfors & Lang, 1992).

The discussion of how labour market programmes have affected the Swedish Beveridge curve has, however, in my view been rather unsatisfactory. It is true that the relationship between vacancies and open unemployment has remained stable since the early sixties (Figure 6). This is not the proper relationship to study in a situation with large labour market programmes, though, since programme participants belong also to the pool of job seekers. Suppose, for instance, that participants in programmes and openly unemployed have the same search effectiveness, and that we have a stable Beveridge relationship between

total unemployment (the sum of the the openly unemployed and programme participants) and vacancies. Then a transfer of job seekers from open unemployment to programmes will, of course, shift the relationship between vacancies and open unemployment inwards. However, the reason is purely arithmetical; it does not reflect an increased search effectiveness on the part of the average job seeker. The relevant relationship to study is instead the one between vacancies and total unemployment (Figure 7), as developed in Appendix 1.2. Although this revised Beveridge curve exhibits no trend³ -- as it should, if the stability of the vacancy/open unemployment relationship had been bought at the expense of gradually expanding labour market programmes -- it looks far less stable and indeed follows the Western European pattern with outward-spiraling loops up to the mid-eighties. It does not "loop back" until in the general upswing with substantial unemployment reductions towards the end of the eighties.

Nor is it easy to find clear-cut econometric evidence in favour of the view that labour market programmes have had a favourable impact on the revised Beveridge curve in Sweden. A reinterpretation of the Jackman et al. (1990) results indicate a zero effect. A regression of my own gives similar results (see Appendix 1.2). The point has also been made that participants in labour market programmes (relief work) search less effectively than the openly unemployed (Holmlund, 1990; and Edin & Holmlund, 1991).

The results described cast doubts on the labour market policy explanation of the low Swedish unemployment. To sustain it, one has to resort to arguments like the following ones.

³ See also Bourdet & Persson (1991).

(i) The econometric studies made have not dealt adequately with the statistical problems of identification and simultaneity (the causal direction might be from high wages and low employment to an expansion of programmes rather than the opposite) and/or the time series used (going back at best to the early sixties) may be too short to allow reliable conclusions.

(ii) The effects of labour market policies are embedded in the structure of the economy and cannot be read off from marginal variations in policies over time (Layard, 1991).

(iii) The alternative to the Swedish active labour market policy would have been a system with long duration of passive unemployment benefits, as in many other Western European countries, which according to cross-country comparisons appear to be one of the main explanations for high unemployment (Burda, 1988; Jackman, 1990; Jackman *et al.*, 1991; and Layard & Nickell, 1991).

Although I do not want to rule out any of the above caveats, I would put most stress on arguments (ii) and (iii) (see also Appendix 1.1). They are consistent with the view that the results referred to above may reflect overambitious attempts to hold down open unemployment rather than a "healthy core" of labour market programmes. Argument (ii) also receives some support from cross-country regressions, according to which higher expenditure on active labour market measures appear to be associated with substantially lower open unemployment (Layard, 1990; Jackman *et al.*, 1991; and Layard & Nickell, 1991). Needless to say, however, a limited number of observations is an even more serious problem in such cross-country regressions than in the time series studies for Sweden. Indeed, Sweden is such an extreme outlier both in terms of low unemployment and large labour market programmes that the inclusion of

Sweden in a cross-country regression may affect the results substantially (Calmfors, 1991c).

It is a common claim that the reorientation of Swedish labour market policies with more explicit targeting on outsiders (primarily youth and long-term unemployed) in the eighties should have contributed strongly to the fall of long-term unemployment in the second half of the decade (e.g., Wadensjö, 1987, 1990; Bourdet & Persson, 1990, 1991; and Arbetsmarknadsdepartementets årsbok, 1991). Although one should expect positive effects from this policy shift on theoretical grounds, there does not to my knowledge exist any clear-cut evidence that long-term unemployment fell more than normally in response to the general fall of unemployment.⁴ Nor has the even more relevant question of whether the total rate of long-term unemployment (including both those in open unemployment and in programmes) fell more than could be explained by the general macroeconomic development been studied rigorously.

The targeting of programmes on young people in the eighties has not broken the trend towards higher total unemployment (open unemployment and participation in programmes) for this age group relative to other groups (Ohlsson, 1991; and Arbetsmarknadsdepartementets årsbok, 1991). Wadensjö (1987b) has argued that an expansion of youth programmes leads to a smaller reduction of open unemployment than the increase in the number of programme participants. A possible explanation is that the programmes for youth may have had strong wage-raising effects. Indeed, Skedinger (1991) found that the impact on wages for this group of outsiders appears

⁴ On the one hand, Bourdet & Persson (1990, 1991) point to a general trend towards increased long-term unemployment. On the other hand, Bourdet & Persson (1991) find, when comparing Swedish and French experiences, that the development of long-term unemployment has differed the most for the age groups (prime-aged workers) for which the extent of labour market policies has differed the most.

stronger than for other groups (of insiders) in the labour market. Equally disturbing for the "targeting approach" is the McCormick and Skedinger (1991) finding that labour market programmes may serve to preserve regional unemployment differences, because they tend to reduce outward migration from high-unemployment areas.

Even if one accepts my sceptical view of Swedish labour programmes, one should, however, be cautious when drawing policy conclusions from the Swedish experiences, at low rates of unemployment, for Western Europe in general. The potential benefits from more active labour market programmes should be expected to be larger the lower the initial level: the reason is, of course, that when expanding programmes one can start with the ones that are most profitable in terms of promoting the competitiveness of unemployed workers.

The effects of labour market programmes may also be more favourable at higher levels of unemployment when more targeting on the long-term unemployed becomes natural. There are several reasons for this. One is that the wage-raising effects of programmes are likely to be smaller the later in an "unemployment career" participation is offered, since the positive effects on the alternative expected welfare of a laid-off worker are then more heavily discounted (Calmfors & Lang, 1992). Another explanation is that in the absence of labour market programmes it will become more difficult to resist the political pressure to prolong the duration of passive unemployment benefits the higher unemployment is. Finally, the role of programmes in providing a work test, i. e. in verifying that job applicants are really willing to take on a job,

becomes more important the less frequent regular job offers are (Jackman *et al.*, 1991; and OECD Employment Outlook, 1991).⁵

One should also warn against over-optimism of what active labour market programmes can achieve, since they have not yet been used on a large scale anywhere in situations with high unemployment. A hypothesis might be that there exists some optimal range of unemployment where labour market programmes may be most useful. Below a low level of unemployment, problematic wage-raising effects may arise; above a certain level, it may be difficult to break the vicious circles of long-term unemployment once they have got firmly established.

The Swedish experience seems, however, to suggest a number of lessons that may be of general importance for Western Europe.

(i) In order to minimize the danger that active labour market policies reduce the incentives for wage restraint and active job search, it appears important that remuneration in programmes is substantially lower than market wages.

(ii) It may not be enough just to reduce the actual duration of unemployment benefits through an expansion of labour market programmes in Western Europe. To avoid increasing the expected utility (income) of not having a regular job, which would weaken the incentives for wage restraint and job search (Calmfors and Forslund, 1991), more active labour market programmes should probably be combined with institutional changes of the rules reducing the maximum duration of benefits.

⁵ By discouraging those that are not really at the disposal of the labour market from claiming unemployment benefits, the work test reduces the number of registered job applicants. This will tend to shift both the wage-setting and employment schedules in Figure 5 to the right. The reason is that the registered labour force falls, so that a given wage becomes associated with a higher employment rate along both curves.

(iii) Programmes should be explicitly targeted on the long-term unemployed and designed so as to promote active search for regular jobs and the mobility of labour between firms, sectors, regions and professions.

2. Centralized bargaining

A second popular explanation of the low Swedish unemployment takes its starting point in the high degree of real wage restraint that characterized the Swedish economy in the early eighties (Table 2). The conventional wisdom is that the crucial factor was highly centralized wage bargaining (Bruno & Sachs, 1985; Bean *et al.*, 1986; Newell & Symons, 1987; Layard, 1989, 1990; Jackman, 1990; and Jackman *et al.*, 1991).

Table 2. Real wage developments

	1967-72	1973-77	1978-83	1984-90
<i>Sweden</i>				
1. Consumption real wage growth	5.2	5.6	-0.4	2.2
2. Product real wage growth	7.3	4.6	0.7	2.5
3. Productivity growth	<u>6.4</u>	<u>2.6</u>	<u>3.9</u>	<u>2.8</u>
4. Discrepancy (2-3)	0.9	2.0	-3.2	-0.3
<i>Western Europe</i>				
1. Consumption real wage growth	6.2	5.6	1.6	1.6
2. Product real wage growth	7.7	6.8	3.2	1.8
3. Productivity growth	<u>6.3</u>	<u>5.0</u>	<u>4.4</u>	<u>3.4</u>
4. Discrepancy (2-3)	1.4	1.8	-1.2	-1.6

Sources: Money wage costs: *Wages and Total Labour Costs for Workers, International Survey*. The Swedish Employers' Federation. Various issues. The implicit value-added price deflator in manufacturing: *OECD National Accounts 1960-89*. Productivity: *OECD Economics and Statistics Department* and *US Department of Labor*. Consumer price index: *OECD Main Economic Indicators*.

Western Europe is an unweighted average for Austria, Belgium, France, Italy, the Netherlands, the United Kingdom and West Germany.

According to received theory, the negative externalities of high wages should be internalized when bargaining takes place between economy-wide union confederations and employer associations. One version of the argument refers to price externalities (e.g., Calmfors & Driffill, 1988; Moene et al., 1991; Calmfors, 1991b; and Jackman et al., 1991). When wage bargaining concerns only an individual sector of the economy, a rise of the real consumption wage there (the money wage deflated by the consumer price index) will also raise the relative price of the sector's output. This will hold back the rise of the sector's product real wage (the money wage deflated by the output price) with the consequence that both employment and profit decreases are reduced.⁶ In a conventional bargaining model, this weakens the incentives for wage restraint when wages are determined at the industry level. However, if wages are raised simultaneously in several sectors with more centralized bargaining, the possibilities to raise the relative prices of individual sectors are reduced. Hence a given increase of the real consumption wage results in a larger increase of the product real wage and therefore in larger employment and profit losses. Indeed, if completely centralized bargaining means that wages are raised uniformly throughout all sectors,

⁶ If we denote the consumer price index P_c , and a representative sector's real consumption wage w_c , real product wage w_p , nominal wage W , nominal output price P , and relative output price p_r , we have $w_c = W/P_c$, $w_p = W/P$ and $p_r = P/P_c$. Hence $w_p = w_c/p_r$. Since $L = L(w_p)$, where L is a representative sector's employment, and thus $\partial L/\partial w_c = (\partial L/\partial w_p)[p_r - w_c(\partial p_r/\partial w_c)]/p_r^2$, it follows that $|\partial L/\partial w_c|$ is smaller the larger is $\partial p_r/\partial w_c$. Moreover, since $\pi = p_r Y - w_c L$, where π is a representative sector's real profit and Y output, and $\partial \pi/\partial w_c = Y(\partial p_r/\partial w_c) - L$, it also follows that $|\partial \pi/\partial w_c|$ is smaller the larger is $\partial p_r/\partial w_c$.

no relative price can be changed in a closed economy without foreign trade. If so, there will be no counteracting effects on product real wages and thus a very strong incentive for wage restraint.⁷

The internalization argument exists also in several other versions. Rational wage setters at the central level will take into account that wage rises that reduce employment and output mean higher taxes because the cost for unemployment benefits increase and the tax base is reduced (Blanchard & Summers, 1987; and Calmfors & Driffill, 1988). A rational centralized union will also realize that aggregate wage increases reduce aggregate employment and thus the reemployment possibilities of those that are laid off in individual firms (Jackman, 1990; and Jackman *et al.*, 1991). It should also be able to internalize wage jealousy effect (Moene *et al.*, 1991). This is the example given in Appendix 2.1. A similar effect is likely to operate on the employer side for efficiency-wage reason (Layard, 1990; and Moene *et al.*, 1991): if worker effort or hiring and quits depend upon relative wages, individual employers are likely to bid up wages under decentralized wage setting in a way that can be avoided with coordination.

The above considerations would seem to give a strong theoretical underpinning to the claim that centralized bargaining promotes high employment. But a number of qualifications should be kept in mind.

(i) In a highly open economy like that of Sweden, there is a limit to the internalization of price effects. Even with completely

⁷ Note also that the same applies in an economy where bargaining has been decentralized to perfectly competitive firms. In a closed economy, where the only externalities refer to prices, this form of decentralized bargaining will produce the same wage outcome as completely centralized bargaining. According to the hump-shape hypothesis of Calmfors & Driffill (1988), all intermediate levels of centralization produce higher wages (see also Soskice, 1989; Moene *et al.*, 1991; Calmfors, 1991b, and Rowthorn (1992)).

centralized bargaining, there is still a wedge between consumption and product real wages, because prices of imports are determined on the world market. Hence, a uniform wage increase in the domestic economy will have a substantial effect on the price of domestic output relative to the price of domestic consumption. This holds back the rise of the real product wage following from a given increase of the real consumption wage, which reduces the incentives to real wage restraint (Calmfors, 1991b).

(ii) Moene (1988) and Moene et al., (1991) have pointed to the possibility that employers may have an incentive to choose higher employment levels under decentralized than centralized wage setting in order to affect the bargaining outcome. The idea is that under local bargaining it may be profitable for a firm to expand employment beyond the point where the marginal product equals the real product wage, because the resulting fall in output per worker (the surplus to be divided between the owners of the firm and each individual worker) will also reduce the wage. This mechanism would not operate under centralized bargaining, since the employment decision of an individual firm then has a negligible impact on the aggregate wage outcome. This reasoning builds on the assumption that there are large adjustment costs, so that firms must take long-term decisions on the labour to employ and are not free to adjust employment once wage contracts have been concluded (see Appendix 2.2).

(iii) There seems to be a tendency in much of the literature to exaggerate the actual amount of centralization that has characterized the Swedish economy (e.g., Bruno & Sachs, 1985; Newell & Symons, 1987; Layard, 1990; Jackman, 1990; and Jackman et al., 1991). There has never been complete centralization in the sense that more or less all wages

have been determined in the same bargain. Instead, central bargaining has in recent years meant that wages are determined by a small number of bargaining units. The Swedish Employers' Federation encompassed private firms accounting for 28 percent of the labour force in 1987, but of these, 16 percentage points belonged to LO (the Trade Union Congress for blue-collar workers) and 12 percentage points to PTK (a bargaining cartel of white-collar workers). The total public sector accounted for 32 percent of the labour force (Calmfors & Forslund, 1990). It could make a large difference whether wage effects are internalized completely or only to 1/3 or 1/4 (Calmfors & Driffill, 1988). In addition, the argument has been made that the existence of a few very large and competing wage earner organizations tends rather to reinforce union concerns over relative wages as compared to more decentralized systems (Calmfors, 1986).⁸ One should also note that the eighties, which is the period during which the development of unemployment in Sweden has differed the most from that of Western Europe, was characterized by a strong tendency towards more decentralized bargaining within both the private and the public sectors.⁹

(iv) A common view in the Swedish debate has been that centralized bargaining weakens the bargaining position of employers. The reason is the political constraints on using an economy-wide lock-out to meet union strikes confined to key groups of workers (Calmfors & Forslund, 1990). The 1980 general conflict in the labour market, when the liberal-

⁸ In a survey study, Nilsson (1987) finds some indications that comparisons between blue-collar and white-collar workers play a larger role at the central than at the local level.

⁹ In the private sector, there has been a development to industry-level bargaining, in the public sector the government and the two employer associations for local government, as well as the various wage earner organizations, have begun to act more independently (Elvander, 1988; and Calmfors & Forslund, 1990).

conservative government asked employers to withdraw their general lock-out has often been advanced as an example (Elvander, 1988). This argument runs counter to the one advanced by Jackman *et al.* (1991) and Layard & Nickell (1991) that employer cooperation strengthens the employer side, because it reduces worker possibilities of finding alternative jobs during a conflict (and the risks that individual firms will lose market shares to their domestic competitors).

(v) The high degree of centralization has been associated with a strong desire to set uniform wages and decrease wage differentials (the so called solidaristic wage policy). It is a common claim that this egalitarian ideology has been the main force holding the centralized Swedish trade union movement together (e.g., Flanagan 1987, 1991; Siven, 1987; and Elvander 1988). These wage policies led to a reduction of wage dispersion in the sixties and seventies (Figure 8) that seems to be without parallels in other market economies. The evening out of wage differentials is likely to have had adverse microeconomic effects on productivity because incentives for investment in human capital were weakened, and because the possibilities to use wage incentives to promote effort within individual firms were circumscribed. This may or may not have had negative employment effects depending on the extent to which negative productivity effects were shifted back on to wage earners. The negative employment effects of reduced relative-wage flexibility in the case of shocks hitting specific sectors, regions or groups of workers should be more clear-cut. One characteristic feature of wage developments in the seventies -- which has not been reversed subsequently -- was a substantial rise of the relative wage of young workers that appears likely to have contributed to the weak relative employment performance of this group (see Section 1). Skedinger (1991b) also argues

on the basis of McCormick & Skedinger (1991) that the wage equalization across regions has contributed strongly to the regional unemployment differences.

(vi) The most important qualification concerns the actual functioning of the bargaining system. The widespread conception that centralized wage-setting means bargaining only at the central level is simply wrong. Indeed, the earlier Swedish system is better characterized as one of multi-level bargaining, since the central negotiations were followed regularly by bargaining at both industry and local levels. As can be seen from Table 3 and Figure 9, wage drift (money wage increases in excess of the agreements at industry level) has made up around half of total wage increases and has varied between 2 and 7 percent per year. This raises the question of which bargaining level that really controls the final wage outcome.

Table 3: Wage drift as a percentage of total wage increases (annual averages)

1966-70	1971-75	1976-80	1981-85	1986-91
50.2	42.2	42.3	39.7	60.2

Source: The Swedish Employers' Federation

The interaction between central wage agreements and wage drift has long been a neglected research area, where most of the work has been purely empirical with unsatisfactory theoretical foundations. In recent years, however, more promising game-theoretical models, which analyze wage drift as the outcome of local bargaining (e.g. Holden, 1988; 1990a,b; Holmlund & Skedinger, 1990; and Moene et al., 1991) have been developed. A basic conclusion from this literature is that wage drift is

likely always to occur. The reason is that the bargaining positions of the parties at the local level are asymmetrical. Because local bargaining in the Swedish system has taken place under a formal peace clause (once the central or industry wage contract has been concluded), employers are obliged to pay workers the centrally agreed money wage. However, workers can inflict damage on the employer when the local parties fail to reach an agreement by working to rule or go-slow actions (or just by individually providing less effort). Thus, workers are likely always to obtain an extra wage increase in the local negotiations (see Appendix 2.2). As a consequence, the wage setters at the central level must be able to adjust the money wage increases they control to subsequent wage drift, if they are to attain their real wage objectives. At least at low rates of productivity growth, such as in the eighties, this is likely to mean real wage cuts as a result of the central negotiations. Whether these will be large enough for the central real wage target to be met is likely to depend upon the rate of inflation, since it is hard to envisage central money wage decreases (at least under "normal" conditions).¹⁰

One could even argue that there is likely to be a lower floor on central money wage increases, because wage setters at the central level need a certain "nominal room" for influencing relative wages according to their preferences (e.g., by pushing up wages for those who do not obtain wage drift) and to show all members that the central organization does something for them. This "nominal room" is likely to be larger, the higher the central ambitions to even out the wage distribution. Hibbs & Locking (1991) present evidence in favour of such a hypothesis: they show

¹⁰ An attempt at such central money wage cuts was made in Finland for 1992 in order to prevent unemployment from rising above 10 percent, but the attempt failed.

how an increased central push for wage equalization seems to raise both central and total money wage increases.

The above reasoning may help to explain the combination of real wage restraint and comparatively high inflation in Sweden in the eighties (see Figure 10). On the one hand, the central bargainers may have strived for real wage restraint because of various internalization effects, as discussed above. On the other hand, they may have been able to achieve it only because the high inflation made central money wage increases consistent with the need for real wage moderation at the central level in order to offset local wage drift. A possible hypothesis is that high inflation may be a necessary prerequisite for a centralized wage bargaining system to deliver real wage restraint (see also Holden, 1991). At low rates of inflation, multi-level bargaining may instead result in excessive real wage increases and a gradual deterioration of the country's relative cost position, unless rising unemployment is allowed to reduce wage drift. This kind of reasoning appears to be one of the main motivations for the Swedish employers' present desire for decentralizing bargaining to the level of individual firms (Calmfors, 1991a).

A crucial question would seem to be if one could simultaneously reap the benefits of internalization that a centralized system could potentially deliver and still avoid the dangers of multi-level bargaining. Bargaining only at plant level in a system where the central organizations continue to coordinate the negotiations might appear as a theoretical possibility. It would seem close to the Japanese system (Soskice, 1989). Whether such a transformation of the Swedish set-up can

be achieved in practice without just mimicking the traditional system remains, however, an open question ¹¹.

One could also ask how a system like the traditional Swedish one would work with lower egalitarian ambitions, which would reduce the need for "a nominal room" and allow greater relative-wage flexibility. The answer hinges on whether the attempts at evening out the wage distribution are endogenous to a centralized system. The fact that the trend toward wage equalization in Sweden was broken around 1983/84 (Figure 8), at the same time as there was a transition to industry-level bargaining might be taken as an indication of this. Rowthorn (1992) also found that centralized bargaining seems to go hand in hand with low wage dispersion. The Austrian experience of combining highly centralized wage setting with substantial wage differentials, however, suggests the possibility of exceptions to this pattern (Flanagan *et al.*, 1983). But the question may be rather academic. Perhaps, centralized wage determination is just not possible in a world where labour becomes more and more heterogeneous and the character of work makes it more necessary to set wages locally in order to provide appropriate incentives for effort (Calmfors, 1991a). The break-down of centralized bargaining in countries like Britain and the Netherlands could also suggest that this system of wage setting may be the outcome of specific historical circumstances rather than a normal state of affairs (Flanagan *et al.*, 1983; and Newell & Symons, 1987).

¹¹ An alternative way of avoiding multi-level bargaining is the German approach, according to which there is no local bargaining round, but where individual employers are instead responsible for the implementation of industry wage agreements at the level of individual firms.

3. General macro policy

If active labour market policy and centralized bargaining were not the main explanations for the low Swedish unemployment in the eighties, what were they then? I shall argue that general macro policies -- fiscal and exchange rate policies -- have been the most important factors.

One can distinguish between two phases in the policies to fight rising unemployment in the seventies and early eighties. In the first phase 1975-80, the main aim was to maintain low unemployment by fiscal and labour market policies that were supposed to accommodate high real wages. The 1976-77 currency devaluations can be seen rather as attempts to compensate for the higher money wage increases than those in other countries in 1974-76 than to reduce real wages in response to the supply shocks and the international recession (Calmfors, 1984). Expansive fiscal policies in order to counteract the fall in employment were not unique at the time, but they were pursued much more vigorously in Sweden than elsewhere (Bosworth & Rivlin, 1987). There were several ingredients: general fiscal reflation (Figure 11), general expansion of public-sector employment (Table 4), the earlier discussed labour market programmes (Figure 3) and selective subsidies to individual firms (which in 1977/78 and 1982/83 amounted to as much as 1.1 and 2.0 percent of GDP respectively).¹²

These policies were not sustainable. They led to a serious weakening of the current account and the government budget position (Figure 12). Both investment and the total savings of the country fell drastically (Figure 13). The expansionary fiscal and labour market policies helped, of course, to hold down unemployment in the short run, but to the extent that the incentives for wage restraint were weakened,

¹² Arbetsmarknadsdepartementets årsbok 1991, p. 153.

these effects are likely to have been counteracted over time by crowding-out effects on private-sector employment (see e.g., Calmfors, 1982, 1984; Calmfors & Horn, 1985, 1986; Hersoug, 1985; Andersen, 1989, 1990; and Calmfors & Nymoen, 1990). Nevertheless, one could argue that the fiscal and labour market policies, unsustainable though they were, did prevent persistence (hysteresis) effects from developing in the late seventies.

Table 4: Change of public-sector employment in percent of labour force (annual average)

1970-75	1975-80	1980-85	1985-90
0.9	0.9	0.4	-0.1

Sources: The National Accounts and the Labour Force Surveys

However, in my view, the main reason why Sweden managed to avoid the general Western European rise in unemployment in the early eighties is likely to have been that the same process of disinflation was not attempted. Instead two major devaluations were made in 1981-82 (Figure 14a). Together with the earlier devaluations in 1976-77 they meant a total depreciation of the effective exchange rate by about 35 percent between 1976 and 1983. In view of all the experience there is of money wage inertia, it appears highly implausible that exchange rate depreciations of this magnitude should not have had a major impact on real wages and the relative cost position in the medium term (see also Gylfason, 1990; or Lindbeck, 1992). Indeed, my previous reasoning would suggest that the 1981-82 situation was an ideal one for devaluations to be effective (which I did not realize at the time): on the one hand the multi-level bargaining may have exacerbated downward money wage

rigidities, on the other hand central wage setters ought to have appreciated the need for real-wage adjustment in response to the supply shocks experienced (Sachs, 1982).

The Swedish devaluations were combined with fiscal restraint in general (Figure 11), a slower expansion of the public sector (Table 4) and a reduced accommodative stance of labour market programmes (Figure 4). This may explain why the nominal exchange rate depreciation was translated into a real exchange rate depreciation of a similar magnitude in 1982-83 (an improvement of the relative unit labour cost position of Sweden, as shown in Figure 14a), and a substantial real-wage adjustment (Table 2). The real-exchange-rate depreciation, which coincided with the general international upturn, was followed by an expansion of output and employment that reduced unemployment gradually (Figures 1 and 2). The government budget position and the current account also improved in the subsequent years (Figure 12), and investment picked up again (Figure 13).

One indication of the importance of the devaluations and the lack of disinflation is that the real-wage adjustment was not brought about through lower money-wage increases than in the sixties and early seventies (Figure 9) but through higher price increases (Figure 10). Similarly, lower money wage increases than abroad made no contribution to the improvement of the relative cost position (Figure 14b) in 1977-83. There is, however, a lack of firm econometric evidence on the interaction between the devaluations and money wage rigidities. One reason is the common practice of estimating real-wage equations which do not allow for asymmetrical money wage rigidities, as discussed in section 2. I would not rule out that the standard empirical result that real wages in Sweden are substantially more sensitive to unemployment than real wages in most other countries is conditional upon a high rate of inflation. Holmlund

(1990) finds some support for this view by excluding observations for the eighties, but Calmfors & Nymoen (1990) and Calmfors & Forslund (1990) do not. The latter, however, find that real wages in the 1983-85(86) period were about 3 percentage points lower than they "ought to be", which could be interpreted as a devaluation effect. Several studies for Sweden and other countries have also found that a reduction of inflation tends to raise real wages temporarily, which should imply that the absence of disinflation ought to have speeded up the adjustment of real wages to higher unemployment in the early eighties as compared to most other Western European countries.¹³

However, the Swedish experience also appears to illustrate clearly the risks attached to a policy of monetary accommodation. As illustrated in Figures 10 and 14b, the rates of both price and wage inflation in Sweden in the eighties remained above the Western European averages. This development culminated in 1989 and 1990 when Swedish wage costs for blue-collar workers increased by 11.2 and 9.1 percent, respectively. This contributed to a steady erosion of the relative-unit-labour-cost position (Figure 14a). Although there is an on-going discussion on the reliability of Swedish productivity data, it appears clear that the deterioration of the competitive situation was further enhanced by slower productivity growth than abroad in the second half of the eighties. This picture emerges both from Figure 14b and Figure 15. A recent study (Hansson et al., 1991) has also found a significantly lower rate of growth of total factor productivity in Sweden than in other OECD

¹³ These studies include i.a. Alogoskoufis & Manning (1988), Calmfors & Forslund (1990, 1991), Calmfors & Nymoen (1990), and Jackman et al. (1991).

countries.¹⁴ It is a common view that insufficient pressure for structural change in a situation when the devaluations had created excess profits may have been an important factor behind this development (Erixon, 1991; Produktivitetsdelegationen, 1991).

The wage inflation in the eighties can be explained in two ways. The first is in terms of a Barro & Gordon (1983a,b) model of the inflationary process, according to which governments with a high preference for employment and which are free to pursue discretionary policies (such as the Swedish ones have been) will end up in an equilibrium with high inflation. Rational wage setters will realize that declarations of anti-inflationary policies are not credible, because such governments always have an incentive to cheat on markets ex post by inflating down the real wage in order to create employment. Wage increases will adjust to these expectations and hence the government has no alternative but to create the inflation that is anticipated. In the Backus & Driffill (1985a,b) or Horn & Persson (1988) interpretations, wage setters are uncertain about the "true character" of the government but may attach a certain probability to high inflation (devaluation). These expectations may lead to money wage increases that raise the actual real wage above the target of wage setters, as long as the government sticks to a policy of low inflation. Such a situation may have developed towards the end of the eighties, because the earlier large devaluations had ruined the credibility of the fixed-exchange-rate target (against a trade-weighted currency basket). The hypothesis receives support from studies of interest rate differentials vis à vis other countries, which

¹⁴ The study has attempted to control for technological catching-up effects.

seem to indicate more or less continuous expectations of exchange rate depreciations (Figure 16a).

A more traditional explanation is that the Swedish economy simply overheated towards the end of the eighties. In the first phase of expansion in 1982-1985, idle resources were put to work and the expansion was concentrated to the tradable sector, as is reflected by the strong contribution of net exports to growth in Table 5. Towards the second half of the eighties, this export-led growth seems instead to have changed into a situation of general competition for resources, where primarily domestic demand increases were responsible for GDP growth. The expansion occurred mainly in the non-tradable sector (Figure 17). For example, Henrekson (1991) has argued that the 1981/82 devaluation had only temporary effects on the relative price and on the relative profitability between tradable and non-tradable sectors. As a consequence of the resulting competition for resources, vacancies were up to 1.1 percent of the labour force, and open and total unemployment (the sum of open unemployment and labour market programmes) down to 1.4 and 2.7 percent, respectively, in 1990.

The main reason for the emergence of demand pressures was not so much expansive fiscal policy per se (see Figure 11), but rather that fiscal policy was not sufficiently restrictive to compensate for the monetary stimulus following the 1985 deregulation of the credit market in a situation when the combination of tax deductability for interest rates on loans, high marginal tax rates and inflation made borrowing very cheap in real terms (Bergman et al., 1990, 1991; and Franzén & Hörngren, 1989). An additional explanation was probably the supply constraints associated with, *inter alia*, high marginal tax rates and generous rules for paid

leave from work, sickness benefits, and early retirement in connection with work injuries (Produktivitetsdelegationen, 1991).

Table 5. Average yearly contributions to GDP growth (in percent of GDP).

	1982-84	1985-87	1988-91
Private Consumption	0.2	1.8	0.7
Public Consumption	0.4	0.4	0.4
Gross Investment	0.4	0.7	0.3
Net Export	1.4	-0.9	-0.1
GDP	2.4	2.0	1.2

Source: Konjunkturinstitutet, Analysunderlag, March 1992.

A more far-reaching question is why politicians allowed an overheating of the economy to develop. One plausible explanation is insufficient constraints on policies. Exchange rate depreciations may have been regarded as an easy way out by politicians as well, thus weakening the incentives to take unpopular decisions at an early stage. It may have been a serious mistake not to try to align the Swedish krona to the EMS immediately after the 1982 devaluation. A decision in this direction was not taken until in the spring of 1991, when the krona was pegged unilaterally to the ECU, which according to Figure 16b seems to have had an immediate - but not completely stable - credibility effect.

Another explanation of why the overheating developed may have to do with the corporatist form of government adopted by the ruling social democratic party in 1982-1991. It may be the case, as has been argued by, e.g., Bruno & Sachs (1985) and others, that corporatist decision-making involving the large wage-earner organizations, may facilitate the

emergence of a consensus on, for instance, real wage moderation in a deep crisis. But it may be equally true that the negotiation costs of reaching agreements could make it harder to prevent a crisis from emerging by making it more difficult to take action at an early stage (Scharpf, 1983). Kjell-Olof Feldt, the social democratic Minister of Finance 1982-1990, has in a very detailed way described how the desire to reach a consensus with the trade union movement -- and need, since the trade unions has been the main financier of the social democratic party -- blocked policy changes, such as a temporary increase of the VAT in 1989 and reductions of government expenditures in order to cool down the economy (Feldt, 1991). The course of action chosen was instead to try to reach corporatist agreements with trade unions on wage restraint in exchange for tax concessions. It has not, however, been possible to trace econometrically any effects of these attempts (Calmfors & Forslund, 1990). Instead it may even have been the case that these concessions, such as the right of individual members to deduct union fees for tax purposes and various subsidies of union activities, increased both the political and bargaining strength of unions with possible adverse effects on both wage setting and the political capacity to make unpopular decisions. It would seem to me that such costs of corporatism have largely been neglected in most of the literature.¹⁵

4. Can Sweden avoid high unemployment in the future?

In the coming years, Sweden's ability to avoid high unemployment will be put to a serious test. Since 1990, unemployment has -- according to Swedish standards -- risen quite dramatically. Today (in May 1992) open unemployment is 4.6 percent, and participation in labour market

¹⁵ In addition to Bruno & Sachs (1985), Schmitter (1981), Olson (1982) and Crouch (1984) are main references.

programmes 3.5 per cent. All forecasts point to substantial further rises in 1992-93. It also appears clear that Sweden, by declaring its intention to join the EC and by pegging the Swedish krona to the ECU, has opted for disinflation. The relevant question is whether this will be possible without similar unemployment rises as have occurred elsewhere. If my analysis above is correct, there appears to be a serious risk that this cannot be avoided.

One policy option is to let higher unemployment put downward pressure on wages, as seems to be the strategy of the present liberal-conservative government. If the wage-setting schedule is indeed as steep as earlier studies have found (see Appendix 1.1), this might seem an easy way out. A substantial real-wage adjustment would occur at the same time as the adverse consequences of unemployment could be mitigated through labour market programmes.¹⁶ According to my reasoning in Section 2, one should not, however, expect the earlier found real-wage flexibility at the low rates of inflation that we are now anticipating. Nor am I convinced that labour market programmes suffice to avoid persistence (hysteresis) effects, if as much as 8-10 percent of the labour force are without regular jobs. Labour market programmes do certainly not influence persistence effects arising from low investment (e.g., Sachs, 1987). I am also sceptical of the view that they reduce insider power to maintain high wages by increasing the potential competition from outsiders (Lindbeck & Snower, 1988; and Löfgren & Wikström, 1991), since the replacement of insiders by outsiders in existing firms remains only a theoretical possibility and the possibilities of the unions to force

¹⁶ Most studies find a log-linear relation between real wages and open unemployment. Hence an expansion of labour market programmes will cost progressively less in terms of reduced downward pressure on wages at higher levels of unemployment.

collective agreements on new firms with unorganized labour are considerable in the Swedish system. Neither can we be certain that labour market programmes are good enough when it comes to maintaining the employability of those that are without regular work for a very long time (see Section 1).

Another policy option would be to try once again to stabilize employment through traditional countercyclical fiscal policies of a Keynesian type, as advocated by the present social democratic opposition. The problem with this approach is the fears in financial markets that a rapidly growing public-sector budget deficit will make a new currency devaluation inevitable. Recent experience provides ample evidence on how such doubts have provoked capital outflows that have necessitated large interest rate rises in order to defend the fixed exchange rate (see Figure 16b). It is a common assesment that the positive demand effects of discretionary fiscal policy action that increases the public-sector deficit would be (more than) off-set by the resulting real-interest-rate increases (e.g., Henrekson et al., 1992).

Are there other policy options? Yes, in my view there are. Sweden starts out with a substantially higher tax ratio than most other countries in Western Europe. There is an emerging consensus that tax rates should be reduced for efficiency reasons. A similar argument applies to the benefits in several transfer systems (e.g. sickness insurance, the insurance for work injuries, the pension system), which are constructed in ways that may provide weak incentives for work (Bergman et al., 1991; and Produktivitetsdelegationen, 1991). This raises the possibility of reducing tax rates in such a way that a real-wage adjustment and a reduction of relative units costs are facilitated. The method would be a reduction of pay-roll taxes that could be financed

either by reduced government transfers to households or increased social security contributions from them (that ought to be directly linked to the social security benefits). The policy combination would affect output and employment in more or less the same way as an exchange rate depreciation: there would be positive supply responses because the reduction of pay-roll taxes lowers wage cost, at the same time as the reduction of transfer payments and/or increase of social security contributions keeps domestic demand in check (see Appendix 3 for a formal demonstration).

The proposal of such an "internal devaluation" hinges, of course, on the assumption that downward money-wage rigidity - and not real-wage rigidity - is the main obstacle to a sufficient real-wage adjustment at the rates of unemployment that we are approaching. In terms of Figure 18, the position of the economy would be a temporary "quasi-equilibrium" like C. The proposal is thus consistent with my hypothesis that the estimates of a large sensitivity of real wages to unemployment may have presupposed that real wages could be lowered without going below a lower floor for money wage increases. If my view is correct, there would seem to be a small risk that the reduction of wage costs due to a reduction of pay-roll taxes is off-set by higher wages. Earlier studies of the incidence of pay-roll taxes (although these have not incorporated the possibility of money wage rigidities) appear also to confirm that there are indeed very substantial effects on wage costs at least in the short run.¹⁷

¹⁷ These studies include Holmlund (1983, 1989, 1990), Bean *et al.*, (1986), Calmfors & Forslund (1990, 1991), and Calmfors & Nymoén (1990). It should be noted, though, that earlier observations relate almost exclusively to rises of pay-roll taxes.

The main risk with the proposed policy would seem to be adverse effects on future expectations. In the Swedish policy debate, the argument has been made that the expectations that the government will always accommodate money wage increases will be strengthened, so that the incentives for future money wage restraint are reduced (Jakobsson, 1991; and Söderström, 1991). This is certainly a potential cost that must be weighed against the potential benefit of avoiding that a large unemployment rise causes persistence effects.

One can, however, point to several factors that may reduce the adverse effects on expectations. First, there are obvious limits to how large such an internal devaluation can be because of the difficulties of shifting social security contributions to households and/or reducing government expenditures. A substantial cut of pay-roll taxes (say by 6-8 percentage points) is difficult to repeat. The argument against the proposal would therefore have to be that the future credibility of exchange rate policy is undermined. One should then keep in mind that a reduction of pay-roll taxes tends to reduce prices and therefore to reduce the rate of inflation temporarily. Furthermore, this policy measure does not, like an external devaluation, mean that the government reneges on its earlier announced policy commitments. Reduced pay-roll taxes ought thus not to communicate the same information on policy-makers' relative preference with respect to inflation and unemployment as an exchange rate depreciation: indeed, the adverse effects on inflationary expectations ought to be considerably smaller. Finally, expected future membership in the EC and the EMS (EMU?) may provide Sweden with a "credibility bonus" that could further reduce the risks.

An additional problem has to do with the time lags involved. It may take time for the profit increase following a cost reduction to raise

investment demand. But the decrease of real disposable income for workers that would result from increased social security contributions or lowered government transfers is likely immediately to reduce private consumption. As a result there may be a negative short-run impact on labour demand, although the long-run effect is bound to be positive. This might be considered problematic in a situation where one wants to avoid persistence effects. However, it may be more important to achieve a quick reduction of unemployment in the subsequent upswing than to avoid a short-term increase. The introduction of more flexible employment contracts, allowing, e.g. fixed-term contracts, is one possible measure that could speed up the employment response.¹⁸ Another theoretical solution to the problem outlined would be to accept a temporary increase of the public-sector deficit by lowering pay-roll taxes first and making the expenditure cuts and increases of social security contributions later. If interest-rate increases are to be avoided, such a policy commitment must, however, be regarded as credible, which may not be so easy to achieve.

My judgment is that the benefits of a combination of reduced pay-roll taxes and government expenditures (or increased social security contributions from households) are likely to outweigh the costs. The Western European unemployment experiences illustrate the dangers of launching an unconditional non-accommodating policy ex post in a disequilibrium situation which has arisen because the institutional constraints on politicians and wage setters were not there ex ante. My argument is instead that there should be a "soft launching" of non-accommodating policies and that the institutional preconditions must be

¹⁸ See, e.g., Bentolila & Saint-Paul (1992) for an evaluation of the Spanish experience of more flexible employment contracts.

created pari passu with this policy change. Some steps in this direction have already been taken. They include preferential tax treatment for profit-sharing arrangements in order to increase money wage flexibility and labour market reforms designed to weaken the relative bargaining strength of unions such as the abolished tax deductability for union dues, less government subsidization of union activities, and higher fines for wildcat strikes. Additional measures may involve the creation of a link between individual contributions to the unemployment insurance system and the actual costs for unemployment compensation, further moves away from multi-level bargaining, stricter rules for strikes in the public sector that threaten vital interests in society, an abolishment of the legal bargaining monopoly that unions today have for both members and non-members in many areas, and a reduction of the possibilities of unions to use the conflict weapon in order to force employers with unorganized labour to sign collective agreements etc. Moves in the direction of entering the EMS (EMU) and an associated strengthening of the independence of the Swedish central bank may be important steps in order to increase the credibility of anti-inflationary policy.

Is the new liberal-conservative government in Sweden likely to follow the policy advice on reduced pay-roll taxes? The answer is probably no. The 1981-82 devaluations are today generally regarded as a mistake in Sweden, because they are seen as a major explanation of why more fundamental policy changes were postponed (e.g., Bergman et al., 1991; Henrekson, 1991; and Produktivitetsdelegationen, 1991). I agree that the magnitude of the devaluations was probably far too large, but in my view there is also an unfortunate tendency in Sweden to forget about how the employment record has differed from that of most other Western European countries.

The main strategy of the present government seems to be to create an environment favourable to long-term growth through privatization of part of the public sector, structural reforms of transfer systems, and a combination of general tax reductions (mainly VAT decreases in order to achieve a "harmonization" in relation to the EC countries) and more specific ones affecting small firms, savings and wealth. At the same time, open unemployment is to be held down through a large expansion of labour market programmes (where government-paid "youth traineeships" with low pay in the business sector instituted in 1992 represent an innovation). The policy strategy could perhaps best be described as Thatcherism plus a dose of traditional Swedish labour market policy. If it works, it might be a wonderful combination, but I remain sceptical. I see a great risk that the fall in employment becomes so large and prolonged that persistence effects cannot be avoided. Although present projections point to a substantial lowering of Swedish relative unit labour costs in 1992-93 (mainly because of expected productivity increases), my fear is that Sweden may end up with a highly efficient business sector, but one that will be too small to generate low unemployment.

5. Conclusions

My main point is that the importance of labour-market policy and centralized wage bargaining for the earlier low Swedish unemployment is likely to have been exaggerated. It is hard to find time-series evidence in favour of the great benefits of Swedish labour market policy that have been claimed. Rather, it seems that overambitious policies may at times have contributed to wage pressure. The main advantage may have been that Sweden has avoided a system with long duration of passive unemployment

benefits. As to centralized wage bargaining, it may require inflation in order to deliver the real wage moderation predicted by conventional theory. Instead, the main factor behind the earlier employment record of Sweden may have been general macro policy and that Sweden in the eighties did not attempt the same disinflation as most EC countries. The other side of the coin is that Sweden now appears to be on its way towards much higher rates of unemployment than in the past as a determined effort to converge on the lower inflation rates of the EMS countries is being made.

What could Western Europe learn from the Swedish macro experience? I see four main lessons.

(i) Although the effects of labour market policy should be expected to be much more favourable in situations with high unemployment, research on Sweden seems to warn against expecting too much. It might also be interpreted to point to the need for significantly lower remuneration in programmes than in regular work, very explicit targeting on the long-term unemployed and built-in search activities, as well as the need to combine more active labour market policy with institutional changes that reduce the maximum duration of unemployment benefits in many countries.

(ii) The case for more centralized bargaining does not seem as clear-cut as is often claimed. A necessary precondition for more coordinated bargaining to deliver real-wage restraint appears to be that multi-level bargaining is avoided.

(iii) General macro policy may after all be more important than seems to have been believed in recent years. Demand management in order to counteract large shocks may still have a role to play (coarse instead of fine tuning). In the eighties Sweden provided a good example of the virtues of preventing high unemployment from arising.

(iv) Sweden is, however, also a good example of how insufficient constraints on policies may lead to too expansive demand policies setting off wage increases that are inconsistent with long-run inflation targets. This is presumably the type of process that can be avoided in a European Monetary Union with an independent central bank (Eurofed) with price stability as its main responsibility.

A conclusion that should not be drawn from the Swedish experience is that Western Europe should try quickly to inflate itself out of the present situation with high unemployment. We know from the literature on unemployment persistence that once such a situation has occurred, highly expansive policies are likely to result in inflation and/or real wage rises rather than in increases of employment (e.g., Blanchard & Summers, 1986, 1987; Lindbeck & Snower, 1988; or Jackman et al., 1991). If the "investment" in credible non-inflationary policies has already been made, one must probably take care to maintain this credibility, but this ought to be consistent with a careful demand expansion over time. Indeed, it is hard to see how the persistent unemployment in Western Europe could be broken in reasonable time without a move in this direction. Only in interaction with such policies, would one expect training programmes in order to increase the employability of the long-term unemployed and other measures to facilitate the absorption of outsiders in the labour market (such as stimulating the entry of new firms and extending the scope of more flexible employment contracts) to make more substantial contributions.

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Figure 1: Unemployment (percent of labour force)
in Sweden and Western Europe

Source: OECD Economic Outlook, June 1992

Here as in later diagrams Europe represents an unweighted average for Austria, Belgium, France, West Germany, Italy, the Netherlands and the United Kingdom.

Figure 2: Long-term unemployment in Sweden as a percentage of open unemployment

Sources: The Central Statistical Office and the National Labour Market Board

Figure 3: Labour market programmes and total unemployment (percent of labour force)

Sources: The Central Statistical Office and the National Labour Market Board

Figure 4: Accomodative stance of labour market policies: labour market programmes in relation to total unemployment (open unemployment plus programme participation)

Sources: The Statistical Office and the National Labour Market Board

Figure 5: The equilibrium in the labour market

Figure 6: The conventional Beveridge curve, 1962–91: the relationship between vacancies and open unemployment in per cent of labour force

Figure 7: The revised Beveridge curve, 1962–91: the relationship between vacancies and total unemployment (the sum of open unemployment and labour market programmes) in percent of labour force

Figure 8: Wage dispersion in Sweden (development of coefficient of variation)

Source: The Swedish Employers' Federation

Figure 9: Wage drift, central wage increase and total money wage cost increase in percent (the LO-SAF area)

Source: The Swedish Employers' Federation

Figure 10: Inflation (changes of the consumer price index in percent) in Sweden and Western Europe

Sources: OECD Historical Statistics and OECD Main Economic Indicators

Europe represents an unweighted average for Austria, Belgium, France, West Germany, Italy, the Netherlands and the United Kingdom.

Figure 11: The contribution of fiscal policy to GDP growth (in percent of GDP)

Source: Ministry of Finance

Figure 12: The current account and public-sector net lending in percent of GDP

Sources: The Swedish Central Bank and the Central Statistical Office

Figure 13: Gross investment and gross savings as percent of GDP

Sources: The Central Statistical Office and the National
Bureau of Economic Research

Figure 14a: The effective exchange rate and relative unit labour cost
(average 1970–74=100)

Source: The Swedish Employers' Federation

Figure 14b: Relative wage cost per hour and relative productivity
(average 1970–74=100)

Source: The Swedish Employers' Federation

Figure 15: Labour productivity in manufacturing (1973=100)

The OECD countries are Belgium, Canada, Denmark, France, West Germany Italy, Japan, the Netherlands, the United Kingdom and the United States.

Sources: Monthly Labour Review (the OECD countries), the Industrial Statistics and the National Accounts (Sweden)

Figure 16a: Spot and future expected exchange rates for the Swedish crown

Source: Svensson (1991)

The krona spot exchange rate and the expected 12-month, 24-month and 60 month exchange rates are expressed in currency index units. A higher index indicates a weaker krona. The exchange rate band is between 130 and 134 index units. The expected future rates have been calculated from interest differentials.

Figure 16b: Spot and future expected exchange rates for the Swedish krona

Source: The Swedish Central Bank

The krona spot exchange rate and the expected 3-month, 6-month and 12-month exchange rates are expressed in currency index units. A higher index indicates a weaker krona. The exchange rate band is between 130 and 134 or 7.29 and 7.51 index units, respectively. The expected future rates have been calculated from interest differentials.

Figure 17: Employment growth in different sectors (1980=100)

Source: The Central Statistical Office

Industry refers to mining, manufacturing, electricity, gas and water.
Private services refer to the rest of the private sector.

Figure 18: Money wage rigidities

APPENDIX1. The impact of labour market policy1.1 Studies of wage setting

The wage equations referred to in the text have usually been derived from one of the two following formulations of the long-run relationship.

$$(1) \quad \ln w = \alpha_0 + \alpha_1 u + \alpha_2 r + \dots$$

$$(2) \quad \ln w = \beta_0 + \beta_1(r+u) + \beta_2 \gamma + \dots ,$$

where w = the real wage, u = open unemployment as a percentage of the labour force, r = labour market programmes as a percentage of the labour force, and $\gamma = r/(r + u)$ = accommodative stance. A lower downward wage pressure from programmes than from open unemployment means that $\alpha_1 < \alpha_2$ in (1) and that $\beta_1 < 0$ and $\beta_2 > 0$ in (2). If all results are translated into equations like (1), the typical finding is that $-12 < \alpha_1 < -5$, i.e. a one percentage point increase in open unemployment reduces the real wage in the long run by 5-12 per cent (with most studies in the middle of the interval). Some of the studies find $\alpha_2 = 0$, which means that labour market programmes are perfect substitutes for regular employment from the point of view of wage formation (a fall of regular employment that is perfectly offset by an expansion of programmes, so that open unemployment remains constant, has no effect on wages). But several of the studies also find $\alpha_2 > 0$.

One potential problem with the estimates is that of simultaneity bias if programmes respond to the general employment situation (and thus to wages) according to a policy reaction function. One should expect this to be a smaller problem if γ is used as an explanatory variable than

if r is, since a given γ means that r will automatically respond to a change in $r+u$. However, results do not differ systematically depending upon whether current or lagged labour-market policy variables have been used. Nor does it seem to matter whether the studies are based on aggregate time series or on pooled time series and cross-section data, where in the latter case wages for sub-groups of workers are related to aggregate labour-market variables. The only studies that have attempted to exploit the cross-sectional variations in labour market programmes are Nilsson (1987), Skedinger (1991), Östros (1991) and Edin et al. (1992). The three first confirm the results of the other studies. Edin et al. (1992) is the only one that has so far reached the conclusion that labour market programmes reduce wage pressure ($\alpha_2 < 0$ in equation (1)).

1.2. The Beveridge curve

The 'revised' Beveridge curve in the text can be derived as follows. Assume a constant-returns-to-scale hiring function, according to which the number of hirings H depends upon the number of vacancies V and the total number of job seekers (the openly unemployed U and the number of participants in labour market programmes R , where the latter are weighted by their search intensity relative to the openly unemployed c). Hirings are thus given by

$$(3) \quad H = h(V, U + cR). \quad h_1 > 0, h_2 > 0$$

Assume furthermore that a representative employee quits with probability q . Hence the total number of quits is

$$(4) \quad Q = qN,$$

where N = employment. In steady-state equilibrium hirings must equal quits, i.e.

$$(5) \quad h(V, U + cR) = qN.$$

Dividing by the labour force M , letting $v = V/M$, $u = U/M$, $r = R/M$ and $n = N/M$, one obtains

$$(6) \quad h(v, u + cr) = qn,$$

or since $n = 1 - r - u$

$$(7) \quad h(v, u + cr) = q(1 - r - u),$$

which can be rewritten

$$(7a) \quad h(v, (r + u) + (c - 1)r) = q(1 - r - u).$$

Since implicit differentiation of (7a) with respect to $r + u$ and v (holding r constant) gives $d(r + u)/dv = du/dv = -h_1/(h_2 + q)$, the equation defines a negatively sloped Beveridge relationship between $r + u$ and v . To see how the relationship is affected by labour market programmes, I differentiate (7a) with respect to $r + u$ and r (holding v constant) and obtain

$$(8) \quad \frac{d(r + u)}{dr} = - \frac{h_2(c - 1)}{h_2 + q}.$$

It is immediately seen that $d(r + u)/dr \lesseqgtr 0$ depending upon whether $c \gtrless 1$. The revised Beveridge curve in Figure 7 thus shifts to the left, when labour market programmes expand, if the relative search effectiveness in labour market programmes is larger than in open unemployment and vice versa.

Jackman et al. (1990) have estimated the following curve for Sweden for 1971-88.

$$(9) \quad \ln u = -0.32 - 0.87 \ln v + 0.001 \ln u_{-1} - 0.04t - 0.02\tilde{\gamma},$$

(1.0) (4.0) (0.01) (3.6) (2.0)

where in addition to earlier symbols t = a linear time trend and $\tilde{\gamma}$ is a lagged unweighted average. Both u and $\tilde{\gamma}$ are measured in percent. In a steady state differentiation of (9) with respect to u and r (both measured in percent) gives

$$\frac{du}{u} \approx - \frac{2dr}{(r+u)} + \frac{2rdr}{(r+u)^2} + \frac{2rdu}{(r+u)^2},$$

or if we evaluate the expressions at the period averages $u = 2.0$ and $r = 1.9$

$$(10) \quad \frac{d(r+u)}{dr} \approx 0.$$

An expansion of labour market programmes has thus according to the Jackman et al. (1990) estimation, a zero effect on the revised Beveridge curve. Or equivalently, the conventional Beveridge curve shifts by precisely the amount that programmes have expanded, since $du/dr = -1$ from (10). This is consistent with $c=1$ in (1), i.e. equal search effectiveness in open unemployment and in programmes.

This result is confirmed by a similar regression for the period 1964-89:¹⁹

$$(11) \quad (r+u) = 5.17 - 2.99v + 0.51(r+u)_{-1} + 0.006\tilde{\gamma},$$

(2.30) (9.00) (6.23) (0.17)

$$\bar{R}^2 = 0.930, \quad LM(1) = 1.69, \quad LM(2) = 2.25$$

where $\tilde{\gamma} = (\gamma_{-1} + \gamma_{-2})/2$ and r , u and γ are again measured in percent.

¹⁹ The estimate is maximum likelihood with AR(1) disturbances.

2. Different forms of bargaining

Consider an economy consisting of a number of identical firms that are price takers in the world market. The wage w_i in a representative firm is determined so as to maximize the Nash bargaining product

$$(12) \quad B = (u_i - u_o)^\alpha (\pi_i - \pi_o)^{1-\alpha},$$

where u_i is the utility of a representative firm-specific union, π_i the real profit of the firm, and u_o and π_o the fall-back positions (which I interpret as the utility levels in case of a labour market conflict) of the union and the firm, respectively. Union utility is increasing in the own wage and decreasing in the wage of others, i.e. wage jealousy effects, as emphasized by e.g. Oswald (1979) and Gylfason & Lindbeck (1984), are assumed to be important. More specifically, I let

$$(13) \quad u_i = \frac{w_i}{\bar{w}^\beta}, \quad 0 < \beta < 1$$

where the aggregate wage

$$(14) \quad \bar{w} = \frac{1}{m} \sum_{j=1}^m w_j$$

is the average of all individual wages and m the number of firms.

The real profit of the representative firm is

$$(15) \quad \pi_i = Y_i - w_i L_i,$$

where Y_i is the output and L_i the employment of the representative firm.

The production function is

$$(16) \quad Y_i = F(L_i, K_i), \quad F_1 > 0, F_2 > 0, F_{11} < 0, F_{22} < 0$$

where K_i is the (fixed) capital stock of the representative firm. The production function is assumed to exhibit constant returns to scale and

to have the property that the elasticity of substitution between capital and labour is smaller than unity, which means that an increase of the real wage rate w_i will always raise labour's share of value added $w_i L_i / Y_i$.

The firm determines employment after the wage has been set. Ordinary profit maximization then gives

$$(17) \quad w_i = F_1(L_i, K_i).$$

2.1. Bargaining at one level only

I first compare different degrees of centralization when bargaining takes place at one level only. Since I assume no outside income support during a labour market conflict in a firm, it is natural to let $u_0 = \pi_0 = 0$. The Nash bargaining product (12) then becomes

$$(12a) \quad B = \left(\frac{w_i}{\bar{w}} \right)^{\alpha} (Y_i - w_i L_i)^{1-\alpha}.$$

The bargained wage is obtained by differentiating (12a) with respect to w_i taking (14), (16) and (17) into account. I allow for different degrees of centralization by assuming that the (same) wage is set for f firms in each bargain, where $1 \leq f \leq m$. The first-order condition for a maximum becomes

$$(18) \quad \mu = \alpha \cdot \frac{1}{w_i} - \alpha \beta \phi \cdot \frac{1}{\bar{w}} - (1-\alpha) \frac{L_i}{Y_i - w_i L_i} = 0,$$

where $\phi = f/m$. The condition states that the marginal benefit to the union of a wage increase (the first term) must balance the marginal cost to the union because the aggregate wage increases (the second term) and the profit decrease to the firm (the third term). In a symmetric

equilibrium where $w = w_j$, $Y = Y_j$ and $L = L_j$ for all j , one can derive from (18) that

$$(19) \quad w = \alpha \cdot \frac{Y}{L} \cdot \frac{(1-\beta\phi)}{(1-\alpha\beta\phi)}.$$

With completely decentralized bargaining to individual firms $\phi = 1/m \approx 0$ if m is sufficiently large. This is like treating the aggregate wage $\bar{w}$ as exogenous. Hence

$$(19a) \quad w \approx \alpha \frac{Y}{L},$$

i.e. the real wage bill is approximately equal to a fraction (given by the exponent of union utility in the Nash bargaining product) of value added. With more centralized bargaining, i.e. when $\phi > 0$, the wage bill will make up a smaller fraction of value added, since $(1-\beta\phi)/(1-\alpha\beta\phi) < 1$. With complete centralization, i.e. when $\phi = 1$, one obtains

$$(19b) \quad w = \alpha \cdot \frac{Y}{L} \cdot \frac{(1-\beta)}{(1-\alpha\beta)}.$$

It follows immediately from the assumption that the elasticity of substitution between capital and labour is smaller than unity that a lower wage share implies a lower wage. Hence an increase of the degree of centralization reduces the wage. The intuition is that the marginal cost to the individual union of a given wage rise increases, the more firms that are encompassed by the bargain (the aggregate wage increases more).

2.2. Multi-level bargaining

In a two-level bargaining system, where central bargaining is followed by bargaining at the firm level, central wage setters must take

the subsequent local wage increases (wage drift) into account. It is assumed that local bargaining takes place under a formal peace clause, and that workers receive the centrally agreed real wage q during a local wage dispute. Hence $u_0 = q$. But the firm may suffer a profit loss because of informal "go-slow-actions" etc. and in this case only receives the real profit π_0 . Hence, the outcome of local bargaining is the real wage that maximizes

$$(20) \quad B = \left[\frac{w_i}{\bar{w}} - \frac{q}{\bar{w}} \right]^\alpha [Y_i - w_i L_i - \pi_0]^{1-\alpha} =$$

$$= \frac{1}{\bar{w}^\alpha} [w_i - q]^\alpha [Y_i - w_i L_i - \pi_0]^{1-\alpha},$$

taking (17) into account, and treating $\bar{w}$ as exogenous. If we again drop subscripts, the first-order condition for a maximum gives

$$(21) \quad w = \frac{\alpha(Y - \pi_0)}{L} + (1-\alpha)q.$$

The real wage set at the local level can be written as the sum of wage drift d (in real terms) and the central contract real wage, i.e. $w = q + d$. Hence drift is given by

$$(22) \quad d = \frac{\alpha(Y - \pi_0)}{L} - \alpha q.$$

Since $\alpha < 1$, drift does not off-set central wage changes completely. As a consequence, central wage setters control the final real wage outcome. If they want to achieve the wage given by (19b), they must set q so that

$$(23) \quad \alpha \cdot \frac{Y}{L} \cdot \frac{(1-\beta)}{(1-\alpha\beta)} = \frac{\alpha(Y - \pi_0)}{L} + (1-\alpha)q,$$

which gives

$$(24) \quad q = \frac{\alpha\pi_0}{1-\alpha} - \frac{\alpha\beta}{1-\alpha\beta} Y$$

We can derive from (22) that $d = \alpha(\pi - \pi_0)/(1-\alpha)L$. It follows that $\pi > \pi_0$ is the condition for positive wage drift, i.e., $d > 0$. A firm, of course, agrees to a local wage increase only if the resulting profit is larger than the profit in the case of a local conflict. As the model has been set up, this outcome is more likely the lower is π_0 and the higher is β , i.e., the more important wage jealousy effects are (in which case the central wage setters will strive for a low real wage).

The central contract real wage as can be written $q = W_{-1}(1+a)/P_{-1}(1+\hat{p})$, where W = the money wage, a = the central money wage increase, P = the price level, $\hat{p}$ = the rate of price increase, and the subscript indicates the (past) time period. In Section 2 of the text the argument is that there may be a money wage rigidity restriction, so that $a \geq \tilde{a}$, where $\tilde{a} \geq 0$. Hence if $\hat{p}$ is small, it may be impossible for central wage setters to set as low a q as they wish (the q given by (24)). If so, it follows from (21) or (22) that their real-wage target will not be met: wage drift does not make the reasonable assumption that $\pi_0 = \pi_0(q)$ with $\partial\pi_0/\partial q < 0$, i.e., that profits during a local dispute are negatively related to the central contract wage, wage drift may not fall at all. Such a result has been derived in a slightly different model by Holden (1990a, b, 1991) and Moene et al. (1991). The counterpart here is to let

$$(25) \quad \pi_0 = Y_0 - qL_0,$$

where Y_0 = output and L_0 = employment during a local conflict. Substitution of (25) into (22) gives

$$(26) \quad d = \frac{\alpha(Y-Y_0)}{L} + \alpha\left(\frac{L_0}{L} - 1\right)q.$$

In the special case when $L_0 = L$, it follows that

$$(27) \quad d = \frac{\alpha(Y-Y_0)}{L} > 0,$$

if $Y > Y_0$, i. e. there will always then be wage drift if output is reduced during a local conflict.

2.3. The determination of employment

The assumption above has been that firms determine employment after the wage has been set. Moene (1988), Holden (1988) and Moene et al. (1991) instead assume that employment has to be determined before wages. In the latter case, using (18b), one can write the profit of the individual firm under decentralized bargaining at the firm level only as

$$(28) \quad \begin{aligned} \pi_i &= F(L_i, K_i) - w_i L_i = F(L_i, K_i) - \frac{\alpha F(L_i, K_i) L_i}{L_i} = \\ &= (1-\alpha)F(L_i, K_i) \end{aligned}$$

It follows that the employment level L_i should be chosen so that $F_1(L_i, K_i) = 0$. Under bargaining at the central level only, the individual firm takes w_i as given and chooses L_i as usual so that $w_i = F_1(L_i, K_i)$. Hence decentralized bargaining at the local level gives higher employment than centralized bargaining in this case. The same will hold when workers receive some income $\tilde{w}$ during a conflict, in which case the profit-maximum condition under decentralized bargaining becomes $\tilde{w} = F_1(L_i, K_i)$, provided that $\tilde{w} < w$ where w is then the wage under centralization.

3. The equivalence between external and "internal" devaluations

Consider a standard model with traded and non-traded goods (see e.g. Helpman, 1977; Calmfors 1978; Rødseth 1979; or Andersen, 1989). The model can be summarized by the following equations.

$$(29) \quad X = S_T(w_T) - D_T(\tilde{P}_N, \tilde{Y})$$

$$(30) \quad S_N(w_N) - D_N(\tilde{P}_N, \tilde{Y}) = 0$$

$$(31) \quad N = N_T(w_T) + N_N(w_N) + N_G$$

$$(32) \quad w_T = \frac{W(1+\tau)}{eP_T^*}$$

$$(33) \quad w_N = \frac{W(1+\tau)}{P_N}$$

$$(34) \quad \tilde{P}_N = \frac{P_N}{P_T}$$

$$(35) \quad \tilde{Y} = \frac{(1-t)Y + G + (1-t)WN_G - \tau W(N_T + N_N)}{eP_T^*}$$

$$(36) \quad Y = P_T S_T(w_T) + P_N S_N(w_N)$$

$$(37) \quad tY + \tau W(N_T + N_N) - (1-t)WN_G - G = 0$$

The symbols are S_T = supply of traded goods, D_T = demand for traded goods, X = net exports, S_N = supply of non-traded goods, N = total employment, N_T = employment in the traded-goods sector, N_N = employment in the non-traded goods sector, N_G = employment in the government sector, w_T = the product real wage in the traded-goods sector, w_N = the product real wage in the non-traded goods sector, $\tilde{P}_N$ = the relative price

between non-traded and traded goods, $\tilde{Y}$ = the real disposable income of households measured in traded goods, Y = the nominal value of private-sector output, W = the money wage, P_T^* = the foreign-currency price of traded goods, P_N = the price of non-traded goods, e = the exchange rate, τ = the payroll tax rate, t = the income tax rate and G = nominal government transfers to households.

The equations should be self-explanatory. (29) is the market equilibrium condition for traded goods, which since domestic firms are assumed to be price takers in the world market simply determines net export as the difference between domestic supply and demand. (30) defines market equilibrium for non-traded goods. (31) expresses total employment as the sum of employment in the traded-goods, the non-traded goods and the government sectors. (32)-(36) are definitions of variables. (37) is the government budget restriction. I first assume the pay-roll tax rate τ , the income tax rate t and government employment N_G to be exogenous, so that nominal transfer payments G are determined endogenously so as to assure a balanced budget.²⁰

Noting that $\tilde{P}_N = P_N/P_T = (W/P_T)/(W/P_N) = w_T/w_N$, the system can (after substituting (37) into (29) and (30) be written:

$$(29a) \quad X = S_T(w_T) - D_T\left(\frac{w_T}{w_N}, S_T(w_T) + \frac{w_T}{w_N}S_N(w_N)\right)$$

²⁰ Note that I have implicitly assumed that the goods produced by the government sector are distributed at a zero price, and that the utility function of a representative individual is additively separable in the consumption of private-sector and government-sector goods, so that the demand for traded and nontraded goods does not depend upon government-sector output.

$$(30a) \quad S_N(w_N) - D_N\left(\frac{w_T}{w_N}, S_T(w_T) + \frac{w_T}{w_N} S_N(w_N)\right) = 0$$

$$(31) \quad N = N_T(w_T) + N_N(w_N) + N_G$$

$$(37a) \quad t\left(S_T(w_T) + \frac{w_T}{w_N} S_N(w_N)\right) + \tau w_T(N_T(w_T) + N_N(w_N)) - \\ - (1-t)w_T N_G = g,$$

where in addition to the earlier symbols $g = G/P_T$. The system can now be analyzed very simply if we assume that the money wage W and the foreign price P_T^* are exogenously given, and that the exchange rate e and the pay-roll tax rate τ are policy parameters. We can assume the government to control the product real wage $w_T = W(1+\tau)/eP_T^*$ through these parameters. To analyze the effects of a given reduction of w_T , we need only solve (30a) for the product real wage in the non-tradable sector and then substitute into (29a), (31) and (37a). It is immediately obvious that the effects on employment (and net exports) do not depend upon how the reduction of w_T comes about. Using the market-equilibrium condition $S_N = D_N$ and the Slutsky decomposition (according to which $D_{1N} = D_{1N}^* - D_N D_{2N}$, where numbers in subscripts denote partial derivatives with respect to the i :th argument, D_{1N} = the (total) price effect and D_{1N}^* = the pure substitution effect), and choosing units of measurements so that $w_N = w_T = 1$ initially, differentiation of (30a) gives

$$(38) \quad \frac{dw_N}{dw_T} = \frac{\begin{matrix} (-) & (+) & (-) \\ D_{1N}^* & + & D_{2N} S_{1T} \end{matrix}}{\begin{matrix} D_{1N}^* & + & S_{1N}(1-D_{2N}) \\ (-) & (-) & (+) \end{matrix}} > 0.$$

Independently of how the product real wage in the traded-goods sector is reduced, a given reduction thus decreases the product real wage in the non-traded goods sector in the same way. Hence output and employment in both sectors and total employment increase. It is thus wrong, as is sometimes asserted, that an "internal devaluation" would stimulate the non-traded goods sector more than an external devaluation because pay-roll taxes are reduced throughout the economy. A reduction of the pay-roll tax rate is also equivalent to an external devaluation if we instead of G let the income tax rate t respond endogenously so as to ensure budget balance. However, the equivalence no longer holds if we instead let government employment N_G vary so as to balance the government budget. Although the effects on the product real wage in the non-traded goods sector and thus on the output and employment levels in the two sectors are still equal, it follows from (37a) that government employment (and hence also total employment) must always be lower in this case.