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EFFECTS OF EXTENDED UNEMPLOYMENT COMPENSATION IN SWEDEN*

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1. Introduction

Many labor market models predict that an increase in unemployment pay causes higher unemployment, and a considerable amount of empirical research has aimed at testing and quantifying the presumed relationship. These studies have typically focused on a particular aspect of unemployment, for example the duration of unemployment or the flow into unemployment through layoffs. The empirical research has in general found some behavioral impact of unemployment compensation, but the results have been rather diverse with respect to estimates of the quantitative effects. (For a survey, see Björklund and Holmlund (1986).)

This paper takes a new look at the Swedish experience of extended unemployment compensation. There are several reasons for our interest in this subject. The Swedish unemployment insurance (UI) system has successively become much more generous over the past decades, and there are substantial time series variations in variables that capture unemployment compensation. In this study we exploit this information along with time series on unemployment outflow rates. There is also a need to find a satisfactory explanation for the rise in unemployment duration in Sweden. As is seen in Table 1, there has been a trend increase in unemployment duration, a similar trend increase in the unemployment rate, but no corresponding increase in

Table 1 The Incidence and Duration of Unemployment, Sweden 1965-86.

	All unemployed				Members of UI funds	Non-members
	Age 16-64			Age 55-64		
	u	f	D	D	D	D
	(1)	(2)	(3)	(4)	(5)	(6)
1965-69	1.8	.265	6.8	14.2	10.8	7.6
1970-74	2.2	.191	11.5	24.2	16.0	10.7
1975-79	1.9	.165	11.5	23.9	14.9	11.5
1980-84	2.9	.187	15.5	38.8	16.6	16.5
1985-86	2.7	.174	15.5	42.2	16.3	17.2

Notes: u is the unemployment rate, f is the weekly inflow into unemployment as a percentage of the labor force, and D is the average duration of completed unemployment spells. (We have used the relation $u=f \cdot D$ to calculate D, using data on u and f.)

unemployment inflow. The rise in unemployment duration is quite dramatic for workers over the age of 55.

The paper begins with an overview of important features and extensions of the Swedish UI-system. In Section 3 we discuss the theoretical framework, and Section 4 presents the data. The results of

our econometric work are set out in Section 5, and Section 6 offers some evidence on changes in search effort. Section 7 concludes the paper.

2. The Basic Facts

Unemployment Insurance

The Swedish UI-system is organized through a number of certified UI funds with voluntary membership and close ties to the trade unions. In fact, for most purposes a UI fund can be regarded as an integral part of a trade union. It is possible to be a member of the UI fund without being a union member, but membership in the fund is compulsory for union members.

The UI funds are subject to various government regulations. The government decides on a range of permissible benefit levels among which the funds can choose; the funds have typically preferred the maximum benefit level, but some dispersion in granted benefit levels across funds do exist. The funds' revenues are covered in part by membership fees and in part by government subsidies. The subsidies have increased substantially over time and account at present for more than 90 percent of the expenses.

UI compensation is paid for 5 days per week according to a

granted daily benefit level ("tillförsäkrad dagpenning"). There is, however, a waiting period of one week before benefits are paid out. Benefits have been considered as taxable income since 1974. The eligibility requirements include a "membership requirement" stating that a claimant must have paid membership dues to the UI fund for at least 12 months prior to the claim. There is also a "work requirement", stating that the worker must have been employed for at least 5 months during the 12 months preceding the unemployment spell.

In order to receive unemployment compensation, the worker must be registered as a job seeker at the employment office, and an offer of "suitable" work must be accepted. If a "suitable" offer is turned down, benefits can be denied for 4 weeks; further denials may occur if offers are repeatedly turned down. Manpower training programs may in some cases be regarded as "suitable" work, and the same holds for temporary jobs (relief work) provided by the Labor Market Board. The disqualification rules also apply to workers who are dismissed for failure to perform their jobs and those who quit into unemployment.

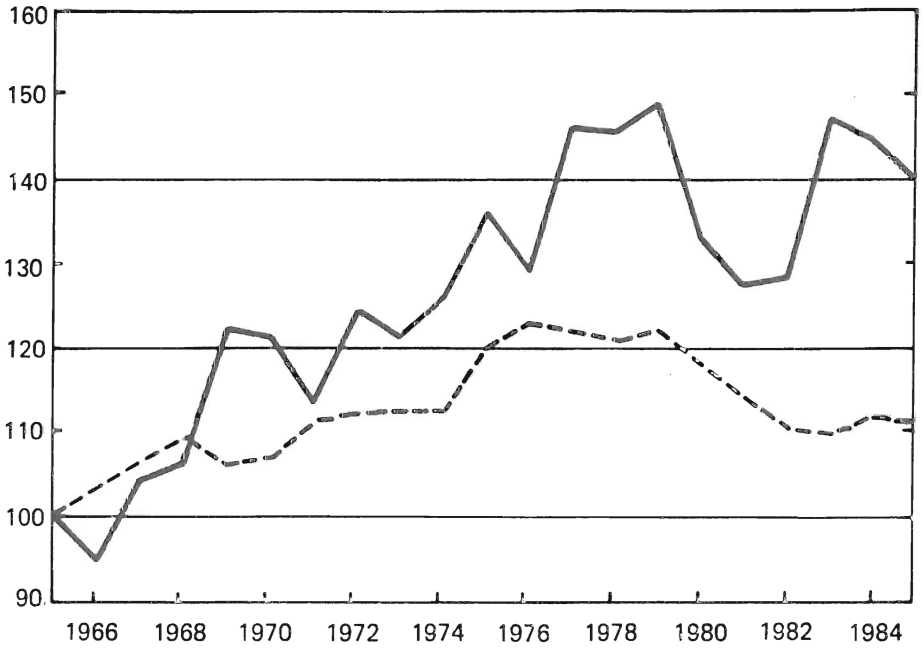
The maximum duration of unemployment pay has increased over time. The maximum benefit period for workers under the age of 55 was 150 days (30 weeks) until 1974, and has been 300

days since 1974. Workers over 55 can, since 1974, receive benefits for 450 days (90 weeks). Before 1968 their maximum period was only 150 days; as of July 1, 1968 the benefit period was extended to 450 days for all unemployed over the age of 60, and for some unemployed over 55.[1/]

New rules for early retirement have implied additional extensions of the maximum benefit periods. From January 1974 those over age 60 who have received UI benefits (or "cash assistance" as described below) for 450 days have been entitled to early retirement, even in the absence of health problems. (More generous rules for early retirement were introduced for workers over age 63 as early as 1972.)

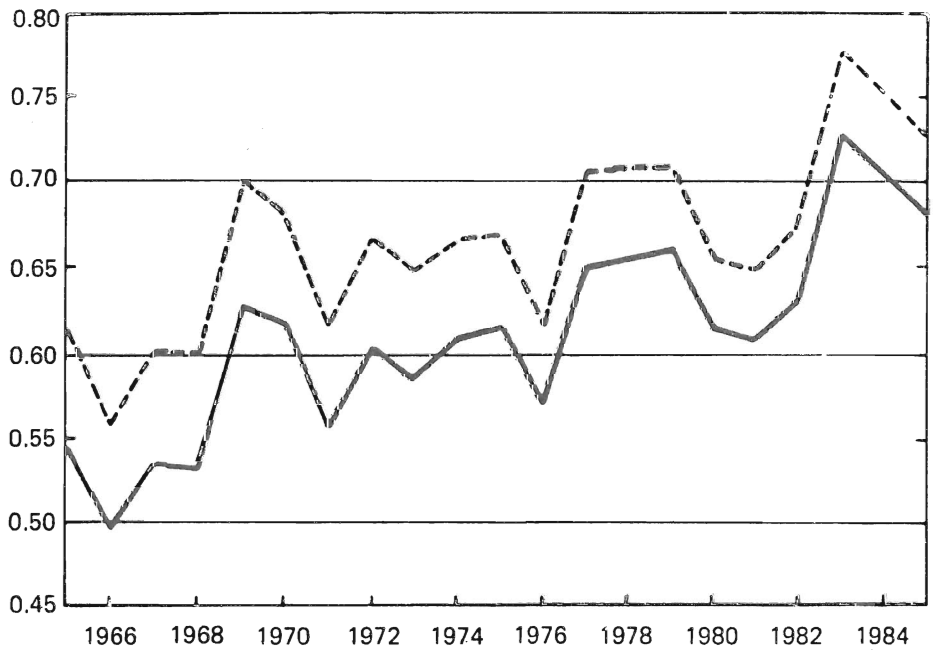
Real benefits for qualified members of UI funds have increased faster than real wages. Figure 1 shows the development of real after-tax benefits (average granted benefits), and weekly real after-tax earnings for a blue-collar worker in mining and manufacturing. Real wages increased by only 10 percent between 1965 and 1985, but real after-tax benefits increased by around 40 percent. This implies a trend increase in the replacement ratio, i.e., the ratio of net income when unemployed to net income when employed. Figure 2 displays two series, one relevant for a worker with average blue-collar earnings (referred to as the replacement ratio for an employed worker), and one

Figure 1. Real benefits (solid) and real wages (dashed), 1965-1985.



Source: Own calculations.

Figure 2. Replacement ratios for employed workers (solid) and unemployed workers (dashed), 1965-1985.



Source: Own calculations.

relevant for a worker with an unemployed worker's hypothetical earnings (referred to as the replacement ratio for an unemployed worker). The latter series is calculated by using separate wage series for males, females and teenagers, and using the groups' shares of unemployment as weights. The series in Figure 2 disregard the one week waiting period, and may be regarded as marginal replacement ratios; they show the ratio between income if unemployed next week and income if employed that week.

We have not had access to information on benefits actually received by unemployed workers. The data we use are hypothetical constructs, and should be treated with caution especially as far as the levels of the replacement ratios are concerned. The series should hopefully capture the time series variations with reasonable accuracy, and this is most important for our purposes.

Cash Benefits (KAS)

The UI eligibility requirements imply that a substantial number of unemployed persons do not receive "regular" unemployment pay. A complementary system, called cash benefits (kontant arbetsmarknadsstöd, KAS), was introduced in 1974. To qualify for KAS, a work or a schooling requirement must be fulfilled. The former requires 5 months of work within the last 12 months, and the latter requires

12 months of full time studies above the compulsory level or 5 months in labor market training. A special qualifying period of 3 months is required for those who have left school. KAS can be paid out for 150 days; workers above age 55 (60) can receive KAS for 300 days (450 days). However, until July 1, 1984 those over 60 could receive benefits until age 65.

KAS compensation is treated as taxable income, but the benefit levels are much lower than those of the UI funds. KAS-benefits have on average amounted to 30 percent of UI-benefit levels during the period 1974-85. The rules about registration at employment offices and requirements to accept "suitable jobs" are basically the same for KAS recipients.

Compensated and Uncompensated Unemployment

Many unemployed workers do not qualify for any unemployment benefits at all. It is noteworthy that among all unemployed individuals, 30 to 40 percent did not receive any compensation during 1978-85. There is a clear trend decline in the number of persons without compensation, but 30 percent has neither UI nor KAS. The share of unemployed workers without compensation falls with age, KAS has been more frequent among young workers, and the short-term unemployed are more likely to lack compensation than those

who have been unemployed for a longer time. (For further details, see Björklund and Holmlund (1986).)

Membership in the UI funds has increased substantially over the past two decades. This has also implied that a growing fraction of unemployment has been covered by regular unemployment compensation. The labor force surveys contain information on whether unemployed people are members of UI funds or not. Most unemployed members of UI funds are likely to receive benefits, although some groups are excluded by the waiting time rules, the work requirement, and the special rules pertaining to voluntary quits and refusal to accept "suitable" work. There has been a remarkable increase in UI coverage from 25 percent in the mid-60s to over 60 percent in the mid-80s.

In conclusion, it is clear that unemployment compensation in Sweden has become successively more generous since the mid-60s. There have been (i) increases in the length of the maximum benefit periods, and (ii) a marked trend increase in UI coverage, (iii) replacement ratios have shown an upward trend, and (iv) a new type of benefit (KAS) has been introduced. It would be rather surprising if all these changes have occurred without any impact on labor market behavior. There are several routes whereby the incentive effects may operate, and we now turn to a discussion of some of these.

3. Theoretical Framework

Our study focus on the relationship between unemployment benefits and unemployment duration, but there are of course other mechanisms through which benefits can affect unemployment. Researchers in the U.S. have often placed considerable emphasis on the role of subsidized UI when explaining the frequency of temporary layoffs. (See for example Topel (1983).) Temporary layoffs are however very few in Sweden, so that mechanism cannot be important. Recent work on wage setting models in Britain and the Scandinavian countries has pointed out that unemployment benefits may affect wage bargaining outcomes.[2/] However, it seems as if research on the incentive effects of UI is dominated by the duration aspects.

The basic content of the microtheory of labor market search is by now wellknown, but it might be useful to summarize some major points. The standard model portrays an unemployed individual searching for acceptable offers. The worker's objective is often taken to be maximization of lifetime income, but may in more general models be maximization of lifetime utility. In the simplest model, the worker draws in each period a wage offer from an exogenous and known wage offer distribution. If the job is accepted, the individual works at the accepted wage forever. Optimal behavior is characterized by a reservation

wage rule that separates acceptable offers from unacceptable ones. If the escape rate from unemployment is denoted by μ, the offer distribution by $F(\cdot)$ and the reservation wage by w^*, we have

$$\mu = 1 - F(w^*). \tag{1}$$

It is straightforward to show that the worker's reservation wage is increasing in the benefit level, so a higher benefit level will reduce the escape rate (increase the duration of unemployment) through a lower acceptance probability.

There are, however, other and perhaps more important routes whereby benefits may influence the pace at which workers exit from unemployment. The impact on search effort is one example. Indeed, it seems quite plausible that workers may have to search for job openings per se, rather than just having to choose (at a fixed search cost) between "good" and "bad" offers. There is thus a case for incorporating endogenous search effort into any model that attempts to capture the real world. Such models have been worked out, and they predict - as should be expected - that an increase in the benefit level reduces the worker's optimal search effort. (Albrecht, Holmlund and Lang (1986).) It is natural to think in terms of a function that generates offers, and

we denote this function by $\theta(\cdot)$; it may be interpreted as the probability of receiving an offer during a short time interval. The function $\theta(\cdot)$ is increasing in search effort (s), and it may be influenced by various other characteristics (Z) specific to the individual or the labor market. The exit rate thus takes the form

$$\mu = \theta(s,Z)[1-F(w^*)], \tag{2}$$

and both search effort and the reservation wage are now endogenous choice variables, influenced by variables like unemployment benefits but also by variables in the Z-vector. For example, an improvement in the worker's labor market - a larger flow of offers or a rightward shift of the offer distribution - will in general affect both search effort and the reservation wage. A common empirical procedure expresses Eq. (2) as a reduced form equation where the choice variables are substituted out, and this is also how we proceed.

Real world UI systems have typically a fixed maximum duration for benefit payments; we noted above that the Swedish system now involves benefit exhaustion after 60 or 90 weeks. A rise in the maximum length of benefit payments can be expected to have effects similar to those produced by a rise in the benefit level; the escape rate is likely

to fall as workers become more choosy or reduce their search effort. UI systems with a fixed maximum duration period may also produce falling reservation wages over the spell of unemployment, and therefore lead to "positive duration dependence"; the probability of leaving unemployment would then increase as the duration of the spell increases. Although newly laid-off workers will raise their reservation wages when the benefit level is increased, it can also be shown that workers close to benefit exhaustion will reduce their reservation wages when the benefit level is raised. Workers take future separation probabilities into account in their job acceptance decisions, and a higher benefit level makes it therefore more advantageous to have a job; workers near the end of the benefit period react by becoming less choosy. (Mortensen (1977) as well as Burdett (1979) deal with these issues.)

Research on incentive effects of UI has also paid some attention to "entitlement effects". How does a higher benefit level affect the behavior of unemployed individuals for whom unemployment compensation is not available? Search theory predicts that higher benefits will make it more attractive to accept offers and thereby qualify for benefits in the future. Unemployment duration should therefore fall among individuals not entitled to benefits.

In the Swedish context, this may be relevant for new entrants to the labor market who do not receive regular UI compensation or KAS.

In conclusion, our short review has shown that search theory has implications for time series movements in escape rates.[3/] The theory also predicts duration-specific effects of UI benefits. Movements in escape rates should thus be related to variables that capture (i) the probability of receiving a job offer, (ii) income when unemployed as well as expected income when employed, and (iii) the maximum duration of unemployment pay.

We choose the aggregate vacancy-unemployment ratio, V/U, to capture the searcher's probability of receiving an offer; this probability can reasonably be assumed to increase in the number of job openings and decrease in the number of workers competing for the available jobs.[4/] We also include the ratio between after-tax benefits and after-tax earnings, i.e., the replacement ratio, R. The implied restriction is thus that equiproportional increases in benefits and expected earnings do not affect escape rates. To account for the increases in the maximum benefit periods (1968 and 1974), we use two dummy variables, D68 and D74.

We choose the logistic functional form and write the basic

specification as

$$(3) \qquad \ell n \frac{\mu}{1-\mu} = \alpha_0+\alpha_1(V/U)+\alpha_2 R+\alpha_3 D68+\alpha_4 D74.$$

A time trend is added to this equation in order to check how robust the estimates are. The equations are estimated on quarterly data from the mid-60s to 1985, using dummies to account for seasonal variations. Information on V/U is readily available from published sources, but this is not true for series on escape rates. The next section describes how we have obtained the time series.

4. The Data

The unemployment variable refers to the total number of unemployed individuals according to the labor force surveys (AKU). The vacancy statistics are collected by the employment offices and published by the National Labor Market Board (AMS). The data are produced as an integral part of the administrative procedures used at the offices, and are sensitive to changes in these procedures and other institutional rules. Compulsory notification of vacancies was introduced during the period 1976 to 1980. This might motivate some correction of the data in order to ensure comparability over time. We have however not undertaken such corrections, since other changes may have offset the effects of compulsory notification. For example, the demand

for labor during the 80s has shifted towards more skilled workers, and such vacancies have traditionally been less frequently reported to the employment offices. This development may lead to an underestimation of the number of vacancies during the 80s. The past two decades have also seen a trend increase in labor market policy measures, which probably are not reflected in the official vacancy statistics. This is also likely to lead to an underestimation of the number of "true" vacancies facing unemployed workers. Finally, when comparing the vacancy series with other measures of unsatisfied demand for labor, such as series on shortage of labor in manufacturing, there is no evidence of significant effects of compulsory notification.[5/]

The Swedish labor force suveys are designed so that almost 90 percent of those interviewed in one survey are interviewed again three months (13 weeks) later. This is reflected in our computations of escape rates. (Björklund (1978) and Björklund and Holmlund (1981) also exploited this feature of the data.) We denote the number of unemployed workers at least a weeks but less than or equal to b weeks at time t by $U_t^{a,b}$, and the weekly inflow into unemployment by F, and define the following expressions:

$$(4) \qquad U_t^{1,13} = F \sum_{i=0}^{12} (1-\mu_1)^i$$

$$(5) \qquad U_{t+13}^{14,26} = U_t^{1,13}(1-\mu_2)^{13}$$

$$(6) \qquad U_{t+13}^{27,39} = U_t^{14,26}(1-\mu_3)^{13}$$

From these expressions it is most straightforward to calculate the escape rates for the medium-term (μ_2) and long-term unemployed (μ_3) as follows:

$$(7) \qquad \mu_2 = 1 - \left| \frac{U_{t+13}^{14,26}}{U_t^{1,13}} \right|^{1/13}$$

$$(8) \qquad \mu_3 = 1 - \left| \frac{U_{t+13}^{27,39}}{U_t^{14,26}} \right|^{1/13}$$

Given the design of the Swedish labor force surveys, the estimates of μ_2 and μ_3 are thus based on a comparison of the status of almost the same individuals at two points in time.

The escape rate for the short-term unemployed (μ_1) cannot be calculated in the same way. We have instead calculated the escape rate implied by the ratio between the number of unemployed up to 2 weeks and the number of unemployed up to 13 weeks:

$$(9) \qquad \frac{U^{1,2}}{U^{1,13}} = \frac{1-(1-\mu_1)^2}{1-(1-\mu_1)^{13}}$$

Note that $U^{1,2} = F \sum_{i=0}^{2} (1-\mu_1)^i$. When (9) was estimated we picked $U^{1,2}$ three months before $U^{1,13}$. Even if the same individuals do not appear in the numerator and the denominator, the discrepancy is likely to be small.

5. Estimation Results

The first set of regressions pertain to all unemployed individuals in a given duration category. Some of these individuals have regular UI benefits, some have KAS, and quite a few have no benefit income at all. The aggregate, duration-specific, escape rate is then explained by an aggregate replacement ratio, capturing movements in benefit levels as well as the upward trend in UI coverage. It takes the form

$$(10) \qquad \bar{R} = \alpha_1 RUI + \alpha_2 RKAS$$

where RUI and RKAS are replacement ratios for UI and KAS (using the unemployed worker's expected earnings as denominator), α_1 is the fraction of unemployment that is covered by regular UI, and α_2 is the fraction that is covered by KAS. (Note that $\alpha_1+\alpha_2<1$ because of the fact that a substantial fraction of unemployed workers do not receive any compensation at all.)

The estimation results are presented in Table 2. Ordinary least squares (OLS) and weighted least squares (WLS) produce similar estimates of the parameters as well as their standard errors.[6/] As is seen, the V/U ratio always enters with a positive and significant sign. This finding holds for most duration and worker categories considered in this study. Turning then to benefit effects, it is clear from Table 2 that the significance and magnitude of the relevant coefficients are sensitive to the inclusion or exclusion of a time trend in the regressions. When the trend is excluded, the estimated coefficients for the replacement ratio as well as the dummy variables that purport to capture extensions of the benefit periods (D68 and D74) are negative (rows 3, 8 and 13). The only exception is the positive (although insignificant) shift in 1974 for the long term unemployed. Some of the negative coefficients are however estimated rather imprecisely.

When the time trend is included in the regressions, some of the benefit coefficients change from negative to positive signs. Our estimates are thus somewhat shaky despite the substantial variations in the replacement ratio variable. To the extent that the time trend captures factors other than a more generous benefit system, the results suggest that the major extensions of UI have occurred without adverse incentive effects.

Table 2 Escape rate equations for all unemployed. (t-statistics in parentheses)

	Estim. techn.	Const.	V/U	$\bar{R}$	D68	D74	Trend	$\bar{R}^2$	DW
Short-term unemployed (μ_1) (1965.2-1985.4)									
1	OLS	-1.687	0.785	-1.144	-	-	-	0.530	1.63
		(-8.09)	(5.46)	(-2.38)					
2	OLS	-2.092	0.585	2.360	-	-	-0.015	0.556	1.77
		(-7.88)	(3.57)	(1.52)			(-2.36)		
3	OLS	-1.685	0.785	-0.563	-0.220	-0.002	-	0.533	1.70
		(-6.56)	(5.41)	(-0.60)	(-1.58)	(-0.01)			
4	OLS	-1.980	0.479	2.890	-0.174	0.237	-0.020	0.569	1.88
		(-7.35)	(2.67)	(1.86)	(-1.29)	(1.45)	(-2.71)		
5	WLS	-1.774	0.372	2.326	-0.189	0.173	-0.018	-	-
		(-7.27)	(2.32)	(1.63)	(-1.49)	(1.24)	(-2.63)		
Medium-term unemployed (μ_2) (1965.2-1985.4)									
6	OLS	-1.636	0.391	-1.617	-	-	-	0.747	1.79
		(-19.10)	(6.61)	(-8.17)					
7	OLS	-1.909	0.255	0.745	-	-	-0.010	0.791	2.14
		(-18.71)	(4.06)	(1.25)			(-4.15)		
8	OLS	-1.797	0.414	-0.727	-0.058	-0.154	-	0 765	2.03
		(-17.65)	(7.19)	(-1.96)	(-1.06)	(-2.71)			
9	OLS	-1.925	0.281	0.774	-0.038	-0.050	-0.009	0.788	2.19
		(-18.20)	(3.99)	(1.27)	(-0.73)	(-0.78)	(-3.00)		
10	WLS	-1.908	0.277	0.855	-0.046	-0.043	-0.009	-	-
		(-17.86)	(4.05)	(1.39)	(-0.83)	(-0.70)	(-3.12)		
Long-term unemployed (μ_3) (1965.3-1985.4)									
11	OLS	-2.357	0.444	-1.087	-	-	-	0.396	1.62
		(-16.20)	(4.24)	(-3.21)					
12	OLS	-2.407	0.416	-0.644	-	-	-0.002	0.389	1.62
		(-12.40)	(3.26)	(-0.55)			(-0.39)		
13	OLS	-2.236	0.439	-1.215	-0.172	0.121	-	0.417	1.71
		(-12.81)	(4.24)	(-1.88)	(-1.72)	(1.22)			
14	OLS	-2.367	0.322	0.092	-0.150	0.187	-0.007	0.418	1.72
		(-12.08)	(2.45)	(0.08)	(-1.49)	(1.58)	(-1.32)		
15	WLS	-2.179	0.283	0.009	-0.232	0.139	-0.007	-	-
		(-12.55)	(2.50)	(0.01)	(-2.45)	(1.36)	(-1.42)		

Which quantitative effects are implied by the estimates in Table 2? Suppose that we take the regressions without the trend as our preferred equations, assuming that the estimated coefficients for $\bar{R}$, D68 and D74 do capture the impact of extended unemployment compensation. We then obtain what can reasonably be regarded as an estimate of the maximum impact. Table 3 presents such calculations for two alternatives. The first alternative, displayed to the left in the table, shows the estimated escape rates as well as the number of unemployed persons in different duration categories implied by these estimates for the benefit system prevailing in 1986. The second alternative, to the right in the table, shows the estimated escape rates and the number of unemployed persons for the benefit system prevailing in 1965; the dummy variables are thus set to zero and the aggregate replacement ratio of 1965 is applied. The V/U ratio of 1986 (0.34) was used in both these alternatives. We estimated the weekly inflow to unemployment to 7500 persons.

Consider first the predicted escape rates. It is clear that the implied decline in escape rates is much stronger for the medium-term unemployed than for the other categories. In terms of the number of unemployed persons (in all duration categories up to 39 weeks) there is an implied increase from around 67 000 to 84 000, or an increase by

Table 3 Estimated effects of extended UI benefits on escape rates and number of unemployed. Effects implied by equations 3, 8 and 13 in Table 2

Predicted values with aggregate replacement ratio = 0.48, shifts 1968 and 1974, V/U = 0.34.		Predicted values with aggregate replacement ratio = 0.20 no shifts 1968 and 1974, V/U = 0.34.	
escape rates (yearly averages)		escape rates (yearly averages)	
$\hat{\mu}_1$	0.093	$\hat{\mu}_1$	0.107
$\hat{\mu}_2$	0.085	$\hat{\mu}_2$	0.124
$\hat{\mu}_3$	0.061	$\hat{\mu}_3$	0.087
Number of unemployed 1-13 weeks[a]		Number of unemployed 1-13 weeks[a]	
	57 985		53 995
Number of unemployed 14-26 weeks[b]		Number of unemployed 14-26 weeks[b]	
	18 270		9 660
Number of unemployed 27-39 weeks[c]		Number of unemployed 27-39 weeks[c]	
	8 060		2 960

a) $F\Sigma_{i=0}^{12}(1-\hat{\mu}_1)^i = \hat{U}_t^{1,13}$ where F = 7500

b) $\hat{U}_t^{14,26} = \hat{U}_t^{1,13}(1-\hat{\mu}_2)^{13}$

c) $\hat{U}_t^{27,39} = \hat{U}_t^{14,26}(1-\hat{\mu}_3)^{13}$

around 25 percent.[7/] This effect is not negligible, but it should be noted that Swedish unemployment has doubled during the period 1965-86. Our estimate thus suggests that extended UI has not been a major factor behind the trend increase in unemployment and unemployment duration.

We also run separate regressions on data for more homogenous groups, such as different age-groups and members and non-members of UI funds. The replacement ratio variable for members (RALL) is obtained by using the employed worker's earnings as denominator, since members of UI funds on average are older than non-members. The benefit variable for non-members is a weighted KAS replacement ratio (RKAS), where the weights are obtained from the fraction of unemployment days covered by KAS.

Estimation results for prime-aged insured workers are set out in Table A1 in the Appendix. Strong significant UI-effects are difficult to find, but the signs are typically as expected for the short-term and the medium-term unemployed. It is surprising that there is no shift in 1974 for the long-term unemployed, given that the benefit period was extended from 30 to 60 weeks at this time. Turning to the results for prime-aged non-members (Table A2 in the Appendix), we note the KAS-replacement ratio in most cases appears with a negative sign.

We noted in the descriptive overview that the maximum

benefit periods for members over 55 were extended in 1968 as well as in 1974. In addition, the early retirement scheme of 1974 implied stronger incentives to remain unemployed during the whole benefit period. Our estimation results for medium-term unemployed in this category (Table A3 in the Appendix) show strong and robust effects of extended UI. The coefficient for the replacement ratio is negative and significant even when the time trend is included, and the 1974-dummy has negative coefficients in all specifications. The message provided by the results for the short-term unemployed in this group is less clear, but this regression performs quite poorly. (We suspect that the data on escape rates for the short-term unemployed are unreliable in some cases.)

Do these adverse effects on escape rates reflect a reduced flow into employment or a fall in the propensity to exit from the labor force? It might be that the effects to a considerable degree capture changes in registration behavior. The extension of the benefit periods have certainly reduced the incentives to withdraw from the labor force, and increased the incentives to remain unemployed and registered at the employment offices. Some findings by Heikensten (1984) support such an interpretation of our results. Heikensten used micro-data from the labor force surveys of 1975-79 and decomposed the exit rate into

transitions to employment and transitions out of the labor force. He explored the effect of membership in UI funds on these transitions and found that UI fund members had significantly lower probabilities of leaving the labor force; the probability of moving from unemployment to employment was, however, not significantly affected by UI fund membership.

6. Evidence on Search Effort

Search theory suggests that unemployment benefits can affect unemployment duration via reduced search intensity, and this motivates a look at the time-series movements in some key indicators of search effort. An unemployed respondent in the Swedish labor force surveys is asked to inform about his search activities last week. Several alternatives are possible, including employment office, advertisements, direct contacts with employers, and combinations of these alternatives. A remaining category ("other methods") include mainly those individuals who are temporarily laid-off (permitterade) or are waiting to start a job within 30 days.

A crude indicator of search effort is obtained by calculating the average number of search methods used by unemployed individuals. Table 4 presents some basic information. Marked changes in the pattern of job search

Table 4 Search methods used by unemployed workers.

	(1) Fraction using one method	(2) Fraction using two methods	(3) Fraction using three methods	(4) Fraction with no search at all[a)]	(5) Fraction using employment office	(6) Average number of methods used	(7) Average number of methods used*)
Members of UI-funds							
1963-66	.76	.13	.02	.09	.82	1.05	1.15
1967-70	.81	.07	.01	.11	.83	.99	1.11
1971-74	.77	.10	.02	.11	.84	1.01	1.13
1975-78	.82	.09	.02	.07	.89	1.08	1.16
1979-82	.76	.15	.05	.04	.92	1.21	1.26
1983-86	.78	.14	.06	.02	.95	1.23	1.26
Non-members							
1963-66	.66	.13	.01	.20	.52	.96	1.20
1967-70	.69	.12	.02	.17	.56	.99	1.19
1971-74	.71	.16	.03	.10	.69	1.13	1.26
1975-78	.76	.15	.03	.06	.74	1.15	1.22
1979-82	.73	.18	.05	.04	.80	1.25	1.30
1983-86	.72	.17	.08	.03	.85	1.29	1.33

a) This is basically an "others" category, but it includes some temporarily laid-off with salary plus unemployed who were awaiting to start a job within 30 days.

*) Excluding (4)

Note: The three search methods asked about are (i) to visit employment offices, (ii) to answer advertisements and (iii) to contact employers.

Source: Labor Force Surveys, Statistics Sweden.

have taken place since the mid-60s. First, the fraction of unemployed who search via the employment offices has increased. Almost all UI fund members have searched via the employment offices during the entire period, so the increase is due to the non-members. The introduction of KAS has presumably increased the incentives to search via the employment offices; in fact, benefit recipients have been required to visit the employment offices in order to be eligible for KAS or regular UI benefits. KAS as well as the growth of UI coverage may therefore have contributed to an increase in search effort among unemployed persons.

The fraction using more than one search method has increased over time; this holds both for members of UI funds and for non-members. There is also a decrease in the fraction that claims that they are not searching at all. This need not necessarily reflect a higher propensity to search actively; those who are waiting to start working at a job they have found are included in this category. When the duration of unemployment increases - as it has in Sweden during the past two decades - the fraction of "wait unemployment" may well fall.

An indicator of search intensity can be calculated in different ways. One measure counts those with no reported search as non-searchers; a second measure excludes the

non-searchers. The reason for the second alternative is the desire to avoid the possibility that a fall in wait unemployment might raise the measure of search effort. Irrespective of which measure one prefers, the basic message is that unemployed workers' search effort has increased over the period 1963-86. This upward trend is to a substantial degree attributable to the fact that workers outside the UI funds have become more inclined to register at the employment offices. Even though strong conclusions are unwarranted, this development might explain why the marked extensions of UI have had relatively moderate effects on unemployment duration.

7. Concluding Remarks

The past two decades have seen substantial extensions of unemployment compensation in Sweden. There have been increases in benefit periods, a trend increase in UI coverage, an upward trend in replacement ratios, and a new type of benefit has been introduced. The same period has also seen a trend increase in the duration of Swedish unemployment. There is little doubt that the fall in labor demand is a major reason behind this increase in duration, but other forces seem to have been in operation as well. The extended UI is an obvious candidate, and this is the topic we have concentrated on.

We use a simple search-theoretical framework as a guide for model specification. The framework suggests how the probability of leaving unemployment is related to variables affecting the probability of finding job offers as well as the probability of accepting them. Improvements of UI - either as a higher benefit level or as an extended benefit period - are likely to make workers more choosy and decrease the pace at which workers escape from unemployment. (There are however exceptions to this prediction, as was noted in the discussion above.)

By and large, our results indicate that extended UI have had some incentive effects in the expected direction. The particular estimates are however imprecise in most cases, and they offer little ground for strong conclusions. We have exploited the best available time series data, but it may well be the case that sharper estimates can be obtained from longitudinal micro-data. It is notable that similar studies of time series movements of escape rates, such as the paper of Pissarides (1986), also find small and imprecisely estimated UI effects. It is quite likely that measurement errors in the replacement ratio variable contribute to these results.

The estimated unemployment effects of unemployment compensation may appear small in light of the marked

extensions of the system. We have offered one possible explanation for this, namely increased search intensity among the unemployed. For example, non-members of UI funds have increasingly been searching via the employment offices. Other explanations are conceivable, and the rapid expansion of labor market programs deserves particular attention. Unemployment-increasing tendencies have been met by expansions of manpower training programs and temporary public jobs, and such measures may be taken as endogenous in a "political model" of the Swedish labor market. One may reasonably conjecture that the active labor market policy has counteracted the effects of extended unemployment compensation.

Footnotes

1. The National Labor Market Board (AMS) could allow extended benefit periods if unemployment was caused by a firm closure or permanent reduction of personnell at a firm.

2. See Oswald (1985) for a survey of trade union models, Layard and Nickell (1986) for empirical results pertaining to Britain, and Holmlund (1987) for results for Sweden.

3. Note that the expected duration of unemployment equals the inverse of the escape rate. Mortensen (1986) offers a discussion of the virtues of using data on escape rates in empirical work on search models.

4. We have used a similar specification in an earlier study (Björklund and Holmlund, 1981). Whether or not vacancies and unemployment should enter the regression in ratio form cannot be determined from theory. A recent study of unemployment outflow in Britain by Pissarides (1986) finds however strong empirical evidence for the ratio representation.

5. The National Institute of Economic Research (Konjunkturinstitutet) undertakes a Business Tendency Survey of manufacturing and construction each quarter.

6. The weights are the usual logit weights, taking into account the fact that there have been some changes over time in the size of the samples of the labor force survey.

7. The increase would have been only slightly higher if unemployment lasting longer than 39 weeks had been included, the reason being that the number of unemployed persons in this category is a very small fraction of Swedish unemployment.

APPENDIX

Table A1 Escape rate equations for unemployed 25-54 years old who are members of UI funds. (t-statistics in parentheses)

	Estim. techn.	Const.	V/U	RALL	D68	D74	Trend	$\bar{R}^2$	DW
Short-term unemployed (μ_1) (1965.2-1985.4)									
1	OLS	−0.567	0.383	−3.041	-	-	-	0.118	1.92
		(−0.48)	(1.11)	(−1.70)					
2	OLS	−0.548	0.386	−3.084	-	-	0.0001	0.107	1.92
		(−0.35)	(1.01)	(−1.06)			(0.02)		
3	OLS	−0.068	0.389	−4.026	-	0.175	-	0.112	1.93
		(−0.05)	(1.13)	(−1.75)		(0.68)			
4	OLS	−0.634	0.178	−2.462	-	0.450	−0.011	0.109	1.94
		(−0.41)	(0.42)	(−0.83)		(1.07)	(−0.83)		
5	WLS	−0.490	0.308	−1.71	-	0.495	−0.019	-	-
		(−0.50)	(1.12)	(−0.90)		(1.82)	(−2.32)		
Medium-term unemployed (μ_2) (1966.1-1985.4)									
6	OLS	−1.541	0.396	−1.219	-	-	-	0.324	2.09
		(−3.59)	(2.85)	(−1.87)					
7	OLS	−2.255	0.288	0.424	-	-	−0.006	0.351	2.16
		(−4.09)	(1.97)	(0.41)			(−2.01)		
8	OLS	−2.007	0.400	−0.302	-	−0.164	-	0.343	2.18
		(−4.02)	(2.92)	(−0.36)		(−1.76)			
9	OLS	−2.246	0.311	0.359	-	−0.047	−0.004	0.343	2.17
		(−4.04)	(1.90)	(0.34)		(−0.32)	(−0.98)		
10	WLS	−2.209	0.357	0.481	-	−0.011	−0.006	-	-
		(−4.17)	(2.50)	(0.48)		(−0.09)	(−1.55)		
Long-term unemployed (μ_3) (1970.2-1985.4)									
11	OLS	−4.518	0.842	2.365	-	-	-	0.211	1.87
		(−3.75)	(2.64)	(1.30)					
12	OLS	−4.201	0.900	1.566	-	-	0.003	0.200	1.88
		(−2.97)	(2.59)	(0.61)			(0.44)		
13	OLS	−4.131	0.816	1.584	-	0.152	-	0.204	1.90
		(−3.10)	(2.53)	(0.74)		(0.70)			
14	OLS	−4.171	0.796	1.711	-	0.172	−0.001	0.190	1.90
		(−2.93)	(1.99)	(0.66)		(0.54)	(−0.09)		

Table A2 Escape rate equations for unemployed 25-54 years old who are not members of UI funds. (t-statistics in parentheses)

	Estim. techn.	Const.	V/U	RKAS	D68	D74	Trend	$\bar{R}^2$	DW
Short-term unemployed (μ_1) (1965.2-1985.4)									
1	OLS	-2.008	0.927	-13.72	-	-	-	0.257	1.78
		(-7.38)	(2.90)	(-2.64)					
2	OLS	-2.001	0.923	-13.48	-	-	-0.0002	0.248	1.78
		(-5.02)	(2.49)	(-1.25)			(-0.03)		
3	OLS	-2.009	0.919	-15.52	-	0.071	-	0.248	1.78
		(-7.33)	(2.81)	(-1.25)		(0.16)			
4	OLS	-1.979	0.897	-14.99	-	-0.090	-0.001	0.238	1.78
		(-4.72)	(2.25)	(-1.10)		(0.18)	(-0.10)		
5	WLS	-1.800	0.620	-9.516	-	0.021	-0.0003	-	-
		(-6.68)	(2.52)	(-1.14)		(0.08)	(-0.04)		
Medium-term unemployed (μ_2) (1965.4-1985.4)									
6	OLS	-2.146	0.584	-7.770	-	-	-	0.408	1.90
		(-20.17)	(4.48)	(-3.88)					
7	OLS	-1.876	0.421	1.158	-	-	-0.009	0.448	2.03
		(-12.72)	(2.99)	(0.29)			(-2.56)		
8	OLS	-2.147	0.610	-3.762	-	-0.159	-	0.407	1.94
		(20.16)	(4.57)	(-0.79)		(-0.93)			
9	OLS	-1.875	0.420	1.099	-	0.003	-0.009	0.441	2.03
		(-12.08)	(2.75)	(0.22)		(0.02)	(-2.35)		
10	WLS	-1.767	0.350	1.398	-	0.048	-0.010	-	-
		(-12.56)	(2.64)	(0.32)		(0.31)	(-2.94)		
Long-term unemployed (μ_3) (1970.1-1985.4)									
11	OLS	-2.653	0.748	-2.587	-	-	-	0.402	2.14
		(-23.86)	(5.40)	(-1.19)					
12	OLS	-2.566	0.700	-0.779	-	-	-0.002	0.394	2.14
		(-12.58)	(4.16)	(-0.19)			(-0.51)		
13	OLS	-2.665	0.722	-5.676	-	0.136	-	0.398	2.15
		(-23.70)	(5.06)	(-1.29)		(0.81)			
14	OLS	-2.533	0.641	-3.723	-	0.172	-0.003	0.394	2.15
		(-12.25)	(3.59)	(-0.73)		(0.98)	(-0.76)		
15	WLS	-2.474	0.699	-3.283	-	0.116	-0.003	-	-
		(-11.76)	(4.32)	(-0.67)		(0.74)	(-0.74)		

Table A3 Escape rate equations for unemployed over 55 years who are members of UI funds. (t-statistics in parentheses)

	Estim. techn.	Const.	V/U	RALL	D68	D74	Trend	$\bar{R}^2$	DW
Short-term unemployed (μ_1) (1965.4-1985.4)									
1	OLS	-2.106	0.517	-0.774	-	-	-	0.036	1.88
		(-1.97)	(1.55)	(-0.48)					
2	OLS	-1.914	0.545	-1.215	-	-	0.002	0.023	1.88
		(-1.36)	(1.50)	(-0.46)			(0.21)		
3	OLS	-1.750	0.571	-0.994	-0.594	0.460	-	0.093	2.06
		(-1.34)	(1.77)	(-0.43)	(-1.84)	(2.01)			
4	OLS	-2.589	0.191	1.357	-0.480	0.937	-0.019	0.114	2.10
		(-1.87)	(0.49)	(0.50)	(-1.47)	(2.56)	(-1.66)		
5	WLS	-2.937	0.144	3.287	-0.654	0.594	-0.022	-	-
		(-2.34)	(0.42)	(1.38)	(-1.99)	(2.04)	(-2.48)		
Medium-term unemployed (μ_2) (1967.1-1985.4)									
6	OLS	2.083	0.293	-8.588	-	-	-	0.497	2.04
		(2.70)	(1.26)	(-7.26)					
7	OLS	0.101	-0.042	-4.042	-	-	-0.015	0.561	2.23
		(0.11)	(-0.18)	(-2.32)			(-3.36)		
8	OLS	0.880	0.282	-6.166	-0.038	-0.410	-	0.534	2.19
		(1.01)	(1.218)	(-3.98)	(-0.15)	(-2.70)			
9	OLS	0.145	-0.051	-4.275	0.108	-0.059	-0.014	0.550	2.24
		(0.15)	(-0.18)	(-2.34)	(0.41)	(-0.24)	(-1.859)		
10	WLS	-0.191	-0.032	-3.673	0.123	-0.036	-0.017		
		(-0.21)	(-0.11)	(-2.02)	(0.54)	(-0.15)	(-2.28)		

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