

# Unemployment Insurance

by Edmond Malinvaud \*

## 1. Introduction

Unemployment insurance is a subject for public concern in all countries of the Western world. The existing systems vary a good deal from one country to another. More or less substantial revisions are often brought to these systems.

This shows that ideas still are fuzzy and uncertain about how best to pattern unemployment insurance. A need for clarification of the subject and for emergence of some reliable guiding principles is being felt. Economists and insurance specialists have to respond. In particular the Geneva Association, that addresses its efforts to the study of the economics of insurance, cannot neglect this particular, and somewhat special, case.

My own competence on the subject is slim. I cannot claim to do much more than expressing which problems have been perceived by those few who seriously worked on unemployment insurance. Accordingly, this paper will not present an original piece of research, but rather draw from the existing literature. Its purpose is to survey the many aspects that a full treatment of unemployment insurance should consider and to indicate how some of them have been tackled.

Unemployment insurance has features that make it akin to any other kind of insurance; but it is provided by what amounts to a public system, a feature that makes it also similar to other income support public redistributive schemes. It bears on the three traditional functions of public finance: stabilize the economy, improve the distribution of income and wealth, participate in the allocation of resources. Considering each one of these functions in turn will be the object of the main sections of the paper (sections 4 to 6). Some description of the unemployment risk and of the existing unemployment insurance systems is, however, required to start with (sections 2 and 3 respectively).

## 2. The unemployment risk

With respect to the labor market, an individual can be in any one of three different states: employed ( $e$ ), unemployed ( $u$ ) or, if he or she is not actively looking for work,

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inactive ( $r$ ). The transition from one state to another one depends on actions taken by the individual concerned and/or on chance. Which state prevails at a given time depends on past actions and past chance events.

According to a simple minded vision, the interplay of actions and chance could be described as follows : the individual would consider the choice as between being active or not ; the decision would then depend on his or her characteristics ; when the choice is for being active, chance would decide whether or not a job would be held. The loss  $L_i$  of individual  $i$  for being unemployed could be defined as the difference between the monetary equivalent of utilities derived respectively from being employed or unemployed :

$$(1) \quad L_i = U_{ie} - U_{iu}$$

In the absence of unemployment insurance, being inactive would bring at least as much utility as being unemployed ( $U_{iu} \leq U_{ir}$ ) so that individuals exposed to the risk of unemployment (i.e. those who would have chosen to be active) would suffer a positive loss in case of unemployment (they could not be in a case where  $U_{ie}$  would be smaller than  $U_{ir}$ ).

In order to cover the individual against this risk, a premium  $P_i$  would be levied in case of employment (occurring with probability  $p_i$ ) and a replacement income  $S_i$  would be granted in case of unemployment (with probability  $1 - p_i$ ). Full coverage for the unemployment risk would mean.

$$(2) \quad S_i = L_i - P_i = (U_{ie} - P_i) - U_{iu}$$

Abstracting from administrative costs, a fair coverage would be such that :

$$(3) \quad p_i P_i = (1 - p_i) S_i$$

Thus, a fair and full coverage would imply :

$$(4) \quad P_i = (1 - p_i) L_i \quad S_i = p_i L_i$$

Unfortunately, the above vision is too simple. On the one hand, individual characteristics, and in particular the probability  $p_i$  of employment and the loss  $L_i$  incurred in case of unemployment, cannot be precisely and objectively assessed. On the other hand, chance and actions are not separated in the simple way that was assumed. The complications arising from these two difficulties are not special to unemployment insurance ; but they play a particularly important role in this case <sup>1</sup>.

Clearly,  $p_i$  and  $L_i$  greatly vary from one individual to another one. They greatly vary in relation to observable characteristics of the individual, such as age, sex, race, level of education, labor income when working. But they also vary in relation to characteristics that are not easy or even impossible to observe (personal capabilities, work effort, family financial situation, taste and opportunity for non gainfull occupation, and the like). Unemployment insurance contracts could be fair in some average sense, but they cannot be fairly tailored to individual cases.

The first consequence is that voluntary unemployment insurance would particularly involve "adverse selection" : people deciding to best insure themselves would tend to be those for which  $(1 - p_i) S_i$  would be much in excess of  $p_i P_i$ . Insurance companies would

<sup>1</sup> About these complications concerning the economic theory of insurance in general, see for instance : the special issue of *The Geneva Papers on Risk and Insurance* edited by J. Stiglitz (Vol. 8, No 26, January 1983), "Risk, incentives and insurance : the pure theory of moral hazard".

then have to be aware of this selection and to increase premia or decrease replacement income accordingly. The insurance system would then not achieve high efficiency.

This adverse selection does not occur in existing systems, which are compulsory. But the diversity of individual characteristics play an important role in some of the questions raised by unemployment insurance. All the more so because the prevailing ethic forbids to use some of the individual characteristics, such as sex and race, as a basis for differentiating premia and replacement incomes. In other words, the existing systems have a double role: not only do they provide insurance against the risk of unemployment; they also realize social transfers from people that are little exposed to this risk to people that are much exposed.

Individual actions also, rather than chance only, have a role in explaining why some people are unemployed and others employed. Some workers may be dismissed because they are not working enough, some may remain unemployed because they are too lazy or too demanding in their search for a new job. This fact is important because the existence of insurance reduces, or even suppresses in the case of full coverage, the incentive for being employed.

This situation, in which the fact of being hit by the insured risk partially depends on one's own behavior, is well known in insurance more generally, where it is called "moral hazard". Its presence is responsible for some unavoidable inefficiency in the allocation of risks because some insured people make less efforts for avoiding the risk than if they were not insured. The usual way to cope in practice with this difficulty is to bound the degree of coverage below full coverage.

When moral hazard and unselectivity with respect to some of the pertinent individual characteristics both occur, as in the case of unemployment insurance, the argument for incomplete coverage as an average is reinforced. Indeed, individuals who would or do happen to be more than fully covered ( $S_i > L_i - P_i$ ) would or do voluntarily place themselves in the situation of being unemployed.

Two additional features related to unemployment insurance deserve attention. In the first place, the probabilities of unemployment  $p_i$  depend not only on workers behavior but also on employers behavior. For the management of their labor force, employers have some freedom; they may opt for a strategy of durable employment of their workers or for a strategy of frequent lay-offs and recruitings. To the extent that unemployment is socially costly, some inducement favoring the first strategy would be justified. Such an inducement does not seem to exist in any European country; but it exists in the USA where the amount of contributions paid by employers to unemployment insurance depends on their "experience rating", i.e. on the proportion of their workers that they laid off during a reference period.

In the second place, people decisions vary according to what is their economic environment, in particular according to what is the state of the labor market and according to what kind of unemployment insurance may cover them. This remark concerns both the initial choice as between being in or out of the labor force, and the subsequent behavior while being employed or unemployed. The existence of an unemployment insurance is likely not only to lead some covered workers to make fewer efforts to avoid unemployment, but also to lead more people to enter into the labor force and to remain in it.

### 3. Unemployment insurance systems

Any permanent system of unemployment insurance must be conceived so as to be able to face a great variety of individual cases, which has been already mentioned, and also a great variety of macroeconomic situations.

It is not a priori obvious that the compensation for unemployment should be patterned in the same way and grant the same real amount of allocation to any well defined unemployed worker, no matter what the general level of unemployment may be, the rates of contributions to the system varying so as to fit with the financing required (actually, fair and full coverage would imply that premium indeed increases, but also replacement income somewhat decreases, when the employment prospect deteriorates, as equations (4) show). Moreover, the existing systems have been the object of frequent changes that were motivated by a number of considerations, among which changes of the general employment situation played a role, which is, however, difficult to identify. In the present paper I shall nevertheless neglect the possibility that compensation rules may systematically change as a function of the general level of unemployment in the country. (Note that they nowhere seem to change as between professions or industries, depending of what are the respective unemployment rates in them.)

A common feature of the various systems seems to be that they are mainly financed by employers contributions computed from the wages paid to employees (employees contributions, where they exist, are withheld). This is then a kind of payroll tax. These contributions are often supplemented by transfers from the State budget, which are more or less explicitly considered as covering what amounts to assistance rather than to insurance. Although the details of these financing rules vary, one notes that they are nowhere close to apply the first one of equations (4), defining the premium to be paid for a fair and full insurance. No attempt is made in order to differentiate the contributions as a function of individual unemployment probabilities; the loss  $L_i$  to be covered by the insurance is implicitly identified to the wage income earned when the employee is working. This second feature also applies to the compensations paid to the unemployed workers.

Concerning unemployment benefits, the insurance systems vary a great deal from one country to another one and are still often revised. They have, however, some rather common features that must be recognized (exceptions will be neglected in this paper). The most significant one is to note that roughly the same pattern applies as to the degree of coverage of the unemployment risk: the period during which income compensation is obtained has a limited duration; some work experience is usually required for anyone being entitled to the benefit of the system; the replacement ratio, i.e. the ratio between replacement income and previous labor income, decreases as a function of previous income<sup>2</sup>.

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<sup>2</sup> I cannot claim to have a full knowledge of the situation. My main sources of information are: "L'indemnisation du chômage en France et à l'étranger", Document du CERC, Documentation française, Paris 1983; R. G. Ehrenberg and R. S. Smith, *Modern Labor Economics-Theory and Public Policy*, Scott, Foresman and Co., Glenview, Illinois, 1982; "The economic situation for Europe in 1981", section 1, iii), c) Economic Commission for Europe, UNO, New York, 1982; "Le problème actuel du chômage", section III. A, Note du *Secrétariat* de l'OCDE, document CPE/WP1 (83)6.

A worker who remains unemployed receives a replacement income during a limited period only after he or she has lost employment. The length of this period depends on his or her characteristics and work experience ; for the normal case of an adult with long previous work attachment, it is roughly of two years in Western Europe, of one year in the United States. The logic of this limitation is of course not to be found in the idea that the income need of an unemployed person would decrease with time, but rather in the notion that individual characteristics are not precisely observable. As a worker remains unemployed it becomes more and more likely that he or she is not eager to find another job and therefore loses relatively little with respect to what he or she can expect (a low  $L_i$ ) or, alternatively that he or she has, because of his or her individual characteristics, a low probability  $p_i$  of employment. In other words, the notion seems to be that, if the duration of unemployment support was unlimited, the system would have to subsidize too many people who either do not need to be supported or are unable to provide a valuable work and should therefore be supported by public assistance rather than by unemployment insurance.

Benefits are due only to those who, during a reference period (for instance the year preceding the loss of employment), have worked sufficiently <sup>3</sup> (for instance for six months). Other conditions must also be met, such as making suitable efforts to find another job and, in some systems, not to be personally responsible for the loss of employment (not to have been fired for cause or to have quitted). The logic of all these conditions seems to be quite similar to that explaining the limitation of the period during which replacement income is obtained.

According to the pattern that most often prevails, the replacement ratio is bounded above by a ceiling that is definitely smaller than one ; it is decreasing as a function of unemployment duration ; it is also decreasing as a function of previous labor income <sup>4</sup>. The two first features must again be explained by the difficulty of identifying individual characteristics, by the notion that the loss  $L_i$  is often smaller than the foregone wage income and by the need to protect the system against bad behavior of people who would benefit from its existence and would act in such a way as to be or remain unemployed (an extreme case of moral hazard). Actually, realization by public opinion that such possibilities existed is one of the reasons why ceilings of replacement ratios have tended to be revised downward during the recent years, almost always to less than two thirds, often much more. On the other hand, the fact that the replacement ratio decreases as a function of previous labor income has certainly much more to do with the idea that unemployment insurance must not only provide insurance but also contribute to the redistribution of incomes ; the same remark applies to the fact that in the United Kingdom the replacement ratio is more favorable for workers with dependents than for bachelors.

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<sup>3</sup> Some income support to unemployed new entrants in the labor force, particularly young people, also exists in many countries ; it is then often not granted by the unemployment insurance system.

<sup>4</sup> This description of the situation most commonly met is of course simplified. It neglects in particular the fact that unemployed people may be eligible to the benefit of social programs whereas they would not be eligible if they had a job. This feature seems to be particularly important for the United Kingdom, about which the reader may refer to various texts, sometimes contradicting each others. See for instance, P. Minford, *Unemployment : Cause and Cure*, Robertson and Co., 1983 ; A. W. Dilnot and C. N. Morris, "Private costs and benefits of unemployment : measuring replacement rates", *Oxford Economic Papers*, November 1983, Supplement.

#### 4. Economic stabilization

Thirty years ago unemployment insurance was often listed among the automatic stabilizers that prevent the aggregate demand multiplier from being too large. When an autonomous shift reduces aggregate demand, unemployment increases, which affects the purchasing power of workers; they are then led to decrease their consumption demand; thus, the initial depressing impact is subject to a multiplication effect. The force of this phenomenon was said to be dampened by the fact that insured unemployed workers receive a replacement income and then maintain their consumption to a higher level than they would otherwise do.

The argument so stated is somewhat misleading because it assumes that, when unemployment increases, the system can provide additional payments without raising additional contributions, as if it was drawing from some capitalized funds. Actual systems do not operate in this way, except in the short run. When unemployment steadily increases, contribution rates are periodically raised; transfers from the State budget, which may increase its deficit, remain the exception rather than the rule.

In order to speak of an automatic stabilizer of aggregate demand under these conditions, one must rely on a more subtle phenomenon, namely that the marginal propensity to spend is higher for the unemployment benefits than for the money that is absorbed in the payroll tax financing unemployment insurance. This is indeed likely since unemployed workers experience a decrease in their income and probably also in their borrowing facilities; the marginal propensity to spend the replacement income must be quite close to 1. On the other hand, increases of the payroll tax are to a large extent transmitted as increases of the price of output; this means that employer contributions are then paid by others on which the incidence of the pay-roll tax finally falls. It is clear and wellknown that this depends on the whole functioning of the economic system, so that this incidence varies. In general, however, the increase in contributions does not imply an equal decrease of aggregate demand, since most economic agents have a marginal propensity to spend that is definitely smaller than one.

More may be said, however, about the role of unemployment insurance for economic stabilization. In the first place, existence of this insurance reduces the income risk to which workers are exposed. This should lower whatever precautionary saving workers are making, particularly at times of bad employment prospect. Hence, a perverse effect of depressions on consumption demand should be dampened, which helps to economic stabilization.

In the second place, we must no longer stick to the traditional vision of economic fluctuations; their description and analysis must not be limited to the consideration of the aggregate demand for goods. Indeed, fluctuations of business profitability are also important and interact with those of aggregate demand. In this respect also, the existence of unemployment insurance may play a role.

In particular, when real wages are rigid and unemployment insurance is wholly financed by employer contributions, any increase of unemployment finally implies a change in the price system that deteriorates profit margins and adds to the already unfavorable effect of depression on business profitability. It thus appears that, in case of real wage rigidity, the existence of unemployment insurance, while helping to the

stabilization of aggregate demand, on the contrary makes stabilization of profitability more difficult. Which one of these two effects dominates at any given time depends of which one of the two factors, aggregate demand or profitability, plays the more crucial role at that time ; this cannot be determined once and for all <sup>5</sup>.

This dilemma would, of course, be avoided if unemployment contributions had no incidence on the profits earned by productive operations, for instance if they were coming from a direct levy on households incomes. But we know the now prevailing reluctance faced by any reform implying an increase of the direct taxation of these incomes, which is found already too heavy, whereas pay-roll taxes are more easily accepted.

The situation becomes worse and unemployment insurance has a definitely destabilizing effect if it is fully financed by a payroll tax within each year, if real wages are rigid and if the balance of payments imposes on the domestic aggregate demand for goods a constraint, which is a direct function of competitiveness. For a given evolution abroad, an increase of unemployment at home then pushes labor costs and prices up, deteriorates profitability and competitiveness, therefore imposes on government a restrictive demand policy, which further increases unemployment. Unfortunately, such a situation was often met in Western Europe during the past decade.

This discussion illustrates how intimately is unemployment insurance related to macroeconomic phenomena. The relation has been further studied from a viewpoint that looks beyond business fluctuations and that some theorists may consider as addressing resources allocation rather than stabilization. Since the discussion is definitely macroeconomic, considering it at this stage is, however, appropriate.

It has been argued that a better unemployment compensation results in higher real wages because unemployed workers are less pressed to take any job and employed workers less scared by the risk of losing their jobs. Since higher real wages induce a lower employment, particularly so when the balance of payments constraint is effective, improving unemployment compensation has the effect of increasing unemployment, and reducing compensation the effect of increasing employment.

About the potential existence of this macroeconomic effect there cannot be much disagreement. But its importance is debated. It depends on how sensitive are real wages to the degree of unemployment compensation and how sensitive is employment to the level of real wages. Very different estimates of these two elasticities have been given for the same economy <sup>6</sup>, and such elasticities may vary a great deal from one country to another, depending on the prevailing type of macroeconomic disequilibrium, depending also on how generous is unemployment insurance and how it is patterned, depending finally on institutional features of wage formation.

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<sup>5</sup> I have discussed at length this question in various writings, in particular in E. Malinvaud, *The Theory of Unemployment Reconsidered*, Basil Blackwell, Oxford 1977, and in E. Malinvaud, "Wages and unemployment", *Economic Journal*, March 1982.

<sup>6</sup> See the two following articles published side by side in *Oxford Economic Papers*, November 1983, Supplement : S.J. Nickell and M. Andrews, "Unions, real wages and unemployment in Britain 1951-79" ; P. Minford, "Labour market equilibrium in an open economy".

## 5. Redistribution

Undoubtedly unemployment insurance has favorable distributive effects, according to present ethical norms in our society, and this at two levels : among social groups and among individuals belonging to the same group. But it is very difficult to gauge the extent of these favorable effects.

This would already be somewhat difficult if the commonly accepted ethic could be described as aiming only at "income equalitarianism". Making this notion precise, finding the relevant data on the actual situation, defining the alternative fictitious situation without unemployment insurance would certainly raise a number of problems. The main features to be found in the results are, however, clear: unemployment insurance operate a significant redistribution (for instance in France in 1982 unemployment benefits amounted to 3.4 per cent of households disposable incomes); this redistribution benefits to those suffering an income loss and is proportionately less important for the previously best paid wage and salary earners, so that it reduces the dispersion of individual incomes; it also reduces income disparities as between social groups since unemployment is relatively more frequent for workers belonging to the lower part of the social scale (in France in 1982, the unemployment rate exceeded 8 per cent for unskilled manual workers and trade employees; it was smaller than 3 per cent for technicians and "cadres supérieurs").

But actually the commonly accepted norms deviate from income equalitarianism and are more subtle. Large income differences seem to be well accepted and even favored when they reflect differences in individual efforts; they seem to be also accepted when they come from differences in individual capabilities, as long as the impact of this source of disparity is not too strong. On the other hand, differences due to chance and to discrimination are considered as unfair; reducing them is commonly accepted as an objective.

Unemployment insurance undoubtedly compensates for the bad luck that at least some among the unemployed workers have experienced. It also somewhat counteracts the discrimination that exists on the labor market. It is well known in particular that unemployment selectively hits people belonging to groups that are not favored by those making the selection at the time of recruitments or lay-offs, usually because members of these groups are considered to be on average less productive than others when employed : young workers, women, colored people, foreigners, poorly educated workers and so on.

It is, however, difficult to evaluate the importance of these favorable redistributive effects of unemployment insurance, and this for two reasons :

- (i) the correlation between true losses and unemployment benefits is rather low ;
- (ii) we lack a good deal of the information that would be required for correctly assessing the losses.

The low correlation between losses and benefits follows from reasons that were discussed in section 3. At the individual level the loss resulting from unemployment is not tightly related to the previous labor income : it is equal to this income for those who attach no value to leisure, work at home or other activities ; it is much smaller for those who are close to being indifferent between working and remaining inactive ( $U_{ic}$  being only marginally higher than  $U_{ir}$  and  $U_{in}$ ). As the time spent by a worker in unemployment



increases, his or her utility loss must in many cases increase ; but we have seen that the benefit then declines and even disappears after some time, the reason for this pattern being that the unemployment insurance system cannot identify cases of low employability or of insufficient job search. In other words, unemployment benefits cannot be so tailored as to fit true losses resulting from bad luck or discrimination and occurring notwithstanding normal individual efforts spent to avoid them.

This explains why losses are difficult to evaluate at the individual level. One might, however, contemplate the less ambitious project of obtaining a statistical evaluation of them. But our present knowledge, leaves much to be desired with respect even to this more modest objective.

What is known, and makes the preceding comment particularly relevant, is that people unemployed at any time make a very mixed group and that unemployment experience will mean quite different things for them. Some will find a job quickly, even in some few cases a better job than the one they were previously holding ; others will quickly quit the labor force ; but others still will remain unemployed for a long time ; those who will find another job will on average remain more exposed to the risk of unemployment than those who have never been unemployed.

Some unemployed people live in households where one or more of their family members is gainfully employed, but others are not in this situation<sup>7</sup>. A full picture would certainly reveal also a great variety of cases as to the impact that unemployment has on the full life cycle of individuals and households experiencing it ; but the now available evidence is unsuitable for that purpose because it concerns rather short life spans<sup>8</sup>.

Notwithstanding these fundamental difficulties, one may still know something about international differences and evolutions through time of the extent of redistribution resulting from unemployment insurance<sup>9</sup>.

Around 1980, the proportion of the civilian labor force covered by unemployment insurance varied from 50 per cent in Japan to 90 per cent in North America, with numbers in between for Western European countries. For the first year of unemployment of a " typical worker " (a manual worker with two children whose wife does not work), the ratio between replacement income and previously earned income varied from less than 50 per cent (Italy and UK) to more than 90 per cent (Belgium and France). An aggregate indicator, defined as the ratio between the average amount of benefits received by unemployed persons and the average wage of a manual worker, varied from less than 20 per cent (Italy, UK and USA) to more than 50 per cent (France and West Germany).

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<sup>7</sup> See " Chômeurs : embauche difficile mais situations variées ", *Economie et Statistique*, avril-mai 1980.

<sup>8</sup> An exceptionally long span is covered by the US National Longitudinal Survey, which was used to examine the concentration of unemployment on men aged 45 to 59 during the four years 1965 to 1968. See K. B. Clark and L. H. Summers, " Labor market dynamics and unemployment : a reconsideration ", *Brookings Papers on Economic Activity*, 1979, N° 1.

<sup>9</sup> See footnote 2, page 9, for references to detailed information.

As for evolution during the past thirty years, one finds almost everywhere an increasing trend, recently followed by a decrease, of the extent of coverage of the unemployment risk. The time at which unemployment insurance was first judged to be too "generous" and therefore started decreasing was not quite the same in all countries: around 1975 in North America, 1978 in the United Kingdom, 1982 in France.

## 6. Allocation of resources

A number of questions are raised as soon as one takes the viewpoint of resources allocation. First, what is exactly meant here by this viewpoint? As is well known in public finance, the classical distinction between stabilization, redistribution and allocation may be applied in various ways for the analysis of a given problem.

To define the domain of the questions now to be discussed, I propose to loosely refer to the notions of long term, of equilibrium and of microeconomics. Alternatively, I could say they are questions for the treatment of which we can rely on modern neoclassical theory, including its extension to the study of second best optima. The hypothesis then is that, for dealing with the structural problems raised by the choice of an unemployment insurance system, one needs to take a long term view and to rely on precise microeconomic specifications, but that one is not led astray when assuming away the disequilibrium macroeconomic phenomena that deviate from the neoclassical vision. In other words, such phenomena have been considered here in section 4 dealing with stabilization; we now turn our attention to other questions. These may be grouped around the three following ones:

- (i) How does unemployment insurance affect resource allocation?
- (ii) Abstracting from its stabilization and redistribution effects, can one claim that unemployment insurance is welfare improving?
- (iii) How do actual unemployment insurance systems compare with an optimal system?

We shall consider these three main questions in turn, limiting our attention to what concerns the distribution of benefits, hence neglecting problems related to the mode of financing unemployment insurance. A brief mention of the latter problems was made in section 4; what could be said here would not be specific, since it would start from the notion that unemployment contributions are similar to other payroll taxes<sup>10</sup>.

(1) The fact that the existence and extent of unemployment insurance change behavior on the labor market appears now to be undisputable. The relevant problem rather is to precisely describe these changes. The econometric work of the past ten years has been rewarding in this respect. Rather than surveying it, I shall mainly draw here on a particular recent study that roughly confirms earlier ones and is more comprehensive<sup>11</sup>.

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<sup>10</sup> This notion does not perfectly apply to the USA, where the rate for the contributions to be paid by an employer depends on its past record with respect to the number of layoffs he decided. The "experience rating" of the employer, which thus determines his rate of contribution, is the ratio between the number of layoffs during a reference period and the number of employees. The American literature pays some attention to consequences following from this special feature.

<sup>11</sup> K. B. Clark and L. H. Summers, "Unemployment insurance and labor market transitions", in M. N. Baily, ed., *Workers, Jobs and Inflation*, The Brookings Institution, Washington 1982.

Unemployment insurance makes the situation of being unemployed less unfavorable. As a consequence, it increases the frequency of movements into unemployment, and this from employment as well as from outside of the labor force. Similarly, it increases the length of unemployment spells, because unemployed people do not quit the labor force as long as they receive benefits, and because those looking seriously for a job are less financially pressed and therefore somewhat more choosy.

Estimates of these various effects are not precise ; but it seems now clear that the effects are not very strong<sup>12</sup>. Their aggregate impact was estimated by K. B. Clark and L. H. Summers for the U.S.A. in 1978 by comparing the actual situation with an alternative hypothetical one. Two calculations were made. Under the extreme hypothesis of a complete elimination of unemployment insurance, it was found that the unemployment rate would have decreased from its actual 6.00 per cent to 5.35 per cent, and that the rate of participation of working age people to the labor force would have decreased by 1.1 per cent. A more acceptable 10 per cent reduction in unemployment insurance benefits would have resulted in an unemployment rate of 5.92 per cent and in a decrease of 0.1 per cent for the participation rate.

One should moreover keep in mind that part of this phenomenon so measured does not concern the real allocation of resources but rather the way in which one given person reports his or her status when asked to do so. Some people who are not employed tend to report themselves as unemployed as long as they are eligible to unemployment insurance benefits but to report themselves as being out of the labor force otherwise. A change in eligibility conditions therefore changes reported unemployment more than it would change unemployment if it would be measured by a more objective yardstick.

The previous effects are predicted by search theory, which was recently developed in mathematical economics and considers the behavior of rational agents searching for good opportunities on the market. Search theory predicts also that the wage rate paid to a newly recruited worker is an increasing function of the unemployment benefit he would have obtained if he had not accepted the job. The actual significance of this effect was, however, not clearly established in econometric studies<sup>13</sup>.

(2) Is unemployment insurance welfare improving? Confronted with this question I want for the time being to look rather heuristically at its various aspects. Reference then needs not be made to any precise system but mainly to the general features of existing systems, which are public, cover practically all employed workers and are financed mainly or exclusively by payroll taxes. We have already seen that unemployment insurance has favorable redistributive effects and we now no longer consider this point.

More precisely two aspects of unemployment insurance can be considered at this stage :

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<sup>12</sup> In the spirit of what was announced at the beginning of this section we take here as given all characteristics of the demand side of the labor market, in particular the number of jobs offered and the wages attached to them.

<sup>13</sup> See R. G. Ehrenberg and R. L. Oaxaca, " Unemployment insurance, duration of unemployment and subsequent wage gain ", *American Economic Review*, Vol. 66, pp. 754-66, 1976.

- (i) at the level of the individual employed worker, it covers against the risk of unemployment and therefore increases *ex ante* welfare by comparison with what it would otherwise be ;
- (ii) at the level of the whole economy, it may permit a better working of the labor market and therefore a better use of the available human resources.

At the individual level, unemployment insurance is welfare improving in the same way as other kinds of insurance. A worker, who is averse to risk, reaches higher mathematical expectation of his or her utility if he or she is covered by a fair unemployment insurance, the wage being decreased by the amount of the payroll tax, than if he or she was fully exposed to the risk. This effect is increased by the fact that, in case of unemployment, the worker could not always dissave to the full extent of what a life cycle consumption plan would imply, because he or she could not borrow, or at least not borrow enough.

The case for a public rather than a private unemployment insurance is similar to that applying to other social security programs. On the one hand, a public system can operate a redistribution that a private system, subject moreover to the self selection bias, could not do. On the other hand, unemployment insurance is often considered as meeting a “ merit want ”, i.e. a want of which the individual is not enough aware ; compulsory insurance increases his or her welfare, as evaluated in a social utility function, even if he or she would not voluntarily take it.

The existence of unemployment insurance also reacts on the working of the labor market, and this in a way that I consider, on the whole, as improving the allocation of human resources. The point is of course debatable. I cannot report here a consensus among those who considered it.

Indeed, critics of unemployment insurance started from precisely the opposite assertion<sup>14</sup>. They pointed to three kinds of labor market distortions. First, there would be in many cases overcompensation of losses ; in particular, secondary family workers, who have strong options in home production, would often be too liberally covered and benefit undue transfers from the system.

Second, the existence of unemployment compensation would induce many unemployed people to be lazy in their search for new jobs ; the moral hazard effect would be strong in their case.

Third, firms with stable employment would subsidize the benefits paid to the employees of firms with higher layoff rates ; this would apply even in the U.S.A. because of lapses from the “ experience rating ” applied there ; as a consequence turnover rates would be excessive. The two last factors would inflate unemployment and be responsible for a permanent loss of output.

These distortions deserve attention. The existence of the two first ones is commonly recognized and may explain why the recent reduction of replacement ratios in many countries was easily accepted: the moral hazard effect deteriorates efficiency in the

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<sup>14</sup> See for instance A. Katz and J. E. Hight, “ The Economics of unemployment insurance : a symposium — Overview ”, *Industrial and Labor Relations Review*, July 1977.

allocation of resources and also diverts the distribution of benefits, making it less effective even from an equity viewpoint. Whether unemployment insurance leads to an excessive turnover seems to be much more doubtful, particularly so in Western Europe.

Indeed, an optimal utilization of human resources requires a good match between jobs and workers. If unemployed workers are too pressed to take any offer, by lack of financial availabilities or even by the wish to avoid the disrepute of remaining unemployed, the match may be more imperfect than it would otherwise be. If employed workers, who feel they could be more productive in a different job, are reluctant to quit because of both the loss of their seniority advantages and the risk of remaining unemployed for too long, if firms are on their part reluctant to layoff or dismiss workers because of their concern to what would happen to their former employees, or of their fear of social unrest within the firm, again the match may be inadequate. A certain amount of unemployment and a certain degree of turnover are healthy for the allocation of resources. Unemployment insurance may well be favorable on this account because it somewhat counteracts behavior preventing an optimal allocation of workers among jobs.

It was also argued that risk aversion, together with the fact that wages are fixed by collective agreements, which do not discriminate enough, lowers the incentives for workers to specialize in narrow but useful qualifications, the risk for these qualifications to become obsolete later in their life being real. The existence of an unemployment insurance system provides a welcome safeguard that promotes useful specialization<sup>15</sup>.

Conflicting considerations then come into play when we ask whether the impact of unemployment insurance on the working of the labor market improves or deteriorates the allocation of human resources. If I conclude in favor of improvement, it is because I interpret the econometric evidence as showing that the moral hazard effect is moderate and because I am sensitive to the other arguments given above, which seem to apply particularly well in the French context. But I recognize that the available results do not strongly prove the point.

(3) Many questions concern the way in which unemployment insurance is exactly patterned and how it might be reformed. Discussion of these questions seems to require a more precise modelization and a deeper theoretical analysis. For studying the allocation of resources, the natural approach is to study first what an optimal system would be under ideal conditions and then to introduce explicitly the actual constraints that prevent realization of these conditions; one may then speak of the search for a "second best optimum".

Clearly, I shall not cover here the full range of questions that might be raised. I shall not even survey the existing literature, which is recent and still spotty with respect to the many dimensions of the subject. I shall attempt only to give a flavor of what has to be done for a good theoretical grasp of the issues to be discussed.

The first step is to select an appropriate modelization of the labor market, a modelization in which movements into and out of unemployment have to be correctly

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<sup>15</sup> See F. P. Stafford, "More on unemployment insurance as insurance", *Industrial and Labor Relations Review*, July 1977.

represented in relation with their main determinants. The literature already contains various models intended for this purpose. I shall describe just one of them here <sup>16</sup>.

Let us neglect movements into and out of the labor force and assume that all workers are alike. Unemployed workers search for jobs. They find job offers according to a Poisson process with parameter  $\alpha$ , which means that on average one of them finds  $\alpha$  offer per time period. The offer is characterized by a wage rate  $y$  and by a productivity requirement  $z$ . Productivity  $p$  of the workers in the various jobs is assumed to vary according to a distribution  $F(p)$ ; at the time of recruitment it is checked by a test and recruitment occurs only if  $p \geq z$ . Employed workers are exposed to a constant risk of being laid off, the probability of this risk being  $\delta$  per time period.

It is then easy to find that there exists a stationary regime in which the rate of unemployment is a function of  $\alpha$ ,  $\delta$  and the probability of success at the productivity test  $1 - F(z)$ . More precisely this rate of unemployment is :

$$(5) \quad \varphi(z) = \frac{\delta}{\delta + \alpha [1 - F(z)]}$$

All workers are assumed to be covered by unemployment insurance and to receive a benefit  $b$  by time period when unemployed. When in this situation, they bear the cost  $c$  of job search but they have more time for other activities than gainful work, the monetary equivalent of satisfaction drawn from these activities being  $x$ . On average they then reach a utility level  $U$ , which may be written as :

$$(6) \quad U(y, z; b) = \varphi(z) u(x + b - c) + [1 - \varphi(z)] u(y)$$

where  $u(y)$ , the elementary utility function, is increasing and concave ( $u' > 0$ ;  $u'' < 0$ ).

All firms are assumed to be identical and each one of them to offer the full range of jobs. Moreover, they produce directly from labor, and this independently in the various jobs. In a job of productivity  $p$  the output is precisely  $p$  per worker. On average output per employed worker then is :

$$(7) \quad w(z) = \frac{\int_z^{\infty} p dF(p)}{1 - F(z)}$$

For each employed worker they must pay the wage rate  $y$  and a payroll tax  $t$  that finances unemployment insurance. Competition among the firms implies a zero profit, hence :

$$(8) \quad w(z) - y - t = 0$$

The unemployment insurance has no administrative cost and is fair in the sense of equation (3) of section 2, which with the notation used here implies :

$$(9) \quad t = \frac{b \varphi(z)}{1 - \varphi(z)}$$

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<sup>16</sup> It is presented in D. T. Mortensen, "A welfare analysis of unemployment insurance : variations on second best themes", Carnegie-Rochester Conference Series, 1984. The subsequent pages freely draw here from the first part of the paper.

For any given benefit amount  $b$ , and corresponding payroll tax rate  $t$ , competition between firms and workers determines the terms of the contracts  $(y, z)$  which finally are used. Without going into a detailed representation of this competitive process, we may represent its equilibrium result as being such that it maximizes workers average utility level while implying a zero profit for the firms. In other words, it maximizes  $U$ , as defined by (6), under the constraint :

$$(10) \quad H(y, z; b) = w(z) - y - \frac{b\varphi(z)}{1 - \varphi(z)} = 0$$

Alternatively, we may consider maximization of (6) under the constraint (10) as defining what the optimal allocation of resources ought to be, once a level  $b$  has been predetermined. Like in many other questions of economic theory, whether one takes this normative viewpoint or the positive viewpoint of competitive equilibrium does not much matter.

Finally, the optimal fair unemployment insurance will of course be defined by the benefit  $b$  that, together with  $y$  and  $z$ , maximizes the utility (6) under the constraint (10).

Before going any further, we may pose for a minute and realize the many hypotheses we had to make in order to define a manageable mathematical model in which the labor market would be represented, together with the economic environment with which it interacts. This is typical of the modern literature on theoretical issues of labor economics. Indeed, it is unavoidable if one wants to bring into consideration for instance the various points raised earlier in this section. Many other models can be imagined and they will differ to a more or less large extent from the present one ; but all of them will need to be explicit about their hypotheses which, when spelled out as above, will look impressive and restrictive. Notice, however, that loose verbal thinking is not to be preferred, precisely because it hides the many aspects that have to be specified within any attempt at making arguments rigorous.

Given the model specified here, we may first consider the case in which  $\alpha$ ,  $\delta$  and the function  $F(p)$  would be fixed and independent in particular of the level of benefit. Taking this case is tantamount to *assuming away moral hazard*, which is not negligible in the present context. What is involved at this stage is not to really solve the problem, but rather to determine a benchmark from which a more realistic solution will be derived at a later stage.

This benchmark is interesting for two reasons. In the first place, the optimal fair unemployment insurance implies complete coverage :

$$(11) \quad x + b - c = y$$

which, together with (9), is here the equivalent of equations (4) of section 2.

In the second place, if one was concerned by the fact that  $x$  is not observable and therefore equation (11) not operational for the determination of  $b$ , one might derive an easy rule when knowing a second property : an increase of  $b$  is welfare improving precisely when it increases unemployment.

Proving these two properties is now purely a mathematical exercise. One needs to consider the Lagrangean :

$$(12) \quad L(y, z; b) = U(y, z; b) + \lambda H(y, z; b)$$

Taking its derivative with respect to  $b$  and considering the equality to zero of its derivative with respect to  $y$ , an equality that holds at any equilibrium, one finds :

$$(13) \quad \frac{\delta L}{\delta b} = \varphi(z) u'(x + b - c) - \frac{\lambda \varphi(z)}{1 - \varphi(z)}$$

$$(14) \quad \frac{\delta L}{\delta y} = [1 - \varphi(z)] u'(y) - \lambda = 0$$

Hence :

$$(15) \quad \frac{\delta L}{\delta b} = \varphi(z) [u'(x + b - c) - u'(y)]$$

The Lagrangean is increasing with  $b$  precisely when the marginal utility is greater at  $x + b - c$  than at  $y$ ; since the utility function is concave, this occurs precisely when  $x + b - c$  is smaller than  $y$ . The optimal value of  $b$  must imply equality (11) (first property).

In order to prove the second property one must take into account the equality to zero of the derivative of the Lagrangean with respect to  $z$ . After tedious calculation, this condition leads to :

$$(16) \quad u'(y)(z - y) = \varphi(z)[u(x + b - c) - u(y)]$$

This equation, together with (10), determines  $y$  and  $z$  as functions of  $b$ .

Differentiation of these two equations shows, again after tedious calculation, that  $z$  is an increasing function of  $b$  precisely when  $x + b - c$  is smaller than  $y$ . This proves the second property since the rate of unemployment is obviously an increasing function of  $z$ , as shown by equation (5).

*The presence of moral hazard* complicates the analysis. Neither of the two preceding properties can be expected to hold when it is taken into account. Indeed, it is known in general that complete insurance then is not optimal because people exposed to the risk would then have no incentive for reducing its probability of occurrence<sup>17</sup>. In practice, partial insurance is well established as the rule in other insurance areas. It is realized in various ways. For instance one may speak of "coinsurance" if  $x + b - c$  is smaller than  $y$  (the worker assumes part of the insurance); one may speak of "deductible" if, as it often occurs, unemployment benefits are not paid for the beginning of the period during which the worker is unemployed (the first week for instance).

To study the best extent and pattern of unemployment insurance under moral hazard requires a complication of the above analysis. In the particular model under consideration, one should recognize that the probability  $\alpha$  with which an employed worker meets a job offer depends on his or her effort, as measured by the cost of search  $c$ . This cost then is no longer a parameter but a decision variable. The probability  $\alpha$  is an increasing function  $\alpha(c)$  of  $c$  and the unemployment rate  $\varphi$  depends no longer only on  $z$  but also on  $c$ .

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<sup>17</sup> See for instance the special issue of *The Geneva Papers on Risk and Insurance* edited by J. STIGLITZ (vol. 28, n° 26, January 1983), "Risk, incentive and insurance: the pure theory of moral hazard".



I shall not discuss here the mathematical treatment of the model so extended. This treatment would follow the same lines of argument as the one concerning more generally moral hazard in insurance contracts (see the reference given in footnote 17). I shall simply present two of the results obtained from a somewhat different but similar model by M. N. BAILY<sup>18</sup>.

One first result shows that a “deductible” of the type described above is not appropriate for unemployment insurance. In fact, there is a case instead for a positive “redundancy payment” that would be paid at the time when a worker becomes unemployed (introduction of this payment would be combined with some lowering of weekly benefits).

The second result concerns the optimal level of the unemployment benefit  $b$  granted by a fair insurance of the type represented in the model of this section. From his model, which, with reference to ours, assumes in particular  $x = 0$  (no utility of forced leisure) but takes saving into account, Martin BAILY obtains a formula that may be described as approximately saying the following: the proportional drop in consumption resulting from unemployment should be equal to the ratio between the elasticity of the rate of unemployment with respect to the amount  $b$  of benefits and a measure of the degree of risk aversion of workers (according to usage in the literature of mathematical economics, this measure is the “relative risk aversion” evaluated when consumption is constrained by unemployment).

Considering that a replacement ratio ( $b/y$ ) of 50 per cent induces in the U.S.A. that the consumption of unemployed workers has to drop by 15 per cent, Martin BAILY then points out that this ratio would be about optimal if the degree of risk aversion was equal to 1 (a figure often quoted as appropriate) and if the elasticity of the rate of unemployment with respect to replacement income was equal to 15 per cent (a figure that is not out of line with the one resulting from estimates derived by Clark and Summers and reported above).

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At the end of this survey on the economics of unemployment insurance, it appears that precise answers to quite many questions are still lacking. We have little factual knowledge about some important aspects of the risk being covered. Our theories, for what appears to be a quite complex set of issues, are still incomplete and often inconclusive. Our ethics as to the choice of recommendations to policy makers confronted with various trade-offs is uncertain. This is why the subject should attract still more scientific attention.

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<sup>18</sup> M. N. BAILY, “Some aspects to optimal unemployment insurance”, *Journal of Public Economics*, vol. 10 (1978), pp. 379-402.