

ECONOMIC PAPERS

Number 133

February 1999

Net Replacement Rates of the Unemployed. Comparisons of Various Approaches

Aino Salomäki and Teresa Munzi*

*Aino Salomäki is an economist in the Directorate-General for Economic and Financial Affairs (DG II) of the European Commission. Teresa Munzi worked as economist in DG II in 1995-1997. The authors wish to thank Marco Buti, Jan Host Schmidt and Paolo Sestito from DG II as well as Bengt Eklind from the Swedish Ministry of Finance and Marcel Einerhand from the Dutch Ministry of Social Affairs and Employment for useful comments. The research and editorial assistance of Karin Granevi is also gratefully acknowledged.

Net Replacement Rates of the Unemployed. Comparisons of Various Approaches

CONTENTS

EXECUTIVE SUMMARY	4
INTRODUCTION	10
I STUDIES BASED ON STYLISED CALCULATIONS	15
I.1 OECD, Seven Countries Group and Central Planning Bureau: Net replacement rates for stylised household types	15
I.1.1 OECD.....	16
I.1.2 Seven Countries Group	20
I.1.3 Central Planning Bureau	23
I.2. Comparison between net replacement rates for stylised households	25
II STUDIES BASED ON EMPIRICAL DATA	28
II.1 Comparability of approaches	28
II.2 A Study based on the European Community Household Panel (ECHP)	29
II.2.1 The methodology	29
II.2.1.1. Data	29
II.2.1.2. Definitions of target populations and observation units	30
II.2.1.3. In- and out-of-work income.....	31
II.2.1.4. Comparison of disposable income between the unemployed and employed	33
II.2.2 Main results of the analysis	33
II.2.2.1. Structural characteristics	34
II.2.2.2. Net replacement rates	38
II.2.2.3. Distribution of out-of-work income relative to average in-work income.....	43
II.2.2.4. Summary of the results	45
II.3 Another approach to ECHP data	46
II.4 Swedish case study	49
II.5 Comparison between empirical and stylised net replacement rates	51
III CONCLUSIONS AND FURTHER RESEARCH	54
References	58
ANNEX A MESSAGE FROM THE LITERATURE	62

LIST OF TABLES

Table 1a	OECD, 1994: Net replacement rates for single-earner households	17
Table 1b	OECD, 1995: Net replacement rates for single-earner households	18
Table 2	Seven Countries Group, 1994: Net replacement rates for one-earner households.....	21
Table 3	Central Planning Bureau, 1993: Net replacement rates for single-earner households	24
Table 4	Summary measure of net replacement rates in the first month of unemployment.....	26
Table 5	Numbers of the unemployed and the unemployment rates according to ECHP and Labour Force surveys in 1993.	34
Table 6	Share of individuals, number and share of the unemployed and the incidence of unemployment in 1993.	35
Table 7	Numbers and take-up rates of all benefits and unemployment benefits.....	36
Table 8	Net replacement rates (RR) of unemployed individuals.	38
Table 9	Net replacement rates according to level of education	39
Table 10a	Net replacement rates (RR) of unemployed individuals according to sex and age.....	41
Table 10b	Net replacement rates (RR) of unemployed individuals according to sex and age.....	42
Table 11	Distribution of out-of-work income of unemployed individuals relative to the average in-work income	44
Table 12	Net replacement rates and take-up rates of unemployment benefits in DG V and DG II studies.....	48
Table 13	Swedish net replacement rates for some household types by various approaches	50
Table 14	Comparison of empirical and stylised net replacement rates.....	52

NET REPLACEMENT RATES OF THE UNEMPLOYED. COMPARISONS OF VARIOUS APPROACHES

EXECUTIVE SUMMARY

Several factors influence the performance of the labour market. Amongst these factors, the parameters of the general transfer systems and tax rates have important effects on both labour demand and labour supply. The supply side of the labour market is affected by tax and transfer systems through their impact on economic incentives for work. More precisely, there are two elements affecting labour supply: the benefit level relative to earnings and the marginal increase in disposable income when earnings rise. The first relates to the so-called unemployment trap and the second to the poverty trap.

This note aims to examine the problem of the unemployment trap. The analysis of economic incentives is primarily made with the help of the concept of net replacement rates, which is defined as a ratio of disposable income based on social benefits when out of work and disposable income gained from work.

Stylised studies

Until now, there have been relatively few comparative studies on net replacement rates. Most of them are based on simulation calculations for a set of stylised households, assuming an in-work situation as a starting point, and in the second phase, an unemployment situation where the unemployment benefit is computed on the basis of a given wage level according to the entitlement rules. This is known as the *ex ante* approach. Additionally, the calculations take account of the interaction of taxes and supplementary benefits like family and housing benefits and social assistance.

The first comparisons of net replacement rates have been accomplished by a group of national experts, known as the Seven Countries Group, and the Central Planning Bureau in the Netherlands. Subsequently, the OECD has started to calculate regularly net replacement rates covering a larger set of countries. The first studies relate to the years 1993-95. These studies apply the same kind of *ex ante* analysis based on simulation calculations for a set of stylised households. As a benchmark for cross-country comparisons, the wage level of the “average production worker” (APW), as defined by the OECD, has been chosen. The net replacement rates have been calculated for a selection of family types with an income range below and above the APW.

By and large, the aforementioned calculations of net replacement rates of unemployment benefits lead to broadly similar conclusions. While there are differences between the levels of replacement rates in various calculations due to differences in detailed assumptions, the country rankings are very similar. The

calculations allow the distinction to be made between groups of countries with – arbitrarily defined - high, intermediate and low replacement rates. High replacement rates are found in Luxembourg, Netherlands, Denmark, Finland, Sweden, France and Portugal. Intermediate replacement rates are found in Austria, Belgium, Germany, Spain and the United Kingdom and the lowest rates in Greece, Ireland and Italy. The net replacement rates for low-wage earners are above 70 per cent in almost all countries; they are below that only in Austria, Ireland and Italy for single persons and couples without children and only in Italy for families with children.

Empirical studies

The stylised calculation method has given rise to discussion for a number of reasons such as i) different results in various studies, ii) non-representative stylised households and iii) sensitivity to various assumptions.

Empirical studies are important to verify the results of the stylised approach, in order to verify whether the actual net replacement rates are as high as the simulated ones and to check how many individuals or households are affected by such replacement rates. Moreover, whilst capturing the variation in household situations and the actual relevance of these situations, these studies can also provide additional information on average measures and distribution of replacement rates.

In computing net replacement rates, in principle, two different labour market situations of the same individual are compared with each other. However, in practice, the available empirical cross-sectional data do not allow the same individuals to be followed longitudinally. Therefore, different groups of unemployed and employed are compared, based on the assumption that these groups have otherwise similar characteristics, and thereby resulting in a non-conventional interpretation of the concept of net replacement rate.

The Commission services of DG II have conducted the present study of the net replacement rates of the unemployed (hereafter, DG II study) on the basis of the first wave of the European Community Household Panel (ECHP) survey in 1993. In this study the populations of unemployed and employed in working-age groups were compared and the disposable income of the unemployed was compared with that of the employed, thus aiming to give an empirical equivalent to the net replacement rate. The concept of disposable income was calculated individually by allocating family-related benefits to individuals of working age.

Previously, the services of DG V had conducted another study of net replacement rates based on the same data but defining the target population and individual net income differently. In that study only the net monthly income during two different labour market positions of those who had been unemployed and employed during the reference year was compared, thus applying a concept of net benefit and net earnings (excluding family-related benefits).

The main results of the present (DG II) study based on the ECHP Survey in 1993 suggest the following conclusions:

(1) The average net replacement rate for all unemployed was 52 per cent and 64 per cent for those in low-income households. The highest net replacement rate for all unemployed was found in Denmark, 74 per cent, whereas it was around 50 per cent in most countries. Apart from Denmark, high replacement rates in the sub-population of low-income households were found also in Ireland, Germany and the United Kingdom.

(2) The take-up rate of benefits of all sorts (unemployment, housing, family allowances, social assistance etc.) amongst all unemployed was at 67 per cent, twice as high as the take-up rate of unemployment benefits alone, 33 per cent. In Belgium, Denmark, Germany and Ireland over 90 per cent of all unemployed received some benefits. The take-up rates of unemployment benefits were notably low in many countries, especially in the southern European countries.

(3) According to the ECHP survey, 32 per cent of individuals belonged to low-income households, *i.e.*, the disposable income was less than two thirds of the average disposable income, ranging from 22 per cent in Denmark to 40 per cent in Portugal. The share of the unemployed in low-income households was 59 per cent, almost twofold the share of all individuals, ranging from 37 per cent in Denmark to 76 per cent in the United Kingdom.

(4) Around 60 per cent of all unemployed who received benefits had an out-of-work income which was less than half of the average in-work income. However, more than 20 per cent of the unemployed, about 2.5-3 million people in 12 Member States, received an out-of-work income which was over 70 per cent of the average in-work income. In low-income households, one third of the unemployed had an out-of-work income more than 70 per cent of the average in-work income in low-income households and 16 per cent of the unemployed had an income more than the average in-work income.

These figures will have to be handled with care. For instance, there are apparent discrepancies in the quality of data in the ECHP survey. The ECHP has failed to measure unemployment in a consistent manner with the Labour Force Survey. In the ECHP survey unemployment is defined at the moment of the interview according to the interviewed person's own definition, whereas the Labour Force Survey requires active job searching. In some countries, the differences are moderate and can reflect differences which are also found between the national administrative sources and the Labour Force Survey. In some other countries, however, (Greece, Italy, Luxembourg, Netherlands and Portugal), the unemployment figures are far too high, and thus risk erroneous conclusions on living conditions of the unemployed or on the calculation of take-up rates. In fact, the lowest take-up rates of benefits were found in the countries where the greatest discrepancies in unemployment figures between the ECHP and Labour Force Surveys also existed.

Comparison of stylised and empirical results

The direct comparison of the results of empirical studies with those of stylised net replacement calculations is inappropriate in many respects. First and foremost, two completely different methodologies are compared. Even though they aim to capture the same phenomena, strictly speaking the results describe different features of tax and benefit systems. Ex ante net replacement rates for stylised households aim to describe how the tax-benefit systems have been designed to work and how the interaction of taxes and benefits affects the final outcome. Empirical net replacement rates for actual households tell us how extensively people in reality exploit all the possibilities which the tax-benefit systems offer. But additionally, they reflect the influence of many other factors which, by definition, are excluded from stylised calculations which reveal the “pure” impact of systems.

It is not easy to find proper summary measures for comparing results of different approaches. In particular, the large variation in family and duration composition of unemployment, which is caught in empirical studies, is difficult to display with stylised measures. Even unemployment is not easy to define in the same way. Stylised calculations consider the unemployed as a person who is eligible to draw unemployment benefits, whereas the empirical data tend to show the unemployed in a broader sense also possibly including non-employed persons. The differences may also arise from the availability of benefits, which can be affected by reasons other than the pure eligibility rules, *e.g.*, the administration of benefits. Additionally, the empirical studies referred to in this report differ from the stylised calculations in focusing the impact of unemployment. The unit of analysis of stylised calculations is the household, whereas the empirical studies were conducted more on an individual level. Moreover, the DG V study applied a narrower concept of disposable income than the DG II study or the stylised calculations.

The differences in the approaches of the two empirical studies (DG II and DG V) reflect, on the one hand, the complexity of the subject and the multiplicity of definitions which the data allow, and on the other hand, the as yet unestablished practice in research. While the present study, compiled by DG II, tries to examine the whole extent of unemployment and the economic living standard of the unemployed in relation to that of the employed, the DG V study tries to have better control of economic changes in circumstances where individuals move in and out of employment.

Whilst keeping in mind the previous elements of caution, the results of stylised and empirical net replacement rates can be compared tentatively. There are two benchmarks for stylised calculations: the net replacement rate of the first month of unemployment and that of the 60th month. While the DG II approach covers all unemployed, neither the first month’s nor 60th month’s rate perfectly correspond to the “average” duration of unemployment in real data. The approach of DG V is closer to the first month of unemployment because the study was confined to those having been both unemployed and employed during the reference year. Yet, the following conclusions can be made:

(1) For about half of the countries, there was a fair match between empirical and stylised results. However, the empirical replacement rates were in some countries significantly lower than the stylised rates. Notably this was the case in the Netherlands and Luxembourg where these two approaches gave quite different results: the stylised calculations result in high net replacement rates in both countries, whereas the empirical study puts these countries amongst those with the lowest rates. Also in Belgium, Germany and the United Kingdom empirical replacement rates were somewhat lower than the stylised ones.

(2) There seems to be less variation in empirical average net replacement rates between countries than between the stylised ones. If some exceptional values are excluded, the empirical average replacement rates varied within the range of 44-56 per cent, whereas the stylised rates varied within the range of 61-87 per cent for the first month's compensation and 46-82 per cent for the sixtieth month's compensation.

A great number of variables affecting the comparison between stylised and empirical calculations could not be properly controlled. First of all, as was pointed out above, the definition of unemployment is not easy, and different surveys seem to give it different content. Moreover, other studies suggest that a great deal of income differences between the groups of unemployed and employed are due to differences in household and individual characteristics affecting the composition of the groups compared. In addition to this aspect, other studies draw attention to the economic impact at household level and its consequences for individual work incentives. It is evident that taxes and family-related benefits are an integral part of the social protection system, which influence the disposable income of the family of the unemployed and thereby also the work incentives of unemployed family members. Family-related benefits were only included in the DG II study.

Concluding remarks

Unemployed people are sometimes eligible to benefits other than unemployment benefits, such as training allowances, specific allowances to laid-off people or social assistance while, on the other hand, some non-employment benefits such as early retirement or disability benefits may increase the number of people affected by work incentive problems. The present study is confined to studying individuals who were defined as unemployed. However, taking into account the large differences in the numbers of unemployed between the ECHP and Labour Force Surveys, it seems evident that the ECHP figures include a large number of non-employed people as well. Basically, their benefits, possibly related to non-employment, were also included in the DG II study. This broader concept of unemployment could be an advantage in order to have a larger view of work incentive problems. But, the study was not based on a clear definition of the inclusion of all non-employed in the target group, and most likely did not include all non-employed. However, for the purpose of comparison of results with the stylised calculation this is an obvious disadvantage. Therefore, a clearer distinction between the unemployed and non-employed would be desirable.

International comparisons of the incidence and distribution of high net replacement rates have suffered from the lack of appropriate data. The European Community Household Panel will improve the situation considerably, in particular, when longitudinal data will be available. It allows further progress to be made in comparing economic living standards of the unemployed and the non-employed relative to that of the employed as well as in examining labour market patterns and transitions and estimating the labour supply parameters.

Whilst appropriate data will allow more reliable international comparisons, the latter do not allow conclusions to be drawn on work disincentives and the extent of unemployment traps. National experiences of the use of microsimulation models in examining the incidence and distribution of high replacement rates will allow one to bridge that gap. Only the simulation approach allows the possibility to examine replacement levels and thereby work incentives at the individual level, *i.e.*, the likely benefit level of those in employment or the likely wage level of the unemployed. This kind of model would offer a powerful tool for analysing work incentives and labour market transitions.

INTRODUCTION

The changing relationship between welfare state and labour market

In the European Union there are about 18 million people unemployed. In most countries unemployment has been increasing from one economic cycle to the next. According to the surveys, a further 9 million people are not registered as unemployed, but would be willing to sign up for a job if labour market prospects improve. The average participation rate in Europe is around 60 per cent, compared with more than 70 per cent in the United States and Japan. Furthermore, half of the unemployed have been out of work for more than a year and the majority of them have low educational levels.

Welfare systems are often indicated as amongst the main culprits for the unemployment development. Present European welfare programmes were created for labour markets with one male breadwinner, working in manufacturing or construction, and where unemployment was low and essentially cyclical. Most benefit systems have been designed for situations where the need for benefits is infrequent and of limited duration. Second, they have been designed for a population where participation rates were high and people could expect an uninterrupted working life. This picture does not correspond with that of the present labour market. There is more diversity in working and family patterns than in the days when benefit systems were introduced. The unemployment level is higher and unemployment spells have become longer, part-time work has increased, short-term contracts are more frequent, participation rates of men have declined and those of women increased. These current and foreseeable features of the labour markets and economic environment are gradually undermining elements of tax and benefit systems.

Tax and benefit systems failures can also be caused by the fact that the welfare systems were designed and introduced one at a time in the first half of this century. While each one of the schemes might be well designed for its specific purposes, the interplay in a more complicated world with other programmes, notably with taxes, has proven not to work in a controlled and desired way. The individual schemes were often also amended without controlling the ultimate outcome after the intervention of other systems. So, the existing programmes may include unplanned and undesired features which weaken the overall coherence and functioning of tax and benefit systems and give rise to wrong behavioural incentives. The potential distortionary effects on the functioning of the labour market arising from the lack of adjustment of welfare systems to structural changes of labour markets may well result in an increase in the equilibrium rate of unemployment.

Work incentives and tax-benefit systems

Several factors influence the performance of the labour market. Amongst these factors, beside the quality of the educational system and the effectiveness of active labour market measures, the parameters of the general transfer systems and the tax rates have important effects on both labour demand and labour supply.

As to the demand side of labour market, the tax system has effects on the overall labour demand. Non-wage labour costs like employers' social security contributions provide a clear disincentive to hiring workers. This is, however, only one way in which taxes affect the demand for labour. All taxes drive a wedge between the cost of labour to the firm and the return (in terms of consumption) to the employee from working. This tax wedge includes income taxes, social security contributions and all consumption taxes. These taxes raise the price of labour and thereby affect the labour demand.

The overall tax wedge has been increasing in European countries. The problem caused by a large and growing tax wedge has been recognised in many countries. Most countries have been seeking ways to reduce the tax wedge, but this has proved to be extremely difficult because of the financial requirements of benefits and welfare services. As a second-best solution, the structure and shape of the composition of taxes has offered possibilities to partial reforms like reducing employers' social security contributions for all or targeted groups of workers, reshaping the structure of contributions, and broadening the contributions' base. The measures taken have often been directed to alleviate the hiring of certain groups like low-paid workers, long-term unemployed, young or disabled people.

The supply side of labour market is affected by tax and benefits systems through their impact on economic incentives for work. As regards the tax and benefit system, there are two elements affecting labour supply: the benefit level in relation to earnings - captured by the so-called replacement rates -, and the increase in disposable income when earnings rise - the so-called marginal effective tax rates. The first relates to the so-called unemployment trap and the second to the poverty trap (OECD 1996a).

The unemployment trap is defined as a situation where benefits paid to the unemployed and their families are high relative to earnings, and more precisely, when disposable income gained from benefits is high relative to that gained from work so that working "does not pay". A high benefit level reduces the economic incentive to move from unemployment to paid employment or can push individuals, especially those at a lower wage level, to turn to social benefits or to withdraw entirely from the labour market. Benefits are also important in wage setting. Even in the absence of a legal minimum wage, minimum benefit level creates a wage floor, the so-called reservation wage (*i.e.*, the wage level which gives the same living standard as the minimum benefit).

The poverty trap is created when the increase in earnings due to higher work effort does not lead to any, or leads only to a small, increase in disposable income due to higher tax rates and to withdrawal of benefits. This is measured as marginal effective tax rates (METR) which take into account both the increase in taxes and the reduction

in benefits. The existence of high marginal taxes hampers the performance of the market through a substitution effect: the incentive to increase supply of labour, whether as additional working hours or as efforts improving quality of labour, is reduced because the after-tax wage falls and the opportunity cost of leisure goes down. The disincentives to acquire better qualifications of labour can decrease vocational and geographical mobility.

All in all, unemployment benefits may have the following negative effects on the functioning of labour markets and social welfare:

- They may increase the duration of unemployment by helping the unemployed to finance their job search. Usually, in insurance schemes, workers need not accept a job offer if they deem it unsuitable. Especially, if the job offered would yield only a small increase in income, the financial incentive for a worker to return to work might be too low and encourage the search for something better.
- They may increase the frequency of spells of unemployment by making seasonal and other temporary employment patterns more attractive. In fact, unemployment benefits make the financial rewards of such unstable jobs higher than would occur otherwise. The subsidy reduces the costs associated with such labour. Employers therefore, have little incentive to change existing hiring patterns.
- They may affect labour force participation, inducing inactive people in the labour force to search for a job and enter the labour force. The impact of increased labour force participation is likely to extend the average duration of unemployment because of the difficulty encountered in finding jobs by those individuals who would otherwise be discouraged or not really interested in finding a job.
- Finally, they may alter incentives in wage bargaining as workers will be less wary of pushing up wages and thus risking their jobs.

The acknowledgement of possible work disincentives, arising from generous unemployment insurance systems, and the fear that they may have played an important role in high and persistent European unemployment in the 1980s, gave rise to a great deal of attention, and the debate highlighted the conflicting principles underlying policy in this area. On the one hand, social security should guarantee a reasonable level of income to those out-of-work; on the other hand, it should not be provided in such a way that people have little incentive to seek or accept jobs.

Purpose of the analysis

In order to analyse the impact of unemployment benefits on unemployment, a number of studies have compared the level of the out-of-work disposable income with the in-work disposable income. Several methodologies have been and can be applied in order to assess the living standard during unemployment compared to that in employment.

One approach is to calculate so-called replacement rates. Having regard to the working of tax and benefit systems, one has to compare disposable income gained from benefits with that gained from work. This means that, in addition to an exchange of wage into unemployment benefits, the reaction of tax and other benefit, notably means-tested, schemes has to be taken into account. Assuming “in-work” situation as a starting point, this analysis allows to be computed *ex ante* replacement rates. Calculations for stylised households assuming a given set of wage levels and family types can illustrate the shape and structure of replacement rates over an income range for various family types. Nevertheless, this method cannot reply to questions on average or most common replacement rates. For this purpose, representative statistics on people’s economic situations are needed.

A simple statistical way to compare the living standard of unemployed and employed persons or families is provided by household surveys, as they provide information on the disposable income of various types of families. This approach provides an empirical analysis showing what income levels people in different labour market states actually receive.¹ The ratio of disposable income between unemployed and employed households can be interpreted as the statistical equivalent to net replacement rates, even though it compares different households in different situations and not the same households in different labour market situations.

Microsimulation models based on empirical data offer the most advanced way to tackle the measurement problem. This approach is close to that of stylised household calculations. However, when based on a representative sample of actual individuals, it provides additional information on the average level and distribution of replacement rates by various characteristics of households. The net replacement rates can be computed to the employed by changing their labour market status, *i.e.*, assuming that they become unemployed and then calculating the unemployment and other (means-tested) benefits according to their entitlement as well as their new taxes (*ex ante* analysis). Respective calculations can be made for the unemployed as well, assuming that they become employed at the same wage from which their prevailing unemployment benefit was defined. This wage and inherent taxes and benefits can be recalculated.

This study will analyse the living standard of unemployed individuals in comparison with those in work. It compares various approaches to compute net replacement rates and discusses their advantages and disadvantages. Furthermore, it aims to find empirical evidence as to whether high net replacement rates, which have been found by stylised calculations, are relevant in practice as well, and as to whether the average disposable income of the unemployed corresponds to the net replacement rate of an average or low-paid production worker.

Part I of this study compares earlier studies of net replacement rates for stylised households. The approach of stylised calculations describes the structures and levels

¹ Sometimes this actual ratio is referred as *ex post* replacement ratio. However, in literature the *ex post* replacement rate is used to mean the ratio between benefit income during unemployment and the post-unemployment wage income. Therefore, we prefer to use the concepts of stylised and empirical replacement rates in order to describe differences in approaches.

of tax and benefit schemes. In order to make these descriptions internationally comparable, a number of studies have adopted a so-called 'Average Production Worker' wage level as the benchmark. The approaches and results of three different studies are compared, namely those of the Seven Countries Group, the Central Planning Bureau of the Netherlands and the OECD.

Part II consists of empirical studies. The European Community Household Panel survey offers a new framework for international comparisons. The Commission services have used the first wave of this data in two different studies in order to find evidence for the net replacement rates found in stylised calculations. The results of these studies are compared here. Moreover, the chapter makes reference to a Swedish study on net replacement rates in which empirical data and microsimulation model approach have been combined. Finally, in the conclusions the results of various approaches are tentatively compared and the advantages and disadvantages of various approaches are assessed.

Annex A makes a reference to the literature on the analyses of the impact of unemployment benefits on unemployment.

I STUDIES BASED ON STYLISED CALCULATIONS

I.1 OECD, Seven Countries Group and Central Planning Bureau: Net replacement rates for stylised household types

Only a few studies have tried to accomplish comparisons of unemployment benefit replacement rates among different countries. First, comparative studies have been carried out by a group of national experts (Seven Countries Study) and the Central Planning Bureau in the Netherlands (CPB). Subsequently, the OECD has started to regularly calculate net replacement rates for stylised households covering a larger set of countries. In all these studies the structure of benefit and tax systems and the outcome of their interaction is analysed under the legislation in a given date and assuming that the benefit and tax rules are applied as they stand in the legislation.

The common feature of the studies presented further on is that all calculations have been carried out with an *ex ante* approach: stylised family types entitled to protection of the welfare systems in a reference year have been defined, and the potential replacement income has been calculated in a standardised way, in both gross and net terms thus taking into account income taxation. In other terms, the basic assumption in these calculations is that one works at a certain wage level and, in the second phase, the person becomes unemployed and begins to receive the unemployment benefit he/she is entitled to and possibly other means-tested benefits. Moreover, for the disposable income of households, the family benefits, housing allowances and other means-tested benefits have been recalculated as they are determined on the basis of gross income in each case.

Net replacement rates are defined in all the studies considered as the ratio of disposable income when unemployed to the disposable income when in work (out-of-work income to in-work income). They have been calculated for a number of typical cases, choosing as a benchmark for comparisons the OECD's 'average production worker' (APW), and calculating the replacement rates for a selection of family types based on an income range below and above the APW (e.g. a single APW, a couple with one APW and a dependent spouse, a couple with both partners being APW, or one APW and the other 1/2 APW, one APW-couple with children, etc.). The replacement rates then measure the percentage of previous earnings that each of these family types will receive in case of unemployment.

As to the concept of gross income, they all refer to the one used in 'The tax/benefit position of production workers' (OECD 1995). It says that the average wage of a production worker in each country has been chosen as the benchmark of income level and the income range investigated is related to the average wage level. To describe the economic position of an unemployed person in comparison with an employed one, disposable income is then calculated in a standardised way across countries: average

wages or gross unemployment benefits, standard deductions and allowances in the taxation system as well as inherent means-tested benefits are involved. However, there are differences in details on how exactly and upon which assumptions the disposable income has been calculated, e.g., concerning housing costs and benefits and payments for day care for children. The OECD and CPB studies strictly follow the usual definition of disposable income, i.e., housing benefits are included as means-tested benefits but no deductions are made on the basis of necessary consumption like moderate housing costs or childcare payments. Instead, the Seven Countries Study applies a “Family purse” concept of the disposable income. It differs from the usual disposable income as it reduces the moderate housing costs and measures the disposable income which can be regarded as room for free-choice consumption. Additionally, for some countries, “Family purse” income has been calculated after childcare payments (net of subsidies).

I.1.1 OECD

In 1996, a Thematic Review of OECD (OECD 1996a) on the interactions between taxes, benefits, employment and unemployment highlighted how some existing features of tax and benefit systems can cause labour market disincentives, failing thus to “make work pay”. Three failures of tax and benefit systems were given particular attention: the unemployment trap (disincentives for the unemployed to search for a job), the poverty trap (people on low incomes receiving benefits are discouraged to make any additional work effort), and the high labour costs (discourage hiring). The examination of net replacement rates aims to study the first failure, namely the unemployment trap.

For the purpose of our analysis, the OECD studies are of particular interest (OECD 1997 and 1996b, Martin 1996). The most recent one for 1995 presents the replacement rates for 18 OECD countries. All replacement rate calculations are based on the level of previous earnings defined with reference to the Average Production Worker (APW), taking as the two most significant cases the APW level of earnings and two thirds of the APW level of earnings. The calculations are made for the most common family types.

The scope, process and assumptions of the calculations are the following. The family types are defined as single versus couple, and in the case of a couple, one versus two earners and with children versus without children, with the standard assumption that the benefit recipient is 40 years old and has been continuously employed and contributing to the unemployment insurance fund since the age of 18; moreover, the individual is assumed to receive the benefit for the length to which he/she is legally entitled, implying that he/she satisfies the necessary requirements for entitlement. Replacement rates have been calculated gross (before-tax) and net (after-tax); different net replacement rates have been calculated according to the inclusion of benefits other than unemployment benefits (housing benefits, child allowances, family benefits, etc.). Different calculations have been made for the first month of

unemployment and for the 60th month of unemployment. Where in the case of the 60th month of unemployment the level of social assistance is higher than that of unemployment benefit, and where the unemployed family would be entitled to have it, social assistance is assumed to be paid on top of the primary benefit.

The calculations for 1994 and 1995 give the same overall picture. However, several revisions have been made in calculation formulae, as well as more countries have been included in the study. Thus, the 1995 calculations represent a more established approach.

Table 1a **OECD, 1994: Net replacement rates for single-earner households**

EU countries	APW level of earnings				
	First month of unemployment			60th month of unemployment	
	Couple, no children	Couple, 2 children	Couple, 2 children, housing benefits	Couple, no children	Couple, 2 children, housing benefits
Belgium	64	66	66	42	70
Denmark	69	73	83	60	83
Finland ¹⁾	63	75	88	25	98
France	69	71	80	36	65
Germany	60	71	78	37	71
Ireland	49	64	64	37	64
Italy	37	47	47	0	11
Netherlands	77	77	84	0	80
Spain	75	75	74	0	46
Sweden ¹⁾	81	84	89	0	99
United Kingdom	35	51	77	25	77

EU countries	Low level of earnings (2/3 of the APW)				
	First month of unemployment			60th month of unemployment	
	Couple, no children	Couple, 2 children	Couple, 2 children, housing benefits	Couple, no children	Couple, 2 children, housing benefits
Belgium	75	76	76	55	91
Denmark	92	93	95	86	95
Finland ¹⁾	67	83	89	37	100
France	79	81	88	54	83
Germany	60	70	77	39	80
Ireland	67	70	70	66	70
Italy	36	45	45	0	14
Netherlands	79	78	84	0	95
Spain	74	78	77	0	66
Sweden ¹⁾	82	85	89	0	121
United Kingdom	52	67	90	38	90

1) Finland and Sweden joined the European Union in 1995.

Table 1b **OECD, 1995:**
Net replacement rates for single-earner households
APW level of earnings

EU countries	First month of unemployment			60 th month of unemployment		
	Single	Couple, no children	Couple, 2 children	Single	Couple, no children	Couple, 2 children
Austria	57	60	71	54	60	69
Belgium	65	57	60	46	66	63
Denmark	65	68	77	49	77	97
Finland	68	71	87	62	82	100
France	76	74	79	43	43	51
Germany	70	66	80	62	63	73
Ireland	33	49	64	33	49	64
Italy	36	42	47	0	4	11
Luxembourg	86	86	90	54	66	77
Netherlands	75	81	82	60	76	78
Portugal	79	78	77	0	0	6
Spain	73	74	76	27	33	46
Sweden	75	75	85	62	83	100
United Kingdom	52	63	67	52	63	76
Non-EU countries						
Australia	37	50	72	37	50	72
Canada	61	63	68	27	44	59
Czech Republic	54	76	77	36	63	98
Hungary	67	67	74	47	47	59
Iceland	55	46	59	52	54	80
Japan	63	61	59	35	49	71
Korea	55	55	54	10	10	10
New Zealand	37	41	64	37	41	64
Norway	66	67	73	39	..	68
Poland	34	36	42	30	29	35
Switzerland	77	77	88	52	64	68
United States	58	60	59	7	13	51

Table 1b cont.**Low level of earnings (2/3 of APW)**

EU countries	First month of unemployment			60th month of unemployment		
	Single	Couple, no children	Couple, 2 children	Single	Couple, no children	Couple, 2 children
Austria	57	62	77	54	59	74
Belgium	84	76	76	78	90	91
Denmark	90	94	95	68	98	80
Finland	83	86	92	84	100	100
France	85	85	87	57	56	58
Germany	73	74	76	76	87	92
Ireland	45	64	72	45	64	72
Italy	35	42	46	0	6	14
Luxembourg	85	85	91	75	89	89
Netherlands	86	90	86	85	95	96
Portugal	89	88	87	0	0	8
Spain	71	71	73	37	47	63
Sweden	78	78	85	89	116	122
United Kingdom	75	88	80	75	88	91
Non-EU countries						
Australia	50	67	82	50	67	82
Canada	61	64	68	38	60	77
Czech Republic	60	74	76	53	91	100
Hungary	86	86	90	64	64	74
Iceland	73	66	81	69	78	109
Japan	72	69	67	51	71	87
Korea	54	54	53	15	15	15
New Zealand	52	71	77	52	71	77
Norway	65	67	75	56	96	78
Poland	49	52	61	42	42	51
Switzerland	76	76	88	74	92	96
United States	59	59	50	11	18	58

The net replacement rates differ significantly among countries. However, some common patterns can be identified:

- Taxation and means-tested benefits mean that the net replacement rates are invariably higher than gross replacement rates, with the difference being particularly large when benefits are not taxed.
- Where existing, housing benefits can change considerably the rates.
- In all countries, except in Belgium and Portugal, net replacement rates are higher for families with children than for those without children, often due to higher or additional benefits paid to families with children. Similarly, earners with a dependant spouse tend to have higher net replacement rates than single persons.
- Net replacement rates for low-income families (at 2/3 APW earnings level) are significantly higher in some countries (Belgium, Denmark, Finland, Ireland,

Portugal, UK) and at about the same level in some other countries (Austria, Germany, Italy, Luxembourg, Spain, Sweden) than for those at average earnings level.

- Net replacement rates for low-income families (single persons and couples without children) are below 70 per cent only in Austria, Ireland and Italy in the EU, and for the family type with children only in Italy.
- After 60 months, unemployment benefits are lower than in the 1st month of unemployment in some countries (France, Spain) or not paid at all to families without children (Italy, Portugal). In the majority of EU countries (10 out of 15), the net replacement rate for a single person at average wage level is lower in the 60th than the 1st month of employment, but less so for low-wage earners and families with children.
- In many countries social assistance eligibility results in higher net replacement rates than unemployment benefits, especially for families with children. In Belgium, Finland, Germany, Netherlands, Sweden and the United Kingdom, the net replacement rates including social assistance (60th month of employment) are higher for low-paid families with children than in the 1st month of unemployment (social assistance not included).

I.1.2 Seven Countries Group

The Danish and Dutch authorities co-ordinated a comparative study on unemployment benefits and social assistance in seven European countries (the so-called Seven Countries Study, including Denmark, Finland, France, Germany, the Netherlands, Sweden and the United Kingdom).² The study presents a standardised description of tax and benefits rules, as well as standardised calculations of net replacement rates in stylised cases of various family types and income levels. The national experts from each participating country combined their efforts in order to agree upon a common methodology and to carry out the necessary calculations by themselves in each country. This was considered to ensure good international comparability and high quality of data, together with in-depth understanding of national circumstances.

More specifically, the countries involved calculated the actual gross and net income support which unemployment would provide in the contingency that one member of the household falls unemployed.³ In some countries the social assistance forms a norm of the social minimum and guarantees a subjective right to that level of income maintenance. In the case where it gives a higher level of assistance than the

² Seven Countries Group (1995), “Unemployment Benefits and Social Assistance in seven European Countries”, Werkdocumenten No. 10, Ministerie van Sociale Zaken en Werkgelegenheid, The Netherlands

³ Replacement rates of social assistance, which represents the minimum out-of-work income, were also calculated. The respective net replacement rate shows the level of social minimum relative to the in-work disposable income at the chosen prevailing wage levels. The net replacement rates of social assistance were compared with those of unemployment benefits.

unemployment benefit, it is included as means-tested benefit in the calculation of net replacement rate of unemployment benefit as well. Complementary housing benefits less housing costs and children allowances are taken into account when and where applicable. The disposable income is defined as “Family purse” income indicating that necessary housing costs are deducted. Respectively, the net replacement rates show the economic living standard after the housing costs when unemployed relative to that when working.

Gross and net replacement ratios have been calculated for eight family types (viz., single person, one-earner couple, two-earners couple, single parent with two children, one-earner couple with two children, two-earners couple with two children, young person living alone and young person living with parents) and for six income levels ranging from half to double the wage level of the average production worker (that is, 0.5, 0.675, 0.75, 1, 1.5 and 2 APW level). This income range can be estimated to cover the essential wage dispersion. For instance, in Finland and Sweden, where distribution data were available, over 90 per cent of full-time wage earners were within these limits. The calculations of benefits and disposable income are based on information of the unemployment, other benefit and tax schemes in 1994.

Table 2 **Seven Countries Group, 1994:**
Net replacement rates for one-earner households

	APW level of earnings				
	Single			One-earner couple	
	No children	2 children	2 children, incl. child care costs ¹⁾	No children	2 children
Denmark	58	79	88	61	65
Finland	53	86	90	75	96
France	64	68	-	65	79
Germany	44	64	-	46	71
Netherlands	65	67	70	66	69
Sweden	71	87	93	68	83
United Kingdom	21	44	-	34	58

	Low level of earnings (67,5% of APW)				
	Single			One-earner couple	
	No children	2 children	2 children, incl. child care costs ¹⁾	No children	2 children
Denmark	85	95	97	88	89
Finland	64	89	89	100	100
France	80	82	-	78	89
Germany	45	89	-	73	95
Netherlands	60	78	84	86	88
Sweden	70	86	91	64	80
United Kingdom	34	65	-	54	86

Table 2 cont.**High level of earnings (200% of APW)**

	Single			One-earner couple	
	No children	2 children	2 children, including child care costs ¹⁾	No children	2 children
Denmark	29	52	53	32	40
Finland	41	62	65	38	63
France	64	60	-	62	69
Germany	44	49	-	43	51
Netherlands	49	51	54	51	54
Sweden	36	57	61	32	50
United Kingdom	10	21	-	16	27

1) The children are assumed to be 3 and 8 years old, full day care is provided for the youngest child.

The main conclusions of these calculations are:

- Replacement rates for unemployed vary considerably between countries, family types and income levels, *e.g.*, for a single person at average wage level from 21 per cent in the United Kingdom to 71 per cent in Sweden.
- In all countries, replacement rates in many cases are above 80 per cent or even exceeding 100 per cent in the lower end of the income scale, which might influence work incentives.
- In most countries, having a dependant spouse does not change substantially the net replacement rates, the only exceptions being Finland and the United Kingdom where the differences reach more than ten percentage points, and in Germany for low-income households where the difference reach almost 30 percentage points.
- In all countries, benefits for unemployed favour families with children, thus giving them higher replacement rates. The most striking differences are seen in Germany, Finland and the United Kingdom; couples with children have higher replacement rates than single parents except in Denmark and Sweden.
- Families that are exempted from day care costs when unemployed can even be better off receiving benefits rather than working, which indicates severe damage to work incentives.
- In some countries families with children have very high reservation wages. Families need an income close to or above the level of the average production worker in order to be better off than when receiving benefits.

I.1.3 Central Planning Bureau

The Central Planning Bureau of The Hague developed for the Commission services a tax-benefit model enabling the estimation of, on one side, the social contribution and taxes payable by individuals at different levels of gross earnings, and on the other side, the unemployment benefit or social assistance receivable by the same individual in case of unemployment. Through the calculation of replacement rates, the study allows an overview to be obtained of the income position of unemployed workers for the EU Member States and three states of the US with reference at the 1 July 1993.⁴

The replacement rate is defined as disposable income when in work relative to disposable income when unemployed, including housing benefits (costs such as housing costs, the cost for childcare, travel to and from work or working expenses are not considered). As to the numerator of the ratio, benefits from unemployment insurance for employees in the private sector, unemployment assistance and general needfulness are considered. As to the denominator, earnings of blue-collar workers are considered. The average gross wage of a manual worker in industry, as estimated by the OECD, has been taken as the benchmark against which to compare replacement rates in different Member States and to assess the way that these change as earnings and family circumstances vary.

Replacement rates have been calculated for three kinds of households: single persons, married couples without children and married couples with children; in the case of married couples, it is assumed that only one spouse is in employment. As in the OECD study, the person is assumed to be 40 years old, but with only ten years of work record (as against 22 in OECD). Different replacement rates are also calculated according to the duration of unemployment (at various stages of unemployment, from the initial situation to that which occurred after 60 months of unemployment).

The results are presented in Table 3 at the minimum wage level and at the APW one, in each case for three stylised types of single-earner households and for the 1st and 60th month of unemployment.

⁴ Central Planning Bureau (1995), Replacement Rates – A Transatlantic View, CPB Working Paper, No 80, The Netherlands

Table 3 Central Planning Bureau, 1993:
Net replacement rates for single-earner households

	AWP earnings level					
	First month of unemployment			60th month of unemployment		
	Single	Couple, no children	Couple, 2 children	Single	Couple, no children	Couple, 2 children
Belgium	67	59	63	47	59	66
Denmark	80	88	87	80	82	87
France	80	78	80	47	56	65
Germany	61	63	74	55	59	69
Greece	48	50	55	7	8	10
Ireland	44	59	74	44	59	74
Italy	56	62	66	28	44	63
Luxembourg	85	84	89	45	62	77
Netherlands	74	79	82	57	73	77
Portugal	79	77	76	0	0	5
Spain	84	79	77	23	29	41
United Kingdom	41	54	70	41	52	70

	Minimum wage level					
	First month of unemployment			60th month of unemployment		
	Single	Couple, no children	Couple, 2 children	Single	Couple, no children	Couple, 2 children
Belgium	77	81	81	65	81	85
Denmark	95	96	97	95	96	97
France	89	89	90	63	78	88
Germany	79	97	112	79	97	112
Greece	79	79	89	12	12	16
Ireland	73	93	115	73	93	115
Italy	79	83	87	43	63	87
Luxembourg	89	103	102	79	90	92
Netherlands	85	100	10	85	100	100
Portugal	112	112	111	0	0	10
Spain	107	107	106	47	61	81
United Kingdom	80	89	86	79	86	86

The main conclusions of these calculations are:

- Generally, at the minimum wage level, income loss was minimal in the case of becoming unemployed, because of the minimum assistance levels set. In two countries (Portugal and Spain) there was no income loss for any family type, or in many other countries (Germany, Ireland, Luxembourg, Netherlands) for families with children in the first month of unemployment. In the majority (7 out of 12) of

the European countries examined, the average income loss was less than 10 per cent, and over 20 per cent only for single person households in some countries.

- After 5 years of unemployment, in a good half of the countries considered, the net income dropped substantially for single persons but only in Greece, Portugal and Spain for families with children. The remaining countries preserved about the same income level.
- In general, having a dependent spouse does not change the amount of gross wage or unemployment benefit; however, often special tax advantages and higher housing benefits are available for sole earners; in addition, the amount of general needfulness is often higher for these households.
- For couples with children replacement rates are even higher; tax advantages, child benefits, additional assistance, etc. lead to higher disposable incomes; especially low income profit by these instruments.

1.2. Comparison between net replacement rates for stylised households

The net replacement calculations for stylised households use similar approaches and are methodologically comparable. However, there are differences in detailed assumptions and the years considered are not exactly the same. Both of these factors are likely to induce slightly different results, but one can assume that the overall picture should be similar. The most essential differences between these calculations concern the treatment of housing costs and benefits, the possible topping-up of social assistance, and the selection of the low-wage level.

The OECD and CPB studies apply the general disposable income concept, *i.e.*, including housing benefits but without deducting housing costs, whereas the Seven Countries Group applies a wider disposable income definition, *i.e.*, so-called “family purse” income which is measured including housing benefits and deducting moderate housing costs. Here, the assumption of “moderate” housing costs, which were slightly different between countries, additionally affects the final outcome⁵. The OECD and CPB studies assume that social assistance is not granted during the first month of unemployment and the possible topping-up of social assistance is included only in the calculations of the net replacement rates for the 60th month of unemployment, whereas the Seven Countries Group includes also social assistance in the net replacement rate for the first month’s unemployment. The low-wage level is interpreted as two thirds of the average wage level in the OECD and Seven Countries Group studies, whereas as the minimum wage in the CPB study.

⁵ See Eight Countries Group (1997), “Note on methodology: The Importance of Housing Cost Assumption” in the report “Income Benefits for Early Exit from the Labour Market in eight European Countries”, Werkdocumenten No. 61, Ministerie van Sociale Zaken en Werkgelegenheid, The Netherlands

There are significant variations in the replacement rates of different family types in all countries, implying that one could weight them differently to compute an alternative summary measure. For instance, instead of taking a simple average of all the replacement rates, an alternative approach would be to weight them in line with the actual demographic, family and duration composition of unemployment in each country. However, using population weights also implies problems, namely, that the population sizes respond to incentives in benefit systems and thus potentially give rise to bias in the summary measure. Here, for comparison of different stylised calculations, a simple average of the first month's replacement rates for three different family types (single person, couple without children, couple with two children) has been opted for.⁶

Table 4 Summary measure of net replacement rates in the first month
Of unemployment

EU countries	APW wage level			Low wage level		
	OECD	CPB	Seven Countries	OECD	CPB	Seven Countries
	1995	1993	1994	1995	1993	1994
Austria	63	..	..	65	..	..
Belgium	61	63	..	79	80	..
Denmark	70	85	61	93	96	87
Finland	75	..	75	87	..	88
France	76	79	69	86	89	82
Germany	72	66	54	74	96	71
Greece	..	51	..	..	82	..
Ireland	49	59	..	60	94	..
Italy	42	61	..	41	83	..
Luxembourg	87	86	..	87	98	..
Netherlands	79	78	67	87	95	78
Portugal	78	77	..	88	112	..
Spain	74	80	..	72	107	..
Sweden	78	..	74	80	..	71
United Kingdom	61	55	38	81	85	58

Note: The summary measure of net replacement rates has been calculated as a simple average of the net replacement rates for three family types (single earner, couple without children and couple with two children).

Low wage level is the minimum wage in CPB study and in others two thirds of APW wage level.

In summary, the different calculations of net replacement rates of unemployment benefits lead to broadly similar conclusions. While there are more differences between the levels of various calculations, the country rankings are strongly correlated. The comparison of figures allows the distinction to be made between groups of countries with - arbitrarily defined - high, intermediate and low replacement rates. The high

⁶ There are significant differences in the weights of different household types across countries, thus implicating also differences in family patterns. For instance, the share of single person households varied between 20-50 per cent, couples without children between 20-30, and couples with children between 20-50 per cent in European countries (OECD 1997b).

replacement rates are noticed in Luxembourg, Netherlands, Denmark, Finland, Sweden, France and Portugal. Intermediate replacement rates are found in Austria, Belgium, Germany, Spain and the United Kingdom and the low replacement rates in Greece, Ireland and Italy.

A more detailed comparison between OECD and CPB figures shows that the net replacement rates tended to be higher in CPB than in OECD calculations, with the exceptions of Germany and United Kingdom and with a number of exceptions for the family type of a couple with two children.

The calculation of net replacement rates at minimum wage level (CPB) provides additional information, because it is a stricter condition than a low wage level in the OECD calculation. In many countries, the net replacement rates at minimum wage level, especially for families, exceeded the income from minimum wage; in Portugal and Spain, also a single person was better off on benefits than on minimum wage. The results concerning net replacement rates at the minimum wage level should be interpreted with regards to the minimum wage level relative to average wage level, which differ markedly between countries.⁷ Notably in Portugal, Spain, Ireland and Italy, the net replacement rates were far above those for two thirds of APW wage level calculated by OECD.

The replacement rates by Seven Countries Group were, in general, clearly lower than those in the OECD calculations, mainly due to the fact that moderate housing costs were deducted from the disposable income of households. For families with children, especially in Finland, Germany and the UK, the rates were, however, higher, due to the topping-up of social assistance having been taken into account. In general, the ranking order of countries according to replacement rates was largely the same in these two studies.

⁷ According to OECD Study, the minimum wages relative to the full-time mean earnings in 1997 ranged from about 30 per cent (in Spain) to 55 per cent (in France) in a group of EU countries. See “Making the Most of the Minimum: Statutory Minimum Wages, Employment and Poverty”, in OECD Employment Outlook 1998

II STUDIES BASED ON EMPIRICAL DATA

II.1 Comparability of approaches

The above studies were based on stylised household calculations looking at entitlements. Here, further on, empirical approaches to calculate net replacement rates on the basis of empirical data are applied. It should be stressed that although the methodologies are completely different, the aim is to capture the same phenomena, namely the comparison of living standards when employed and unemployed.

Usually, when economic conditions in two different labour market situations are studied, the aim is to compare the same person when he/she is employed and unemployed. When the comparison is made for stylised households, it is expected that people use every opportunity that the tax and benefit systems offer. Hence, the calculations describe which mechanisms are built in the tax and benefit schemes and how they are designed to work. Empirical studies have the advantage that the data have statistical relevance and tell us to which extent people use the opportunities of benefit schemes, and thus, they provide a picture of the economic living standard when people are either employed or unemployed. However, if the data are not longitudinal, they often fail to follow the same person in different labour market situations and, instead, one has to compare two different groups in different labour market situations.

Nevertheless, it is interesting to compare the results from empirical and simulation studies. Primarily, one would like to know whether the tax and benefit systems work as they are designed to. Second, even though one can assume that the results cannot give the same figures in detail, one is interested to know whether they give the same overall picture of differences between countries.

One question which often arises is whether the calculations of net replacement rates for stylised households are representative of real life situations. By definition, they present results for certain family types with given income levels and thereby illustrate the functioning of tax and benefit systems in a simplified manner. A more complete set of calculations for different family types and income levels can illustrate the variation, but it is not easy to sum them up into one “average” figure which would give an overall picture of the systems. Moreover, people might not always be entitled to benefits or do not take up all benefits as easily as it is assumed in simulation calculations. Furthermore, the multiplicity of family and labour market situations makes it difficult to capture all features in stylised calculations. For instance, part-time work, short employment spells and additional costs related to work may draw too little attention in stylised calculations. Some assumptions like full exploitation of tax-benefit systems are likely to over-estimate the net replacement rates, whereas some others like disregard of short unemployment spells and part-time work tend to underestimate them. All in all, the picture may be regarded as being too simplified.

Therefore, the empirical studies complement the picture of net replacement rates. First of all, they can better capture the variety of family and labour market situations. Moreover, assuming that the data is complete, they can produce useful information on take-up rates of benefits in situations where people should be eligible to receive benefits. Simultaneously, however, comparison difficulties also arise. The comparable groups are different and it is not easy to take control over the differences in the groups compared.

The following chapter reports on a study carried out by the services of DG II. It is based on the European Community Household Panel data and aims to find out whether the net replacement rates calculated for stylised households correspond to the economic living standard of the unemployed in relation to that of the employed in actual life. In this study the investigated populations are the whole actual population of the unemployed and that of the employed during one reference year.

Another analysis based on the ECHP data carried out by the DG V services with similar aims but different populations is briefly referred to in the next chapter. This study is confined to the population which was both unemployed and employed during the reference year. The living standard during unemployment months is compared with that during employment.

Furthermore, reference is made to a Swedish simulation experiment applied to a large sample population. It provides a further methodological step in attempts to calculate actual net replacement rates for actual individuals in empirical data. This approach succeeds in avoiding distortive effects of hypothetical calculations of replacement rates for over-simplified household types. Simultaneously, it produces a far better picture, both of the average measure of the rates and their effective distribution, and thereby better captures the real incidence of the “unemployment trap” problem. Moreover, this study offers an interesting reference of how simulation results matched with those of statistical comparisons.

II.2 A Study based on the European Community Household Panel (ECHP)

II.2.1 The methodology

II.2.1.1. Data

The basis of this analysis is the rich microeconomic data collected in the European Community Household Panel (ECHP), designed by EUROSTAT in close consultation with member states⁸. The first wave (1993) of the panel survey provides information

⁸ See ECHP documentation, e.g. European Commission (1996), “ECHP Wave 1 documentation,” Doc. Pan 15.2.1996, EUROSTAT, and “The European Community Household Panel (ECHP): Survey Methodology and Implementation, Volume 1”, EUROSTAT

on the social dimension of 12 member countries in the European Union. The ECHP is a multi-dimensional and multi-purpose survey, which covers income, demographic and labour force characteristics, health, education, housing, migration and other topics.

ECHP is a panel survey and, in the future, this design allows one to follow the same individuals over time: in this way, it will be possible to have longitudinal analysis in aiming at identifying people's experiences due to changes in socio-economic conditions and policies and studying their reactions to these changes. For this purpose, the survey is intended to be updated every year with a different *wave*. However, due to data availability during this study, the following tables and analysis are based only on the results of the first wave, which has a sample size of 61,106 households (with around 127,000 individuals over 15 years of age) for the 12 EU member states. Thus, this analysis is not expected to overcome the usual disadvantages of cross-sectional data: as the beginning or the end of unemployment spells for a major fraction of unemployed is not observed, the data only provides information on the unemployment spell during the reference year, and the probability of finding a job depends on the state of the business cycle, which cannot be controlled.

II.2.1.2. Definitions of target populations and observation units

Target populations - The analysis will focus on the active population, i.e., people in households of working age. First, a population of individuals belonging to households whose head is of active age (below 65 years) and whose members are available for labour market is defined. Second, a sub-population of individuals belonging to low-income households is formed. This is an interesting group, because unemployment in a low-income household is a greater welfare risk than unemployment in a higher-income household: the living standard during unemployment is low, but at the same time, economic incentives to take up a job, especially a low-paid or part-time job, can be low. This is due to social benefits, which are widespread among the lowest income groups of population, and which can easily exceed the earnings of part-time work or which often are withdrawn if the benefit recipient has his/her own earnings. The target populations are defined as follows.

- **All households:** All households whose head is of working age, i.e., under 65 years and whose members are at the disposal of labour markets. This means that households whose largest source of income is any kind of pension (old-age, survivor or invalidity) or income from investment, savings or property are excluded.
- **Low-income households:** Sub-group of the above defined active households whose disposable income is less than two thirds of the average household disposable income.

Observation units – The key observation unit in this analysis will be the individual, whether employed or unemployed. However, in order to simplify the analysis and to compare the regular income in- and out-of-work, only dependant workers are taken into account. The self-employed and unpaid workers in family enterprises are not taken into consideration, because their income includes irregularities and elements other than compensation of work. Also the apprentices and trainees are excluded because their labour market status is not yet established.

In order to form the relevant sub-groups for analysis purposes, the target groups are formed from the employed or unemployed individuals in the above defined target households. Thus, this analysis requires ‘matching’ data of both the household and the individual files.

The groups in relation to which the main variables are analysed are the following:

- **Employed in all active households:** all individuals over 15 years who receive an income from paid work.
- **Unemployed in all active households:** all individuals over 15 years who are unemployed, at the time of the interview according to the declaration of the interviewed person.
- **Employed in low-income active households:** all individuals over 15 years who receive an income from paid work and belong to the low-income households (i.e. households where disposable income is less than two thirds of the average household disposable income).
- **Unemployed in low-income active households:** all individuals over 15 years who are unemployed and belong to the low-income households.

II.2.1.3. In- and out-of-work income

The comparison is made between employed and unemployed individuals with the same characteristics, assuming that the income that an individual who loses his/her job would receive is the same as that received by an unemployed person with the same characteristics (level of household income, sex, age, education, sector of last occupation, etc.).

For the purpose of this analysis the concept of individual net income is defined. It takes into consideration regular income from dependent work (when it is the case) plus all typical benefits that the individual receives. Irregular income from dependent work, income from self-employment, pensions (old-age/retirement, survivors' and invalidity), income from investment, savings or property, or any kind of gift, are not taken into account when calculating the individual income. Family allowances and housing allowances, which in the questionnaire were attributed to the household, were redistributed in each household among all active (i.e., employed or unemployed) individuals. All earnings and benefit amounts are indicated net of possible tax and other deductions already in the questionnaire. This means that if there has been yearly

adjustments in the taxation at the end of the year, these changes have not been taken into account.

The benefits that we analyse are:

- **Unemployment-related benefits:** unemployment insurance benefits, unemployment assistance, training/retraining allowance, placement, resettlement and rehabilitation benefits, other benefits related to unemployment, job creation or training;
- **Family-related benefits:** child allowance (normally given to the mother), allowance for care of invalid dependants, maternity allowance, birth allowance, unmarried mother's allowance, other family-related benefits;
- **Sickness-related benefits:** income maintenance benefits in case of sickness or injury, other sickness benefits, compensation for occupational accidents and diseases, invalidity benefits;
- **Education-related benefits:** scholarships and study grants, other;
- **Housing-related benefits:** housing allowances or subsidies (as they are reported per household, the total amount given to each household is distributed to all active individuals taken into account in our analysis);
- **Last-resort social benefits:** social assistance payments or non-cash assistance from the welfare office (as for housing allowances, the total amount given to each household is distributed to all active individuals).

Unemployment-related benefits are of greatest importance for the purposes of this study. Unemployment benefits⁹ are usually distinguished between insurance and assistance benefits. In order to become eligible for benefits, the status of unemployment is not always sufficient: in the case of unemployment insurance, there are usually contribution requirements and in the case of unemployment assistance, in most member states there is some income testing.

An unemployment insurance benefit scheme is an arrangement by which a person is guaranteed some income on becoming unemployed in exchange for making payments into the scheme. The purpose of Unemployment Insurance is to provide a certain degree of income security in the event of unemployment. If the system works efficiently, it also promotes labour market efficiency by enabling a potential worker to spend a sufficient time searching for a job which matches his skill level (having the right people in the right jobs raises productivity and reduces the chance of them becoming unemployed in the future).

In many European countries, a system of a last-resort **unemployment assistance** has been considered necessary to fill the gaps due to failure to receive an insurance-based benefit. It usually grants minimum level benefits to workers who have exhausted unemployment insurance benefits or who do not qualify for receiving them. Where

⁹ For a detailed description of the features of unemployment benefit systems, see European Commission (1995).

means-testing is applied, it is most often granted to bread-winners with dependants. It is clearly an income redistribution system of equity considerations between the employed and those out of work, whereas the unemployment insurance system rather redistributes income inter-temporally between employment and unemployment periods.

II.2.1.4. Comparison of disposable income between the unemployed and employed

The results of this study rely on the concept of net replacement rate. Here it differs from the usual definition and is used to mean a statistical equivalent for the usual concept. It is represented by the ratio of out-of-work individual net income (disposable income) to in-work individual net income, with the out-of-work income being the total net amount of income that the unemployed receive and the in-work income being the total net amount of income that the employed receive.

For the reasons explained above, this study does not try to assess what would be the in-work income of an unemployed individual in case he/she left unemployment and, hence, the properly defined net replacement rates are not calculated. Instead, we assume that the income that an unemployed individual would receive if he/she found a job is equal to the average income of an employed individual represented in the sample data. In order to compare the above defined net replacement rates, we divide the actual average out-of-work income of the unemployed by the average income of employees.

II.2.2 Main results of the analysis

The results are presented in three sections:

- Section II.2.2.1 displays structural characteristics of target populations and groups. It shows the number and the incidence of unemployment as well as the take-up rates of unemployment benefits in all and low-income households.
- In Section II.2.2.2 average net replacement rates are presented for several subsets of the total population of unemployed individuals and they are calculated as the ratios of the average out-of-work income of a group of unemployed individuals with specific characteristics to the average in-work income of the group of employees with the same characteristics as the group of unemployed. The share of unemployed reaching certain levels of net replacement rates is then represented as the share of that specific subset to the total number of unemployed.
- Section II.2.2.3 describes the variation of the level of the out-of-work income relative to the average in-work income. The shares of the unemployed reaching high, moderate and low net replacement rate levels are presented. Net replacement rates over 70 per cent are regarded as high, those between 50 and 70 per cent as moderate and those less than 50 per cent as low.

II.2.2.1. Structural characteristics

Incidence of unemployment – Combining the results of the ECHP on the unemployed and employed in the member States populations, it was possible to calculate the incidence of the unemployment. This is defined as a percentage of the unemployed in the labour force, where, for the reasons explained above, the labour force is defined as the sum of the unemployed and the employed in dependant work. The results are presented in Table 5, together with similar statistics from the Labour Force Survey, in order to allow for comparisons. Table 6 presents similar results for low-income households only.

Table 5 **Numbers of the unemployed and the unemployment rates**
According to ECHP and Labour Force surveys in 1993.

	All households			
	ECHP survey		Labour Force survey	
	Number of the Unemployed in 1000	Incidence of unemployment, % of the labour force ¹⁾	Number of the Unemployed in 1000	Unemployment Rate, % of the labour force
Belgium	540	14	329	8,1
Denmark	343	13	305	10,9
France	3113	15	2788	11,4
Germany	3081	9	2975	7,7
Greece	617	23	347	8,8
Ireland	248	22	208	15,9
Italy	3874	21	2300	10,4
Luxembourg	7	5	4	2,3
Netherlands	916	16	386	6,3
Portugal	438	12	240	5,5
Spain	3006	25	3388	22,4
United Kingdom	2481	11	2919	10,4
EU 12	18663	15	16188	10,7

1) The labour force is here defined as sum of the unemployed and the employed in dependent work.

According to the ECHP survey, there were 18.7 million unemployed people in 12 Member States in 1993. This figure is 15 per cent higher than the unemployment figure in Labour Force Surveys (16.2 million). Notably in Greece, Italy, the Netherlands and Portugal the differences were unexpectedly large: the ECHP showed approximately double the unemployment figures. The differences are due to different sources, sample bias and definitions. The ECHP survey accounts the number of unemployed at the time of interview according to the declarations of the persons interviewed, whereas the Labour Force Survey investigates unemployment at several fixed points of time in the course of the year and defines unemployment on the basis

of job search and labour market availability. Hence, one can assume that declaring oneself as unemployed in an interview like ECHP does not follow such strict rules, for instance concerning the availability of labour markets, as the Labour Force Survey.

The incidence of unemployment, *i.e.*, the unemployed as a share of the sum of the employed in dependant work and the unemployed, was 15 % on average in 12 Member States whereas the unemployment rate according to the Labour Force Surveys was 10.7 %.

Table 6 Share of individuals, number and share of the unemployed
And the incidence of unemployment in 1993.

	Low-income households			
	Share of individuals in low-income households	Number of the unemployed in 1000	Share of all unemployed	Incidence of unemployment, % of the labour force ¹⁾
Belgium	28	273	51	39
Denmark	22	128	37	52
France	33	1704	55	34
Germany	24	1803	59	30
Greece	33	300	49	53
Ireland	33	151	61	57
Italy	34	2342	60	43
Luxembourg	28	4	61	12
Netherlands	30	436	48	36
Portugal	40	247	56	23
Spain	34	1753	58	52
United Kingdom	38	1873	76	33
EU 12	32	11014	59	37

1) The labour force is here defined as sum of the unemployed and the employed in dependent work in the sub-population of low-income households.

Low-income households were defined as households having less than two thirds of the average household income. Denmark and Germany had the smallest shares of individuals in low-income households, 22 and 24 per cent respectively, and the United Kingdom and Portugal the largest shares, 38 and 40 per cent, respectively. The rest of the countries had a relatively similar figure of around 30 per cent of all individuals. The small share of individuals in low-income households reflects a compressed income distribution. The general picture of the shares of the individuals in low-income households follows in great lines the general perception on overall income differences across countries. Countries with the most equal income distribution had the lowest shares of individuals in low-income households, and vice versa.

The share of unemployed people in low-income households was 59 per cent on average, almost twofold the share of all individuals. In most countries the shares of the unemployed were within the range of 48-61 per cent. Again Denmark with the lowest (37 per cent) and the United Kingdom with the highest figure (76 per cent)

clearly differed from the other countries studied. The greatest concentration due to unemployment in low-income households, measured by the difference (38 percentage points) between shares of the unemployed and all individuals, was found in the United Kingdom, followed by Germany and Luxembourg. But surprisingly, Greece showed the smallest concentration due to unemployment in low-income households. The share of the unemployed was only 16 percentage points higher than that of all individuals.

The findings can be interpreted to give support to the perception of coincidence of unemployment and low-income. These results suggest that the unemployment in the United Kingdom is clearly a high risk for low income whereas it is not so in Denmark. The Greek result can reflect that there are also other reasons than unemployment which can lead to a low income situation.

Take-up rates - In order to analyse incentive impacts of the benefit system, it is important to know the take-up rates of benefits, *i.e.*, how many persons who fulfil the benefit eligibility actually take up the benefit. One is interested to know whether the reciprocity of benefits can be taken for granted or whether only a part of those fulfilling the primary eligibility condition in fact receive the benefits as well as whether there are large differences across countries.

Table 7 **Numbers and take-up rates of all benefits and Unemployment benefits.**

	A. All households			
	Recipients of all benefits		Unemployment benefits	
	Number in 1000	Take-up rate, % of all unemployed	Number in 1000	Take-up rate, % of all unemployed
Belgium	498	92	446	83
Denmark	337	98	273	80
France	2707	87	1218	39
Germany	2974	97	1846	60
Greece	267	43	70	11
Ireland	227	92	189	76
Italy	830	21	148	4
Luxembourg	5	78	1	8
The Netherlands	445	49	264	29
Portugal	300	69	110	25
Spain	1874	62	1028	34
United Kingdom	2183	88	502	20
EU 12	12647	68	6095	33

Table 7 cont.

	B. Low-income households			
	Recipients of all benefits		Unemployment benefits	
	Number in 1000	Take-up rate, % of all unemployed	Number in 1000	Take-up rate, % of all unemployed
Belgium	257	94	228	83
Denmark	125	98	109	85
France	1466	86	637	37
Germany	1735	96	1084	60
Greece	133	44	25	8
Ireland	138	91	120	80
Italy	437	19	80	3
Luxembourg	3	81	1	13
The Netherlands	212	49	128	29
Portugal	165	67	53	22
Spain	1093	62	596	34
United Kingdom	1691	90	379	20
EU 12	7454	68	3439	31

According to the household panel survey, the average take-up rate of unemployment benefits was 33 per cent amongst all unemployed and at about the same level amongst the unemployed in low-income households. Three countries had high take-up rates of unemployment benefits, namely Belgium (83 per cent for both all and low-income unemployed), Denmark (80 per cent for all and 85 per cent for low-income unemployed), and Ireland (76 and 80 per cent). After these countries, only in Germany did a relatively large number of unemployed receive unemployment benefits (60 per cent). In the rest of the countries the take-up rate did not exceed 40 percent. The figures of some countries, notably Greece, Italy, Luxembourg and the Netherlands shall, however, be interpreted with great caution because the numbers of unemployed were completely different from those in the Labour Force Surveys.

In summary, the figures indicate that the reciprocity of unemployment benefits in case of unemployment cannot be taken for granted in all countries. There seem to be strikingly large differences in the take-up rates of unemployment benefits across countries but there does not seem to be major differences in the take-up rates between the low-income and all unemployed within any country.

There may be several explanations for these figures, some of them probably proving that the take-up rates are low but it cannot be excluded, either, that some figures simply are too low because the survey has failed to gather proper information on all benefits or to define unemployment in a correct manner. Moreover, there are evident reasons why the take-up rates are below 100 per cent. In most countries, the unemployment benefit scheme is an insurance scheme requiring contributions from the beneficiary. In the absence of contributions, the person is not entitled to benefits. The second reason is that, in general, the insurance scheme requires at least some time of work history. If one becomes unemployed immediately after vocational or other

education, one would not be entitled to benefits. In some countries such persons are covered by basic unemployment assistance schemes, but in some other countries they have to apply for social assistance. Third, in most countries the benefit periods are limited. The unemployed stays without benefit when the period expires. Fourth, in some countries there are restrictions or means-testing to grant unemployment benefits to the second bread-winner or other family members than the principal bread-winner. Fifth, the countries can differ from each other in providing substituting schemes. For instance, Italy has several schemes (Mobility Benefit, Wage Supplementary schemes for laid-off people) which can work as substitutes for unemployment benefits and, hence, can partly be the cause of the low take-up of unemployment benefits (Martin 1996).

II.2.2.2. Net replacement rates

Net replacement rates have been calculated as the ratio of the average individual income of the unemployed (out-of-work income) to the average individual income of the employed (in-work income). Table 8 presents average results for the whole target population, Table 9 according to the educational level and Table 10 according to sex and age; in each case the rates are reported for both the groups of all households and low-income households.

Table 8 Net replacement rates (RR) of unemployed individuals.

	All households	Low-income households ¹⁾
Belgium	47	59
Denmark	74	87
France	49	53
Germany	55	72
Greece	46	56
Ireland	51	76
Italy	45	42
Luxembourg	38	49
Netherlands	49	53
Portugal	54	68
Spain	44	61
United Kingdom	56	70
EU 12 ²⁾	52	64

1) The net replacement rates have been calculated within the respective comparison group, *i.e.*, the out-of-work income of the unemployed in low-income households is compared with the in-work income of the employed in low-income households.

2) Weighted by the number of unemployed receiving benefits.

The average net replacement rate (weighted by the number of unemployed receiving benefits) was 52 per cent in the EU countries. In six countries the rates were somewhat below 50 per cent (44 to 49 per cent in Spain, Italy, Greece, Belgium,

France and the Netherlands), in four other countries somewhat above 50 per cent (51 in Ireland, 54 in Portugal, 55 in Germany and 56 per cent in the United Kingdom). Luxembourg had the lowest rate (38 per cent) and Denmark was far above the other countries (74 per cent).

The net replacement rate for the subset of unemployed belonging to low-income households was 64 per cent on average, 12 percentage points higher than that for all unemployed. High rates were found in Denmark (87 per cent), Ireland (76), Germany (72) and United Kingdom (70). The highest increases for low-income unemployed in comparison with the rate for all unemployed were noted in Ireland (by 25 percentage points), and in Germany and Spain (by 17 percentage points). Only in France and Italy were the net replacement rates at about the same level as those for all unemployed and Italy was the only country where the rate was clearly low (42 per cent).

In fact, in most European countries, the average out-of-work income for the unemployed in low-income households was in absolute terms almost the same as that on average for all unemployed. The unemployed in low-income households received only 10 per cent less than all unemployed, whereas the employed in low-income households received on average 25 per cent less than all employed.

Table 9 Net replacement rates according to level of education

	A. All households							
	All		Educational level					
	Unemployed in 1000	Average RR	Share of the unemployed ¹⁾			Net replacement rates ²⁾		
		Low	Medium	High	Low	Medium	High	
Belgium	540	47	59	24	11	49	49	51
Denmark	343	74	68	16	15	79	75	63
France	3113	49	70	14	12	57	43	36
Germany	3081	55	86	7	6	60	60	45
Greece	617	46	45	40	15	54	44	40
Ireland	248	51	76	18	5	58	51	31
Italy	3874	45	62	29	5	47	39	52
Luxembourg	7	38	87	3	11	41	n.a.	66
Netherlands	916	49	34	54	12	50	54	54
Portugal	438	54	91	7	1	65	41	33
Spain	3006	44	78	11	12	50	45	33
UK	2481	56	77	16	7	61	58	49
EU 12	18663	52	71	19	9	57	50	42

Table 9 cont.

	B. Low-income households							
	All		Educational level					
	Unemployed In 1000	Average RR	Share of the unemployed ¹⁾			Net replacement rates ²⁾		
		Low	Medium	High	Low	Medium	High	
Belgium	272	59	63	22	8	60	60	63
Denmark	123	87	71	13	16	89	85	75
France	1686	53	76	14	7	58	41	27
Germany	1790	72	89	6	4	74	58	66
Greece	286	56	56	34	10	64	38	49
Ireland	148	76	79	17	3	76	75	32
Italy	2283	42	65	27	3	44	39	19
Luxembourg	4	49	95	n.a.	5	50	n.a.	n.a.
Netherlands	426	53	41	51	7	56	54	51
Portugal	242	68	94	6	n.a.	70	78	n.a.
Spain	1701	61	83	8	9	61	69	55
UK	1865	70	81	14	4	76	50	73
EU 12	10828	64	76	17	6	67	51	53

1) The shares may not always add up to 100 because of missing information on education level.

2) The net replacement rates have been calculated for each group separately by comparing the average out-of-work income of each group of unemployed with the average in-work income of the respective group of employed.

In a comparison of the in- and out-of-work income, it is interesting to analyse the compensation systems according to the level of education. This qualification is dominant when considering hiring possibilities in the labour market and can be interpreted as a proxy for a skill level.¹⁰ On the other hand, social and tax policies often aim to ensure a minimum or fair income maintenance irrespective of the wage level, and thereby yielding a better replacement for low-paid employees with an undesired side-effect of lower work incentives for low-skilled people. When calculating these net replacement rates, the average income of the unemployed belonging to a given education category is divided by the average income of the employees belonging to the same education category.

In all countries except the Netherlands unemployment is concentrated amongst people with a low education level. On average, 71 per cent of the unemployed had a low education level, 19 per cent a medium and 9 per cent a high education. The share of low-educated unemployed was over 80 per cent in Germany, Luxembourg and Portugal and additionally amongst low-income households also in Spain and the United Kingdom. The Netherlands was a clear outlier of this pattern; a good 50 per cent of the unemployed had a medium education level and only a good third had the lowest education level. Greece was the other country with a low level education share less than 50 per cent of all unemployed. The pattern of unemployment according to

¹⁰ Low-level of education means that one has a primary education and possibly vocational training in the work environment but no institutional vocational education; medium-level education means an attainment of vocational education in school; high level of education means an attainment of college or university level education.

education level was very similar in the sub-population of low-income households, being only a little more concentrated in low education level.

In the majority of countries, there seems to be a pattern of higher replacement rates for lower-educated unemployed. However, in Luxembourg, Italy and Belgium, the highest net replacement rates were found in the group with the highest education, even though the difference was only minor. The same pattern of replacement rates, with a clearer difference in favour of low-educated unemployed, was also found in the sub-population of low-income households.

Table 10a Net replacement rates (RR) of unemployed individuals according to sex and age

	All households, males								
	Both sexes	All males		Share of unemployed males			Replacement rates ¹⁾		
	Average RR	% of all UE	RR	< 30	31 - 45	> 45	< 30	31 - 45	> 45
Belgium	47	40	46	37	26	37	50	50	45
Denmark	74	47	69	31	37	32	72	65	75
France	49	48	48	45	33	22	45	54	56
Germany	55	50	56	31	24	45	54	62	55
Greece	46	41	49	55	27	18	54	53	49
Ireland	51	77	47	42	38	19	57	49	40
Italy	45	53	45	61	19	20	43	43	62
Luxembourg	38	63	35	53	33	14	37	38	39
Netherlands	49	35	52	38	36	26	58	57	63
Portugal	54	43	58	42	27	31	62	55	58
Spain	44	54	49	49	30	21	59	49	47
UK	56	77	47	45	29	27	37	70	30
EU 12	52	53	51	46	27	27	48	58	49

	All households, females								
	Both sexes	All females		Share of unemployed females			Replacement rates ¹⁾		
	Average RR	% of all UE	RR	< 30	31 - 45	> 45	< 30	31 - 45	> 45
Belgium	47	60	52	38	39	23	52	61	40
Denmark	74	53	82	36	31	33	87	82	86
France	49	52	53	47	32	21	53	63	49
Germany	55	50	62	30	30	40	57	72	57
Greece	46	59	48	65	26	8	59	48	45
Ireland	51	23	48	84	12	4	53	57	37
Italy	45	47	46	66	22	13	55	42	49
Luxembourg	38	37	45	41	41	18	43	47	40
Netherlands	49	65	50	19	52	29	46	58	41
Portugal	54	57	52	38	34	27	57	50	51
Spain	44	46	40	61	31	8	46	41	36
UK	56	23	78	43	32	25	45	123	58
EU 12	52	47	55	48	31	21	53	65	53

1) See footnote 2 in table 9.

Table 10b Net replacement rates (RR) of unemployed individuals according to sex and age

Low-income households, males									
	Both sexes	All males		Share of unemployed males			Replacement rates ¹⁾		
	Average RR	% of all UE	RR	< 30	31 – 45	> 45	< 30	31 - 45	> 45
Belgium	59	46	57	36	28	36	52	61	56
	87	47	79	43	39	19	94	65	75
Denmark									
France	53	52	55	39	36	24	58	58	58
Germany	72	51	78	26	28	45	71	87	73
Greece	56	49	57	48	32	20	57	62	61
Ireland	76	85	70	34	45	21	80	71	53
Italy	42	55	43	62	21	16	41	39	56
Luxembourg	49	58	48	28	48	24	30	47	55
Netherlands	53	37	50	33	43	23	59	52	59
Portugal	68	50	68	42	30	28	65	71	70
Spain	61	58	68	48	32	20	78	70	73
UK	70	80	63	41	34	25	54	71	68
EU 12	64	58	64	44	31	25	61	69	67

Low-income households, females									
	Both sexes	All females		Share of unemployed females			Replacement rates ¹⁾		
	Average RR	% of all UE	RR	< 30	31 – 45	> 45	< 30	31 - 45	> 45
Belgium	59	54	71	38	41	21	61	78	73
Denmark	87	53	94	39	38	23	84	96	111
France	53	48	57	52	31	17	60	64	57
Germany	72	49	72	37	33	30	71	82	63
Greece	56	51	65	63	26	11	66	66	60
Ireland	76	15	67	90	8	2	58	106	86
Italy	42	45	47	67	22	11	68	31	51
Luxembourg	49	42	61	41	40	20	55	53	114
Netherlands	53	63	82	20	54	26	79	87	69
Portugal	68	50	71	39	40	22	52	80	97
Spain	61	42	57	62	29	9	64	55	52
UK	70	20	63	45	29	26	58	67	67
EU 12	64	42	64	51	31	18	64	71	64

1) See footnote 2 in table 9.

Unemployment was slightly dominated by males, with 53 per cent of all unemployed in 12 Member States. However, in seven countries out of twelve, the majority of the unemployed were women. Ireland and the United Kingdom were clear exceptions. In these countries only 23 per cent of the unemployed were women. In the majority of countries, the net replacement rates of women were higher than those of men but, nevertheless, in absolute terms the benefit level was lower in all countries. The higher replacement rates were mostly due to lower wage levels of women. Also, in the case of the United Kingdom, structural differences like a low share of female unemployed, who most likely received complementary means-tested benefits, contributed to the great difference in replacement rates between men and women.

In about half of the countries, unemployment was concentrated in the youngest age group: almost half of the unemployed were under 30 years old. In many of these countries, notably in Greece, Portugal and Spain the net replacement rates were also the highest in this age group. Only in Germany unemployment was concentrated in the oldest age group, both for men and women, but it was not accompanied with the highest net replacement rate. Instead, in five other countries, the net replacement rates were highest in the oldest age group for men but in no country for women. The conservative expectation of the highest net replacement rates in the middle-aged group (31-45) seemed to hold best for women, which was the case in seven countries, but for men only in three countries.

In the sub-population of low-income households, The pattern of unemployment by sex and age amongst the low-income households was very similar to that of all unemployed. However, unemployment was more dominated by males; they formed a majority in nine countries.

II.2.2.3. Distribution of out-of-work income relative to average in-work income

The results presented above implicate some variation in results according to various characteristics. In the following, the total variation according to the benefit level relative to the average in-work income is analysed.¹¹ Then the population of unemployed is distributed in 4 groups according to the level of their net replacement rates (those unemployed receiving more than 100 per cent of the average in-work income, between 70 and 100 per cent, between 50 and 70 per cent and less than 50 per cent).

On average, two unemployed out of three received some benefits in the EU countries. This pattern was the same amongst all unemployed and those in low-income households. The take-up rate of benefits was over 90 per cent in four countries, namely in Belgium, Denmark, Germany and Ireland. The lowest ratios were found in Italy (21 per cent), Greece (43 per cent) and the Netherlands (49 per cent). These results might be affected the discrepancies found in the unemployment figures between the ECHP and Labour Force Surveys. It seemed evident that the ECHP unemployment figures, which were far above those of Labour Force Survey in these countries, also include non-employed people, *i.e.*, people who are not actively seeking for job and thereby not entitled to unemployment benefits. In the ECHP, they, however, are reported as unemployed, and therefore, the take-up of benefits becomes underrated.

¹¹ In this case, the out-of-work income of each unemployed (not the average out-of-work income of all unemployed) is divided by the average in-work income of all employees when all households are considered, and respectively, by the average in-work income of employees in low-income households when the sub-population of low-income households is considered.

Table 11 **Distribution of out-of-work income of unemployed individuals relative to the average in-work income**

	A. All households					
	The unemployed		Share of unemployed with benefits			
	Receiving benefits		Replacement rate			
	in 1000	% of all UE	> 100	70 - 100	50 – 70	< 50
Belgium	498	92	5	11	25	58
Denmark	337	98	13	35	37	16
France	2707	87	9	11	18	62
Germany	2974	97	12	13	18	57
Greece	267	43	8	15	20	57
Ireland	227	92	5	17	21	57
Italy	830	21	10	11	15	64
Luxembourg	5	78	3	5	13	78
Netherlands	445	49	6	14	20	59
Portugal	300	69	9	11	27	53
Spain	1874	62	5	13	16	65
United Kingdom	2183	88	11	10	19	60
EU 12	12647	68	9	13	19	59

	B. Low-income households					
	The unemployed		Share of unemployed with benefits			
	receiving benefits		Replacement rate			
	in 1000	% of all UE	> 100	70 - 100	50 – 70	< 50
Belgium	257	94	10	23	25	42
Denmark	125	98	27	46	20	7
France	1466	86	10	17	16	57
Germany	1735	96	22	18	18	42
Greece	133	44	12	19	14	55
Ireland	138	91	23	28	10	39
Italy	437	19	10	10	12	68
Luxembourg	3	81	2	21	14	63
Netherlands	212	49	6	19	26	49
Portugal	165	67	16	29	20	35
Spain	1093	62	17	17	15	51
United Kingdom	1691	90	18	21	16	45
EU 12	7454	68	16	19	17	48

Around 60 per cent of the unemployed who received benefits had an out-of-work income less than half of the average in-work income. The only exception was Denmark where only one out of five or six unemployed had an income less than half of the average in-work income and almost half of the unemployed had an income level over 70 per cent of the average in-work income. High out-of-work income levels – interpreted here as those with more than 70 per cent of the average in-work income – were received by a good 20 per cent of unemployed who received benefits, which meant 2.5-3 million unemployed in 12 EU Member States.

Around one third of the unemployed in low-income households, which means 2.5 million people, had an out-of-work income more than 70 per cent of the average in-work income in low-income households. In Denmark three unemployed out of four had this income level and in Ireland half of the unemployed. 16 percent of the unemployed had a higher out-of-work income than the average in-work income.

The numbers of high out-of-work income relative to the average in-work income shall, however, not be interpreted to present the extension of work incentive problems. In the above table the income of the unemployed is compared with the average income of those in work, and not with the likely income which the unemployed could have if they took a job. Basically, the incentive problem is connected with the actual or likely wage level of each unemployed, and thus incentive problems may also appear amongst those who had a relatively low income level in comparison with the average in-work income level.

II.2.2.4. Summary of the results

The main conclusions of this study are the following:

- The number of unemployed was considerably higher than according to Labour Force Surveys: on average by 15 per cent in 12 Member States, but almost double in Greece, Italy, the Netherlands and Portugal. This calls for great caution in drawing conclusions on the living conditions of the unemployed.
- A third (32 per cent) of individuals belonged to low-income households, *i.e.*, the disposable income was less than two thirds of the average disposable income, ranging from 22 per cent in Denmark to 40 per cent in Portugal. The share of the unemployed in low-income households was 59 per cent, almost twofold the share of all individuals, ranging from 37 per cent in Denmark to 76 per cent in the United Kingdom. This finding can be interpreted to give support to the perception of coincidence of unemployment and low-income.
- Unemployment was concentrated amongst the low-educated, and thereby also amongst the low-skilled: about three out of four unemployed had a low education level. Almost half of the unemployed were young, under 30 years old.
- The take-up rate of benefits of all sorts (unemployment, housing, family allowances, social assistance etc.) amongst the unemployed was 68 per cent on average, twice as high as that of unemployment benefits alone. The take-up rate of all benefits was over 90 per cent in Belgium, Denmark, Germany and Ireland, and for low-income households also in the United Kingdom. The lowest rates were found in Italy (21 per cent), Greece (43 per cent) and the Netherlands (49 per cent). In fact, these were lowest in the countries where the greatest discrepancies in unemployment figures between the ECHP and Labour Force Surveys were found.

- Take-up rates of unemployment benefits amongst the unemployed were remarkably different between countries and notably low in many countries. However, the too high unemployment figures in some countries may lead to erroneous conclusions on take-up rates.
- The net replacement rate was on average 52 per cent and amongst low-income households 64 per cent. High average net replacement rate for all unemployed was found only in Denmark (74 per cent) and for the unemployed amongst low-income households in Denmark (87 per cent), Ireland (76 per cent), Germany (72 per cent) and the United Kingdom (70 per cent). The highest increases in replacement rates for low-income households in comparison with those for all households were found in Ireland (25 percentage points), and in Germany and Spain (17 percentage points).
- In the majority of countries net replacement rates were higher for low-educated people than for those with medium or high level education. The results support the pattern of higher net replacement rates for those with a lower wage and a lower education level. The conservative expectation of the highest net replacement rates in the middle-age group (31-45) seemed to hold best for women, which was the case in seven countries, but for men only in three countries.
- Around 60 % of the unemployed who received benefits had an out-of-work income which was less than half of the average in-work income. A good 20 % of the unemployed, about 2.5-3 million people, received an out-of-work income which was over 70 per cent of the average in-work income. Among low-income households, one third of the unemployed had an out-of-work income more than 70 per cent of the average in-work income in low-income households and 16 per cent of the unemployed had a higher income than the average in-work income.

II.3 Another approach to ECHP data

A study assigned by the Directorate-General for Employment, Industrial Relations and Social Affairs (later referred to as DG V study), also based on the ECHP data from 1993, compares the net income of the same persons who experienced both an unemployment spell and an employment period during the same observation year.¹² The income data relate to the average monthly net earnings from employment and the average monthly net income when drawing benefits during unemployment. As regards the benefits, those related to unemployment, whether as insurance-based benefits or as assistance, were covered. However, the family-related benefits including housing benefits were excluded. The population of this study was confined to those who had experienced at least a three months' unemployment spell and at least one month's full-time employment. The data did not allow the separation of those who had the

¹² European Commission (1998), "Social Protection in Europe 1997"

unemployment period after employment from those who were unemployed before employment, both groups are included. For the latter group, the replacement rate is calculated from the accepted post-unemployment wage level, which can be described as ex post replacement rate.

Similarly, as the study described in Chapter II.2.2 (later referred to as DG II study), the DG V study relates to individuals, but in contrast with the DG II study, compares the monthly income of the same individuals in different labour market situations, whereas the DG II study compares the yearly income of different persons in different labour market situations. The second major difference is that the DG V study excludes family-related benefits and can be interpreted to compare net unemployment benefit with net earnings. When these two approaches are compared with the modelled net replacement calculations of stylised households, both differ from the model approach in that they primarily attempt to measure individual net income, whereas the model calculations attempt to catch the impact of unemployment on family income.

The definitions of different target groups and different income concepts warrant the expectation of differences in results as well. The DG V comparison (confined to individuals having been both unemployed and employed) gives a more restricted look at the problem; as regards the income concept, it disregards the impact of family-related benefits, and as regards the target groups, it is confined to those who move from employment to unemployment or vice versa. Hence, one could expect that the take-up rate of unemployment benefits should be higher in the target group of the DG V study than among all unemployed (DG II study). The exclusion of family-related benefits gives cause to expect lower net replacement rates, however, different target groups may offset, at least partly; this impact.

The number of unemployed people in 10 EU countries (Luxembourg and the Netherlands as well as the new Member States Austria, Finland and Sweden excluded) examined in the DG V study was 4.1 million of which 2.8 million received unemployment benefits. These unemployed represented 22 per cent of those examined in the DG II study.

Table 12 Net replacement rates and take-up rates of Unemployment benefits in DG V and DG II studies

	Net replacement rate		Take-up rate of unemployment benefits		Take-up rate of all benefits
	DG V	DG II, all households	DG V	DG II	DG II
Belgium	48	47	91	83	92
Denmark	70	74	98	80	98
France	66	49	67	39	87
Germany	55	55	89	60	97
Greece	26	46	28	11	43
Ireland	55	51	84	76	92
Italy	49	45	26	4	21
Luxembourg	..	38	..	8	78
Netherlands	..	49	..	29	49
Portugal	75	54	28	25	69
Spain	55	44	53	34	62
United Kingdom	20	56	89	20	88
EU 12	49	52	67	33	68

The figures in table 12 compared with the figures of the DG II study show remarkable differences in results. The take-up rates of unemployment benefits were much higher (67 per cent) in the DG V study than in the DG II study (33 per cent) in all countries. Yet, the average take-up rate remained relatively low. This was affected by very low take-up rates, less than one third, in Greece, Italy and Portugal, whereas they were over 80 per cent in five countries (Belgium, Denmark, Germany, Ireland and United Kingdom). The most striking difference between the two studies was apparent in the United Kingdom where the DG V study showed the take-up rate of 89 per cent whilst the DG II study showed 20 per cent. Italy, Greece and Portugal showed the lowest take-up rates in both analyses.

Average unemployment compensation relative to earnings according to the DG V study is a little lower than according to the DG II study. This is unexpected because the DG II study covers all unemployed, whereas the DG V study only those who were both unemployed and employed during the reference year, and thus the majority of these unemployed likely received benefits which were not yet phased out due to a lengthy unemployment spell. The result can be explained by a narrower disposable income concept, which in the DG V study included only net unemployment benefits and excluded family-related benefits. The expectation of higher replacement rates holds only in three countries, namely in France, Portugal and Spain. In these countries the inclusion of all unemployed (in the DG II study) may lead to a marked decrease of net replacement rates, because in these countries the benefit level is gradually phased out over the unemployment spell. For about a half of the countries, the compensation

rates¹³ were at about the same level as net replacement rates for all unemployed in the DG II study.

Moreover, the compensation rates in Greece and the United Kingdom were far below the average net replacement rates of the DG II study. The mismatch in results is most prominent in the United Kingdom where, according to the DG V results, the take-up rate was very high but the compensation rate very low, whereas the DG II study showed rather opposite results. It is likely that the exclusion of family-related benefits contributes a lot to a low compensation rate in the DG V study. According to an OECD study (OECD 1997), for instance, in a British family of a one earner couple with two children, the income during unemployment consists of unemployment benefits only for one half and of housing and family allowances for the other half.

II.4 Swedish case study

The Swedish Ministry of Finance conducted quite recently a study on work incentives in the Swedish tax-benefit system.¹⁴ This offers an interesting enlargement to the above described empirical analysis for two main reasons. Sweden was not included in the ECHP survey but is a country with a Nordic type social protection system, of which only Denmark was included in the ECHP survey. The study was based on empirical data. In this respect the study had very similar aims as the studies based on the ECHP data but made a number of additional controls of the impact of various variables and applied several methods in order to compute individual net replacement rates. The most interesting one of these was the application of a microsimulation model.

The study was based on the Swedish Income Distribution Survey data from 1994, which is a national equivalent for ECHP data. It was not confined to only a simple comparison of disposable income of unemployed and employed households which corresponded the DG II approach. Due attention was paid to the complexity of this kind of comparison. One can always find shortcomings in different approaches and all factors affecting income formation cannot be controlled in the way that the “pure” effects of unemployment on income could be caught. One of the shortcomings of a statistical comparison is that the groups of unemployed and employed can differ from each other systematically in many respects. For example, it was recognised that the unemployed in Sweden were seven years younger on average than the employed.¹⁵ As

¹³ The concept of compensation rate is used in the original source similarly as net replacement rate in this study. Due to different content of the concepts, it is justified to make a conceptual distinction between them as well.

¹⁴ Ministry of Finance (1997), “Lönar sig arbete?”, Ds 1997:73 ESO, Sweden

¹⁵ As the wages tend to increase when work experience accrues, the simple comparison of the income of the unemployed with that of the employed underestimates the net replacement rate. An experiment considering merely the adjustment of age profiles resulted that the non-adjustment of age profiles for single person households underestimates the net replacement rate by 6-7 percentage points.

with age, other characteristics like sex, education, region, immigration, etc. can also cause composition differences between the groups compared. Finally, according to the study, original large differences in disposable income between the unemployed and employed could mostly be explained by composition differences.

In addition, a microsimulation model was used in order to calculate experimentally individual net replacement rates both for the employed and the unemployed represented in the sample data. This was done based on the assumption that the labour market status was changed. In the first simulation, all unemployed were given their former wage, or in some cases, an estimated wage, and then all taxes, housing benefits and child care fees were recalculated. In the second simulation, all employed were assumed to become unemployed and to receive an unemployment benefit determined by their wage, and then taxes and benefits also determined by new gross income were recalculated.

Table 13 Swedish net replacement rates for some household types by various approaches

	Empirical data	Simulation experiments	
	Disposable income of the unemployed relative to that of the employed	Net replacement rate when unemployment is simulated	Net replacement rate when employment is simulated
Single person	71	66	77
Single parent with children	93	81	92
Couple without children	85	79	88
Couple with one child	86	80	91
Couple with two children	89	82	92
Couple with 3+ children	95	82	93

The most prominent result of table 13 is that different approaches gave very similar results. The results of statistical comparison did not differ considerably from those gained by simulation experiments. This was partly a result of the adjustment of composition differences, which, in fact, raised the empirical net replacement rates. The experiment allows one to argue that when one excludes the composition differences, and thus, comes closer to measure the ‘pure’ impact of unemployment, also the results of different approaches converge.

The empirical net replacement rates were especially very close to the net replacement rates simulated for the unemployed. The fact that the simulated replacement rates for the employed were notably lower, about 10 percentage points, than those simulated for the unemployed, is explained as being derived from selection effects: the employed represented older persons with higher wages and a lower unemployment risk.

When the Swedish results are compared with those of the ECHP survey, it is striking that Swedish net replacement rates are so much higher, 85 per cent on average for the unemployed, than in the countries included in the ECHP where the highest rates were

74 per cent for Denmark and 56 per cent for the United Kingdom. One has to note that a partial explanation for the higher Swedish rates is the exclusion of composition differences. However, also according to the net replacement calculations for stylised households, Sweden has the highest rates and the differences observed between Sweden and Denmark are in line with those found in stylised net replacement studies.¹⁶

Moreover, the conclusions of the Swedish study stress the combination effects of taxes, benefits, social assistance and childcare fees, because these are integral parts of the social protection for the unemployed and other groups on social benefits. As such, social security systems are designed to be reasonable but the interaction between tax and benefit systems gives cause for system problems, specifically for certain groups of people. Furthermore, the study provides evidence that there were notable numbers of people who worked but who would have received almost the same amount if they were unemployed as well as there were unemployed who could have increased their income only marginally if they began to work. Still, for most wage earners in Sweden, it paid to work.

II.5 Comparison between empirical and stylised net replacement rates

When comparing empirical and stylised net replacement rates, two completely different methodologies are applied and compared. Therefore, it is not easy to find proper summary measures for comparison purposes. Especially, the large variations in family and duration compositions of unemployment, which is captured in summary empirical measures, is difficult to display by stylised measures, which, by definition, try to simplify complex situations. Additionally, stylised calculations were made at household level whereas the empirical studies based on ECHP data played primarily at individual level.

In the following, a tentative comparison between the approaches of DG II and DG V is made with the OECD calculations. Among the OECD calculations, there are two benchmarks: the net replacement rate of the first month of unemployment and that of the 60th month. While the DG II approach covers all unemployed, neither the first month's nor the 60th month's rate perfectly correspond to the "average" duration of unemployment in real data. The approach of DG V is closer to the first month of unemployment, because the study was confined to those having been both unemployed and employed during the reference year.

¹⁶ See, for instance, OECD and Seven Country Group studies.

Table 14 Comparison of empirical and stylised net replacement rates

EU countries	Stylised studies		Empirical studies	
	OECD 1995 APW wage level		ECHP data 1993	
	1st month of unemployment	60th month of unemployment	DG II study	DG V study
Austria	63	61	..	..
Belgium	61	58	47	48
Denmark	70	74	74	70
Finland	75	81	..	..
France	76	46	49	66
Germany	72	66	55	55
Greece	..	..	46	26
Ireland	49	49	51	55
Italy	42	5	45	49
Luxembourg	87	66	38	..
Netherlands	79	71	49	..
Portugal	78	2	54	75
Spain	74	35	44	55
Sweden	78	82	..	..
United Kingdom	61	64	56	20

The above comparison shows that there is a fair match between the empirical and stylised net replacement rates in half of the countries. The Danish and the Irish results are identical, and there is a good match in Italy as well. In a number of countries, namely in France, Portugal and Spain, the empirical results can be interpreted to be consistent with stylised calculations when the phasing-out of the benefit level over the unemployment spell is taken into account: empirical results show lower replacement rates than the stylised calculations for the first month's replacement but higher than for the sixtieth month's replacement. However, in the other half of the countries, the empirical net replacement rates are significantly lower than the stylised ones. In particular, the results for the Netherlands and Luxembourg are inconsistent: the ECHP survey shows very low replacement rates, whereas the stylised calculations show high ones. Also in Belgium, Germany and the United Kingdom the empirical results show somewhat lower replacement rates.

There is less variation in empirical average rates between countries; they tend to concentrate around the rate of 50 per cent, with the exceptions of Luxembourg (38 per cent) and Denmark (74 per cent). Instead, the stylised net replacement rates are spread over a wider range of 61-87 per cent in the first month of unemployment (except in Italy (42 per cent) and Ireland (49 per cent)) and over the range of 46-82 per cent in the sixtieth month (except in Portugal (2 per cent), Italy (5 per cent) and Spain (35 per cent)).

One has to pay due attention to that the empirical figures were calculated for those receiving benefits. In many countries the take-up rates of benefits were notably low. One obvious reason for this is that the empirical data tend to show the unemployed in a broader sense also possibly including non-employed persons. In addition, the differences may also arise from the availability of benefits, which are affected, apart from the pure eligibility rules, also by other reasons, *e.g.*, the administration of

benefits. All in all, one can conclude that there are notable differences between empirical and stylised results.

Nevertheless, the empirical results do not warrant saying that the net replacement rates for stylised households were unrealistic. Moreover, the Swedish case study shows very consistent results of empirical and simulated approaches. It is not possible to say whether the Swedish results match better due to essential differences in tax-benefit systems like the take-up rates of benefits in Sweden, on the one hand, and in the countries covered in the ECHP, on the other. However, these results call for further efforts to study the factors which possibly cause differences in results. First, a better control of other factors than the labour market status when the groups of unemployed and employed are compared should be taken. The Swedish study gives implications that a large part of income differences are due to composition differences in comparison groups. Second, the take-up rate of benefits needs to be examined more carefully. Strikingly low take-up rates in many countries demand better explanations as to whether it is really so and why.

There is evidence on notable dispersion of out-of-work income relative to average in-work income. However, this cannot be interpreted as distribution of net replacement rates because out-of-work income is not compared with the likely or actual in-work income of the same individuals, and thus it does not reveal the extent of possible incentive problems. Only a microsimulation model based on empirical data offers a possibility to examine the distribution of net replacement rates.

III CONCLUSIONS AND FURTHER RESEARCH

A first comparison of empirical results with the stylised calculations gives a result that replacement rates may actually in many countries be lower than those calculated for stylised households. Empirical results also suggest that the take-up rates of unemployment benefits amongst the unemployed are notably low in many countries and that there are marked differences between countries. However, the take-up rates of benefits of all sorts are considerably higher. The take-up figures should be interpreted only with great caution, because there are obvious discrepancies in the concept of unemployment between the ECHP and Labour Force Survey. In some countries, the differences are moderate and can reflect differences which are also found between the national administrative sources and the Labour Force Survey. In some other countries, however, (Greece, Italy, Luxembourg, Netherlands and Portugal), the unemployment figures are far too high, and thus risk erroneous conclusions on living conditions of the unemployed or on the calculation of take-up rates.

A great number of variables affecting the comparison could not be controlled in the above studies based on ECHP data. The strength of actual data in capturing the variation of family and unemployment situations is also a limitation in a comparison with stylised calculations. There are notable difficulties in correctly defining the groups of households which can properly be compared with each other on the basis of empirical data. Further empirical work needs to take better control of individual and household characteristics affecting the composition of the groups to be compared.

The scope of the work incentive problem cannot be confined solely to unemployment benefit systems. Tax-benefit systems have a wide interaction, not only between each of the benefit systems and the taxation but also between various benefit systems. There may be differences between countries as to which extent they offer substituting benefits to the unemployed such as special allowances to laid-off people, training allowances or social assistance. Moreover, some other benefits like disability or early retirement benefits may substitute unemployment benefits but, when doing so, they change the labour market state of the individual. For instance, OECD (1996a) and Eight Countries Group (1997) point out that these types of non-employment benefit may sometimes be used as substitutes for unemployment benefits and those receiving these benefits but defined as non-employed can be affected by work incentives as well. Hence, both the scope of benefits and the target population should be reconsidered.

The household level approach should be preferred also in empirical calculations. It is evident that taxes and family-related benefits are an integral part of the social protection system which influences the disposable income of the family of the unemployed and thereby also the work incentives of unemployed family members.

Behavioural responses were not the subject of this study. The net replacement rates alone do not allow conclusions to be drawn on the probability of the labour market

transitions. However, the relationship between wage and benefit levels is one factor which affects the functioning of the labour market. Studies have found modest positive relationships between the level of benefit and the duration of unemployment but a clearer relationship between the duration of benefit and duration of unemployment. Moreover, this relationship can also influence wage bargaining and wage formation.¹⁷ Hence, measurement of incentives stays a meaningful task for economic research.

The above-mentioned studies have promoted methodological discussion on measurement of net replacement rates. The calculations of the OECD, the Seven Countries Group and the Central Planning Bureau have contributed to finding a more established basis for calculations and created a framework for cross-country comparisons. Even though there are small differences in assumptions, the results are robust. The approach of stylised net replacement calculations is useful when interpreted as how the systems have been designed to work and how the interaction of tax-benefit systems affects the final outcome.

International comparisons of the incidence and distribution of high net replacement rates have suffered from the lack of appropriate data. The ECHP improves the situation in this. An important aspect of the ECHP data is that, in future, it will allow the same individuals to be followed over time and thus will provide information on the transitions in and out of employment as well as on the income received in different situations. The advantages of the panel structure of the sample have not yet been exploited but invite analysing of labour market transitions and their underlying factors.

Statistical comparisons do not provide a comprehensive method for analysing work incentives in tax and benefit systems. The simulation technique applied in the calculations of net replacement rates for stylised households can be applied together with empirical data as well. Many countries already regularly apply microsimulation analysis in tax and benefit reform designing. Such models enable account to be taken of all interactions of taxes and benefits as well as enabling experiments to be made by changing the labour market status of persons. Thus, for each individual and household in the sample, the impact on net income can be simulated when a transition from employment into unemployment or vice versa is assumed. When the model is based on micro-data, it results, in this example, in new information of the actual level and distribution of net replacement rates for actual unemployed people.¹⁸

More research on behavioural responses to policy changes would seem to be required. In order to say more on the actual influence of benefits on labour market transitions,

¹⁷ See the annex: Message from literature.

¹⁸ Apart from the models already built for single countries, a multi-country project is being settled, which is aimed at constructing an integrated benefit-tax model (called EUROMOD) for all EU countries, building on existing households survey data and focused on social and integration policies (see Sutherland, 1996 and 1997). Dynamic models including behavioural responses have been built, for instance, in Australia (DYNAMOD; see NATSEM: Technical Paper series) and Canada (DYNACAN; see Chenard, 1995) and USA (CORSIM; see Caldwell et al., 1996).

the probabilities of the labour market transitions should be known. The longitudinal data are crucial for examining labour supply parameters. When these are known, behavioural modules can be incorporated further into microsimulation models, and thereby make them more advanced in allowing, for instance, examination of labour market responses of individuals to policy changes. These kinds of model would be powerful tools in providing actual data on households and their work patterns in combination with simulation models for tax-benefit rules and behavioural responses.

References

Ahn N and Ugidoz-Olazabal A (1995), "Duration of Unemployment in Spain: Relative Effects of Unemployment Benefit and Family Characteristics", Oxford Bulletin of Economics and Statistics, Vol. 57, No. 2, pp. 241-264

Arellano M, Bentolilla S and Bover O (1996), "Unemployment Duration, Benefit Duration and the Business Cycle", mimeo.

Atkinson A B and Micklewright J (1991), "Unemployment Compensation and Labour Market Transitions: A Critical Review", in Journal of Economic Literature, Vol. XXIX, No. 4, pp. 1679-1727.

Atkinson A B and Morgensen G V (1993), "Welfare and work incentives: a North European perspective", Clarendon Press, Oxford.

Ben-Horim M and Zuckerman D (1987), "The Effect of Unemployment Insurance on Unemployment Duration", Journal of Labor Economics, Vol. 5, No. 3, pp. 386-390.

Blank R M and Freeman R B (1993), "Evaluating the connection between social protection and economic flexibility", National Bureau of Economic Research, Cambridge, NBER Working Papers Series, No, 4338.

Blundell R W (1997), "The Impact of Taxation on Labour Force Participation and Labour Supply", OECD Jobs Study, Working Paper Series No. 8, OECD, Paris

Blöndal S and Pearson M (1995), "Unemployment and other non-employment benefits", Oxford Review of Economic Policy, Vol. II, No. 1, pp. 136-169.

Buti M, Franco D and Pensch L R (1997), "Reconciling the Welfare State with Sound Public Finances and High Employment", in the Volume "The Welfare State in Europe: Challenges and Reforms", European Economy, Reports and Studies No. 4, 1997, European Commission

Caldwell et al. (1996), "CORSIM 3.0 User and Technical Documentation", Department of sociology, Cornell University

Capen M M, Cohn E and Ellson R (1985), "Labour supply effects of unemployment insurance benefits", Applied Economics, No. 17, pp. 73-85.

Central Planning Bureau (1995), "Replacement rates - A transatlantic view", CPB Working Paper, No. 80, September.

Chénard D (1995), "DYNACAN. Dynamic Microsimulation Model for Canada. Equations manual", Office of the Superintendent of Financial Institutions, Ottawa

Dilnot A W and Morris C N (1983), "Private costs and benefits of unemployment: measuring replacement rates", Oxford Economic Papers, Supplement, November, pp. 321-340.

Eight Countries Group (1997), "Income Benefits for Early Exit from the Labour Market in eight European Countries", Werkdocumenten No. 61, Ministerie van Sociale Zaken en Werkgelegenheid, The Netherlands; (and European Economy, Reports and Studies No. 3, 1998, European Commission; forthcoming)

Elmeskov J, Martin J P and Scarpetta S (1998), "Key Lessons for Labour Market Reforms: Evidence from OECD Countries' Experiences", mimeo

European Commission (1996a), Social Protection in Europe 1995, Brussels

European Commission (1996b), "The European Community Household Panel (ECHP): Survey Methodology and Implementation, Volume 1", EUROSTAT, Luxembourg

European Commission (1996c), "ECHP Wave 1 documentation," Doc. Pan 15.2.1996, EUROSTAT, Luxembourg

European Commission (1998), Social Protection in Europe 1997, Brussels

Finansministeriet (1997), "Lönar sig arbete?", Ds 1997:73 ESO, Sweden

Friedman M (1977), Nobel Lecture: "Inflation and Unemployment" in Journal of Political Economics, Vol. 85, No. 3, pp. 451-472.

Haveman R (1995), "Reducing Poverty while Increasing Employment: A Primer on Alternative Strategies, and a Blueprint", in OECD Economic Studies No. 26, OECD, Paris

Haveman R (1997), "Employment and Social Protection: Are They Compatible?", in OECD Social Policy Studies No. 21, OECD, Paris

Katz L F and Meyer B D (1990), "The impact of potential duration of unemployment benefits on the duration of unemployment", Journal of Public Economics, North-Holland, Vol. 41, pp 45-72.

Layard R, Nickell S and Jackman R (1991), Unemployment - Macroeconomic performance and the labour market, Oxford University Press.

Lindbeck A (1997), "Welfare State Dynamics", in the Volume "The Welfare State in Europe: Challenges and Reforms", European Economy, Reports and Studies No. 4, 1997, European Commission

Martin J P (1996), "Measures of replacement rates for the purpose of international comparisons: a note", OECD Economic Studies, No. 26, January, pp. 99-114.

Ministry of Finance (1995), “Unemployment Traps and Poverty Traps – What Matters for the Trade-off?”, Working Papers No. 5, Ministry of Finance, Denmark

Moffitt R (1992), “Incentive Effects of the US Welfare System: A review”, Journal of Economic Literature, 30/01, pp. 1-61

Narendranathan W, Nickell S and Stern J (1985), "Unemployment benefits revisited", in The Economic Journal, Vol. 95, No. 378, pp. 307-329.

NATSEM (1993-97), DYNAMOD Technical Paper series, Canberra, Australia

OECD (1994), “The OECD Jobs Study: Facts, Analysis, Strategies”, OECD, Paris

OECD (1995), “The Tax/Benefit Position of Production Workers, 1995 Edition”, OECD, Paris.

OECD (1996), Employment Outlook 1996, OECD, Paris.

OECD (1997a), “The OECD Jobs Strategy: Making Work Pay. A Thematic Review of Taxes, Benefits, Employment and Unemployment”, OECD, Paris

OECD (1997b), “Benefits and Incentives in OECD Countries, 1995”, Working Party on Social Policy, OECD, Paris

OECD (1998), Employment Outlook 1998, OECD, Paris

Seven Countries Group (1996), “Unemployment Benefits and Social Assistance in seven European Countries, Werkdocumenten No. 10, Ministerie van Sociale Zaken en Werkgelegenheid, The Netherlands

Sutherland H (1996), “EUROMOD - A European benefit-tax model”, Department of Applied Econometrics, University of Cambridge, The Microsimulation Unit, Research Note, No. MU/RN/20, September.

Sutherland H (1997a), “Policy Simulation at the European level: a guide to EUROMOD”, Department of Applied Econometrics, University of Cambridge, The Microsimulation Unit, Research Note, No. 24, April.

Sutherland H ed. (1997b), “EUROMOD – A European Benefit-Tax Model and Social Integration”, Preparatory Study Final Report, Department of Applied Econometrics, University of Cambridge

Annex A MESSAGE FROM THE LITERATURE

Since the late 1970s, much literature has been dedicated to the analysis of the impact of unemployment benefits on unemployment. In particular, this has been achieved through a lot of empirical research. Most of the studies analysed the correlation existing between unemployment benefits (in both level and duration) and observed unemployment spells. Some have studied the impact of benefits on the probability to exit from unemployment.

Narendranathan et al. (1985) carried out in 1982 the first relevant study to analyse the impact of unemployment benefits on unemployment on the basis of a longitudinal data set which contained precise information on actual benefit receipts in the United Kingdom.¹⁹ The object of their investigation was to establish the determinants of the duration of the unemployment spell experienced by the sample after their entry into registered unemployment in the autumn of 1978. They calculated the probability of leaving unemployment as the product of the probability of receiving a job offer and the probability that such an offer would be accepted.

The main conclusions of their study were:

- The elasticity of expected registered unemployment duration for men with respect to unemployment benefits was 0.28-0.36. This result is very well defined and highly robust.
- The effect of unemployment benefits varies with age. The elasticity expected duration with respect to benefits is 0.65 for teenage men, 0.47 for men of 20-24 years, 0.26 for men of 25-44 years and 0.08 for men over 45 years.
- Benefits have no impact on the conditional probability of leaving unemployment for the long-term unemployed (over six months) except in the case of teenagers.
- The conditional probability of leaving unemployment shows no sign of decreasing with duration. This provides strong evidence that reservation wages fall with duration.
- There is very little evidence to support the view that benefits effects are greater for those whose benefit replacement ratio is already high.

Capen et al. (1985) used data from the 1976 wave of the Panel Study of Income Dynamics to study the effect of unemployment insurance benefits on weeks worked in the US and they found empirical support for a negative relationship between the two variables. *Ceteris paribus*, individuals who received benefits during their period of unemployment worked 2.1 weeks less, on average, than non-covered workers. If the average full-time worker is employed for 50 weeks per year, then unemployment insurance appears to reduce employment by 4.2 per cent for workers receiving

¹⁹ This is the DHSS Cohort Study of the Unemployed, which is a sample of the inflow into registered unemployment of 2,300 men taken in the autumn of 1978.

unemployment insurance benefits. Moreover, the examination of the coefficients of the wage rate and non-wage income variables showed that the relationship between weeks worked and non-wage income is negative, while that between weeks worked and wage rate is positive (non-wage income elasticity and wage elasticity are calculated to be respectively -0.08 and 0.05 per cent). Interesting findings were found when comparing recipients and non-recipients of unemployment insurance: the income elasticity of a beneficiary's weeks worked is more negative than that of non-recipients, which means that recipients of insurance benefits respond more negatively in terms of weeks worked than do non-recipients of these benefits.²⁰

Katz and Meyer (1990) examined the impact of the potential duration of unemployment insurance benefits on unemployment in the US. By using a large sample of households heads, they found that sharp increases in the escape rate from unemployment both through recalls and new job acceptances were apparent for unemployment insurance recipients around the time of benefits exhaustion, while such increases were not apparent at similar points of spell duration for non-recipients. Moreover, through their analysis of accurate administrative data from 12 states, they found that a one week increase in potential benefit duration increases the average duration of the unemployment spells of insurance benefit recipients by 0.16 to 0.20 weeks.

In order to measure the correlation between benefits and aggregate unemployment rates, **OECD (1994)** modelled unemployment rates as a lagged function of benefits entitlements in cycle-average data. The lagged measure of benefit entitlements is defined as the average of the current summary measure of entitlements (i.e. the average of nine *ex ante* replacement rates calculated for three duration periods in unemployment crossed by three family situations) two, four and six years previously. As a result, replacement rates and duration of benefits affect unemployment rates with an elasticity of 1 or slightly more.

Using hazard models based on survey data to analyse unemployment duration in Spain, **Ahn and Ugidos-Olazabal (1995)** found that unemployment benefit has a large negative effect on the probability of leaving unemployment. However, they stress that this effect is mostly due to the reduced exits from the labour force, while the disincentive effect on unemployment is much less significant. In fact, they calculated that, while the transitions from unemployment into employment are reduced by 25 per cent for individuals receiving unemployed benefits, the exit rate from the labour force is reduced by 50 per cent during eligible periods than ineligible periods. This suggests that “many jobless people who decide to leave the labour force delay their actions until they exhaust their unemployment benefits” (p. 258).

Arellano et al. (1996) carried out an empirical study for Spain to estimate the influence on the hazard of leaving unemployment of individual characteristics - especially whether the worker receives benefits or not - and of the business cycle,

²⁰ The decrease in weeks worked determined by a 1 per cent increase in non-wage income is larger for UI beneficiaries than for non-beneficiaries (the income elasticities being respectively -0.2 and -0.03 per cent), while the opposite result was discovered in a comparison of the wage elasticities of the two equations (0.04 per cent for recipients and 0.07 per cent for non-recipients).

while controlling for duration dependence. The study is based on a newly released dataset of a rotating panel sample of unemployed men from the Spanish Labour Force Survey during the period 1987-1994. The findings of their experiment indicate that receipt of unemployment benefits significantly reduces the hazard of leaving unemployment. The reduction in the hazard falls as duration increases, closing up after one year of unemployment. As to the sign of the relationship between the business cycle and re-employment hazards, their results suggest a positive relationship, which means that favourable business conditions tend to increase the hazard. However, changes in the state of the business cycle affect the hazard of leaving unemployment to a significantly lower degree than the receipt of unemployment benefits. Therefore, they concluded that “for assessing the chances of re-employment of a given individual, it appears much more important to know whether he is receiving benefits than the state of the business cycle” (p. 34).

Commenting on the inadequacy of the measures of replacement rates presenting high values, *Dilnot and Morris (1983)*, stressed that they failed to take account of the expected future changes, that no discounting procedure was adapted and that tax rebates are either ignored or inadequately treated.

Using a theoretical analysis based on the job-search model, *Ben-Horim and Zuckerman (1987)* showed that unemployment insurance benefits could even decrease the expected duration of unemployment induced by search. An unemployed person who has to finance search from limited resources may use the benefits to intensify search effort and lower the expected duration of unemployment.

On the basis of a review of the literature on determinants of unemployment duration, *Layard et al. (1991)* conclude that the elasticity of expected duration with respect to benefits is generally in the range 0.2-0.9 depending on the state of labour market and the country concerned.

On the basis of an extensive review of literature on that topic, *Blank and Freeman (1993)* conclude that there is little evidence of a significant trade-off between social programmes and labour market adjustment: even if there is some evidence showing the behavioural responses to the incentives of unemployment benefits programmes, no definitive consensus has been yielded over whether the magnitude of this response is large or small. In line with this conclusion, *Moffitt (1992)* has summarised the literature on the effect of welfare support on the labour supply of recipients in the US by stressing the “considerable uncertainty regarding the magnitude of these effects” (p. 16).

Atkinson and Micklewright (1991) gave a critical review of the traditional trade-off between the adequacy of the benefit levels and their disincentive effect in increasing unemployment at the expense of employment. According to them, this is a dangerous oversimplification and they point to two main misleading features of the trade-off view. First, both unemployment and employment are not homogeneous: it is necessary to distinguish several different labour states in order to allow for a richer treatment of the labour market. Secondly, they stress on the importance of the institutional features of unemployment compensation, in particular with respect to the distinction between insurance and assistance, considering that the trade-off view mistakenly assumes that

the impact of unemployment compensation can be summarised in terms of the level of benefit.

Atkinson and Micklewright conclude that the findings of much of the literature on the effect of unemployment benefits levels or replacement rates on the probability of exit from (and entry to) unemployment, are far from robust. In focusing on benefit levels, this treatment ignores other dimensions of unemployment compensation, whose effects may be more important (i.e. the influence of benefit duration). It takes too simplistic a view of the way in which unemployment benefit works in the real world. Finally, exit from unemployment may have quite different consequences depending on the destination. This review of the evidence leads them to conclude that there may be adverse effects on the incentive for the unemployed to leave unemployment, but that these are typically found to be small and that there is little ground for believing that much voluntary quitting is induced by the unemployment insurance system. Moreover, the richer view of the relationship between unemployment compensation and the labour market allows for identifying some of the ways in which it may have a positive, rather than a negative, impact. Unemployment insurance (more than assistance) may have positive effects in encouraging labour force participation (Friedman 1975) and favouring regular rather than marginal employment and, if without an income test, it does not involve high marginal tax rates on the earnings of other family members. In arguing for a richer view of both the labour market and of unemployment compensation, they have also been arguing for greater care in making international comparisons.

Blundell (1997) summarises some of the most comprehensive analyses of the impacts of unemployment durations and benefit levels. A wide range of studies have found rather small effects of replacement rates on return to work probabilities. But since job search within work can be as efficient as search during unemployment, the only effect of replacement rates is through the value of 'leisure', or perhaps more accurately the value of non-market activities (looking after children etc.). The estimated elasticities of exit from unemployment with respect to the net replacement rate for men can be concluded to be around -0.5 . This would imply that a 50 per cent rise in unemployment income would reduce the exit probability by around 20 per cent in a given period. However, he warns of the caveat that the analyses have ignored to look at which labour market state the unemployed individuals are moving to. Given the growing numbers in early retirement, long-term sickness and on training programmes, the analyses miss important features of labour markets. Ignoring these alternative labour market states probably results in under-estimates of the effect of unemployment income on the return to work probability.

Haveman (1995 and 1997) summarises discussions of strategies for employment-centred social policy reform saying that no single policy is capable of assuring both adequate income support to those without sufficient earnings (i.e., poverty reduction) and stimulating an increase in the employment of low-skilled workers. The "iron law" of income support needs to be emphasised again: an income guarantee assuring all citizens of an "adequate" level of living financed via a personal income tax requires a structure of marginal tax rates implying substantial work disincentives. The higher the guarantee, the more severe the work disincentives. High guaranteed incomes and strong work incentives are incompatible objectives.

Lindbeck (1997) argues that distortions connected with benefits are more far-reaching than only the effects on labour supply, in particular, on hours of work which are most often covered in studies of benefit disincentives. He assesses that the most severe problem inherent in various benefit systems is probably that, like private insurance, they are plagued with moral hazard, as the individuals are able to adjust their own behaviour to qualify for benefits. The basic dilemma is that the more generous the welfare state is the more people qualify for benefits and take them up.

Buti, Franco and Pench (1997) summarise the message from literature on the unemployment effects of benefits in the following:

- (i) The estimated effects of the levels of benefits on the length of unemployment are relatively modest. In some European countries, replacement rates are high and, as a consequence, the disincentives are potentially important, mainly for low-wage and 'fringe' workers as well as families with children.
- (ii) The duration of benefit is generally estimated to have a significant affect on the length of unemployment.
- (iii) National institutional characteristics can considerably influence the effect of unemployment compensation: the tighter the administration of benefits, especially concerning job-search requirements, the lower the effect.
- (iv) Unemployment compensation does not only affect the probability of leaving unemployment for employment but also the whole range of labour market transitions. For example, a cut in benefits will tend to reduce unemployment also by increasing withdrawals from the labour market.