

**Actual and Potential
Recipients of Welfare Benefits
with a Focus on
Housing Benefits, 1987 - 1992**

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**Actual and Potential Recipients of Welfare Benefits
with a Focus on Housing Benefits, 1987 - 1992
Study no. 4**

Published by:

The Rockwool Foundation Research Unit

Linguistic adviser:

Tim Caudery

Address:

The Rockwool Foundation Research Unit

Danmarks Statistik (the Danish Central Bureau of Statistics)

Sejrøgade 11

DK-2100 Copenhagen Ø

ISBN 87-90199-14-6

ISSN 0908-3979

June 1997

Print run: 400

Printed by Danmarks Statistik

Distributed by:

Danmarks Statistik

Sejrøgade 11

DK-2100 Copenhagen Ø

Telephone +45 39 17 39 17

Fax +45 31 18 48 01

Price: DKK 132.00, including 25 % VAT

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Preface

In 1996, the Rockwool Foundation Research Unit began work on a major research project on the theme of 'Citizens and the Laws', with publication of the results planned for 1998. The aim of the project is to study recent developments and changes in Danes' behaviour, moral attitudes, and perceptions of risk with respect to breaching the law. Where changes are found to have taken place, the reasons for them are investigated.

Closely associated with this main research theme is the question of the extent to which citizens avail themselves of the welfare benefits to which they are entitled. If there has been a general shift in moral attitudes, one might expect there to have been a subsequent effect on the take-up of benefits.

During the preparatory stages of the project it became evident that there was a common interest in analyses in this area of take-up for both the Research Unit and the Ministry of Economic Affairs. Consequently Hans Hansen PhD, former Chief of Section at the Ministry of Economic Affairs and now a senior researcher at the Institute for Social Research, together with Marie Louise Hultin M.A. of the Research Unit, began working together on further analysis of the results that had been produced using the Ministry's 'Law Model'.

Once this sub-project had started, it was found that it would be useful to extend the original planned analysis work with other analyses based on the abundant material contained in data registers on housing benefit, family composition, income, etc. at Danmarks Statistik, the Danish Central Bureau of Statistics. These analyses contain i.a. a housing benefit model especially developed with reference to calculations of take-up.

The studies based on the Ministry of Economic Affairs' Law Model and the registers at Danmarks Statistik have now progressed to the point where it seems relevant to publish the results obtained so far. Accordingly, the analyses appear in this book, *Actual and Potential Recipients of Welfare Benefits with a Focus on Housing Benefits, 1987-1992* by Hans Hansen and Marie Louise Hultin. The book was published in March, 1997, in Danish under the title *Aktuelle og potentielle modtagere af velfærdsydelser med hovedvægt på boligstøtten 1987-1992*, and both publications are distributed by Danmarks Statistik. Work on this research area continues as part of the main project, and the publication of the main project results in 1998 will include further coverage of the problem of take-up.

In connection with the publication of this first report for the project I would like to give particular thanks to Marianne Jelved, the Minister for Economic Affairs, and to Michael Dithmer, Head of Department at the ministry, for their great help and co-operation with respect to the use of the Ministry's Law Model. I would

also like to thank Jan Plovsing, Head of the Government Statistical Service, whose co-operation has been invaluable in the production of this book. Finally, my thanks go to the Unit's secretary, Hanne Lykke, for her work on layout and preparation of the Danish and English language manuscripts for publication.

Copenhagen, May 1997

Gunnar Viby Mogensen

1. Actual and potential recipients of welfare benefits

1.1 Introduction

The Rockwool Foundation Research Unit has, over a number of years, carried out research on the shadow economy in Denmark. Up until now, this work has been concentrated on the financial reasons for the growth of the shadow sector. Non-financial factors such as morality and the perceived risk of punishment have not hitherto been included.

If moral standards and the perceived risk of sanctions are to be satisfactorily taken into account as far as fiscal matters are concerned, it will be necessary to examine behaviour, morality and perceived risk of sanctions in *other* areas which are subject to legislation – and indeed it is hardly possible to ignore areas not affected by law, for example levels of honesty, or personal integrity in the behaviour of spouses towards one another.

The Research Unit's project entitled 'Citizens and the Laws' was therefore initiated to take a closer look at such non-financial factors. Its aim is to obtain an overview of developments in morality, primarily with respect to changes in the attitudes of the populace to the law – fiscal legislation, social legislation, traffic regulations, criminal law, etc. – and to people's conception of what constitutes breaking the law.

The project will seek to establish how 'morality' (interpreted in this context as 'propensity to abide by the law') has changed in Denmark during the last twenty to thirty years, and to determine what may be behind such changes as might have occurred. The project will also examine possible parallel changes in ways in which the law is regarded, investigating such changes in attitude through an examination of actions which fall just short of breaking the letter of the law, while at the same time clearly breaching its intention.

When examining attitudes to the law, it is a natural progression also to examine the degree to which citizens avail themselves of their rights to state benefits. As we shall see below, for a number of types of benefit, 10-20% and sometimes more of those entitled to claim do not take up their rights.

If it is the case that today an increasing number of people break the law, or make use of its provisions in ways that breach its intent, it may well be that an increasing proportion of those legitimately entitled to claim state benefits do, in fact, decide that they want to claim them. For why should one hold back from making claims on state benefit payments oneself, if everyone else has 'helped themselves'? If, then, there has been a general change in moral standards, this may affect the take-up of welfare benefits.

This sub-project has as its goal an investigation of part of precisely this matter, namely *the phenomenon of take-up, and of changes in the take-up rate over time*. On the basis of calculations made using the Law Model developed at the Ministry of Economic Affairs, it will show the extent to which Danes avail themselves of their legal entitlements to welfare benefits.

The Law Model comprises a set of computer-based calculation models which incorporate data on the Danish legislation on personal income tax, public pensions, housing benefits, use of day-care centres, etc.. The model also includes data for a representative sample of Danish families. These data make it possible to calculate each family's tax liability, together with their entitlement to housing benefits, state old-age pensions, and other major benefits. The model enables such calculations not only on the basis of existing legislation, but also on the basis of proposed revisions of the law, thus making it possible to see the costs and effects on welfare payments of possible changes to the laws relating to taxation and benefits. The model is especially well suited to calculating the effects on families who are already covered by the relevant legislation, and can also produce some data for families who are now or could become potential recipients of benefits.

It is this last possibility which forms the basis for the Law-Model-based investigation described in this volume of the extent to which citizens make use of their entitlement to various benefits. In this context, special weight is placed on housing benefits, but other benefits for which it is possible to make take-up calculations are also included.

A new analysis of data material based on official records is used to focus in particular on take-up of housing benefits, and on changes in the take-up rate for housing benefits in the period 1987-1992. The new calculations produced from these data are also used to identify characteristics of those individuals who do not claim housing benefit despite being entitled to it, and to see what distinguishes these people from actual claimants.

The new data material is longitudinal, allowing the same families to be monitored from year to year. No attempt has been made before in Denmark to use such a method in this field. One of the new perspectives which can be examined in this way is the extent to which non-take-up of housing benefits is a result of delays in claiming it, i.e. the interval between the time from which people become entitled to benefit and the time from which they begin to claim.

The new data material comes from data registers at Danmarks Statistik, the Danish Central Bureau of Statistics, and it provides a range of completely new possibilities for the measurement of take-up *behaviour*. However, the material does

not directly indicate the reasons *why* welfare benefits are not claimed by all eligible individuals. A number of possible reasons, including some connected with moral issues, will nevertheless be discussed in this volume. The actual analyses also give a certain indication of the explanatory power of each factor. A combined and deeper analysis of the reasons for non-take-up of welfare benefits will form part of the report on the survey-based investigation on which the main part of the 'Citizens and the Laws' project is based.

The concept of take-up will be defined in the next section of this chapter. The possible reasons for failure to claim benefits will also be discussed, this discussion being based on material in international research and literature covering this area. First, however, there follows a brief overview of the contents of the remaining chapters in this book.

Chapter 2 contains a presentation of earlier investigations related to take-up which have been conducted in Denmark on the basis of law models. Particular emphasis is given to studies related to housing benefits conducted using the Ministry of Economic Affairs' Law Model. Numbers of potential claimants in certain other areas which can be calculated using the same method are also discussed.

On the basis of the new calculations and using consistent measurements, a time series for housing benefits for the period 1987-1992 is presented in Chapter 3. These calculations primarily concern tenants. An attempt is also made to see how the characteristics of potential and actual beneficiaries differ, and the possible reasons for this are discussed.

Chapter 4 deals with the dynamic aspects of the housing benefit regulations. The period over which claimants receive housing benefit is investigated, as is the extent to which benefit claim omissions are the result of delays in obtaining benefit.

Chapter 5 contains a summary of the preceding chapters.

1.2 The concept of take-up

This section gives an account of how take-up is calculated, and of what may be assumed to underlie the phenomenon.

There exist a number of individuals, families and households who are entitled to welfare benefits, but who do not actually receive them. These are termed *potential recipients* in this book, regardless of whether we are talking about an individual, a family or a household. In contrast to these, there are the people who do receive benefits; these are termed *actual recipients*.

In order to evaluate whether the number of potential recipients can be regarded as large or small, it is often compared with the number of actual recipients. This is done indirectly by calculating the proportion of entitled recipients who actually do receive benefit. This proportion is termed the *take-up*.

However, in calculating who is entitled to a particular welfare benefit, it is sometimes found that some of the actual recipients do not in fact appear to be entitled to the benefit. Thus, take-up calculations can either be based on all those who are actual recipients, or, if one wishes to take the problem named above into account, just on those actual recipients who also appear from the calculations to be entitled to the benefit. This conceptual problem is discussed at greater depth in, for example, Duclos (1992a).

The choice of method for this analysis cannot be based on research conducted in Denmark, where, as mentioned previously, the phenomenon of take-up has not been systematically investigated. On the other hand, systematic research has, for example, been conducted in the United Kingdom, where the take-up rate is measured regularly for a number of means-tested welfare benefits (see Department of Social Security, 1995). Both methods of calculation have been used in international studies involving calculations of the take-up rates for different benefits. Thus, Atkinson (1989) and the Department of Social Security (1995) calculate take-up rates on the basis of all actual recipients, while Blundell *et al.* (1988), Fry and Stark (1991) and Dorsett and Heady (1991) calculate take-up rates on the basis of those actual recipients who also appear from the calculations to be entitled to the benefit.

In making the choice of method for this study, we have taken account of both the validity of the calculations of the potential recipients, and the reliability of the methods used in practice by the authorities in allocating benefit.

In the following sections, the measurements of take-up rates are based on the *total number of actual recipients*. This is because, although the calculations of potential recipients involve a certain degree of uncertainty, it can be safely assumed that the authorities distribute benefits strictly in accordance with the relevant regulations. Of course, the Ministry of Economic Affairs' Law Model cannot be based on the assumption that errors never occur in distributing benefit. There may, for example, be inaccuracies in the information about income or rent which forms the basis for determining entitlement to benefit; and these errors would also be present in the data registers used in the Law Model.

Calculations of take-up rates are carried out as follows in this volume:

$$\text{Take-up (numbers)} = \text{Actual recipients} / (\text{Actual recipients} + \text{potential recipients}) * 100$$

$$\text{Take-up (expenditure)} = \frac{\text{Total benefit distributed to actual recipients}}{(\text{Total benefit for actual} + \text{potential recipients})} * 100$$

A distinction is made in the above between take-up rate in terms of numbers of recipients and take-up rate in terms of expenditure on benefit distributed. Take-up in terms of numbers shows the proportion of those people who are entitled to benefit who actually claim it. Take-up in terms of expenditure shows how large an amount of money is paid out in proportion to the total amount which would be paid out if all those who were entitled to benefit actually claimed it.

It is normally the case that the take-up rate calculated on the basis of number is lower than the take-up rate calculated on the basis of expenditure. This is because those who are entitled to a large amount of benefit more often claim their entitlement than those who would only receive a smaller amount.

The literature on the reasons for differences in take-up rates is marked by the fact that it considers these matters primarily from an empirical viewpoint, without there being an established theoretical basis. A survey of a number of the most important contributions on take-up can be found in Craig (1991). Generally speaking, the same three reasons are given to explain non-take-up. There may be a problem of information dissemination, with the result that potential recipients are not aware of their entitlement to benefit. Alternatively, applying for benefit may involve incurring various costs, which may be either financial, under which heading is included the expenditure of the time taken to make the application, or of a moral nature, in that some may consider it shameful to accept help from public funds. Blundell *et al.* (1988) describe an attempt to make an empirical investigation of the costs of claiming benefit. Finally Atkinson (1989) suggests that non-take-up may be due to delays in the process of applying for benefit, in that time may elapse between people becoming entitled to benefit and their claiming it. Craig (1991) states his view that the investigation of this problem is one of the most obvious areas for further research on take-up.

Another way of looking at the problem is proposed by Corden (1995), whose book stresses the relevance for take-up of the structure of the benefit system. Corden's work is in part based on an international study by van Oorschot and Kolkhuis Tancke (1989). The results of that study show that the probability of claiming benefit decreases as the complexity of the relevant regulations increases. If the regulations are numerous and complex, and if, in addition, the criteria for entitlement are unclear, there will be a lower rate of take-up – a smaller proportion of those who are entitled to the benefit will receive it. It was also found to be the case that if the benefit is distributed in accordance with social criteria, so that the recipient is, by receiving the benefit, placed in a cer-

tain category with people with whom he or she would prefer not to be associated, then this is also a disincentive to making a claim.

The probability of a claim being made is also lower if the benefit in question is only a supplement to other benefits, and if the initiative to apply for the benefit rests with the claimant alone. Furthermore, Corden states, the length of time for which the benefit is payable is also a factor for the take-up rate: if it can only be claimed for a short period, the probability that a claim will be made is less than if the benefit is payable for a longer period of time.

Corden's emphasis on the significance of the structure of the benefit system is not in conflict with the reasons named earlier for some potential recipients not making benefit claims. If the initiative to claim the benefit rests entirely with the potential recipient, then obviously the probability increases that lack of information will result in a claim not being made. Similarly, a large number of complex regulations, combined with unclearly defined criteria for allocation of benefit, will make it much more difficult for the potential recipient to find out about his or her entitlement. As well as lacking information on entitlement, the potential recipient will find it more difficult to make the claim if the regulations are very complex. Complex forms on which it is necessary to provide a great deal of information are also more difficult to complete. These factors increase the costs of claiming, and the likelihood of claims being made declines.

If social criteria are used in determining entitlement to benefit, or if making a claim appears to assign the claimant to a low-status social category to which he or she is unwilling to belong, these factors can be assumed to increase the moral costs of claiming. This can happen either because the potential recipient feels a reduction in self-esteem through making a claim, or because s/he believes that it may affect others' opinion of him or her.

Finally, it can be assumed that if a benefit is only a supplement to other forms of income, the perceived financial gain from making the claim will be less, and thus the probability of a claim being made will fall. The same is true if the benefit is only payable for a short time.

In the case of Danish welfare benefits, it is quite remarkable to what extent the structure of the housing benefit system fits the description above.

The Danish housing benefit regulations are numerous and complex, the criteria for eligibility are very involved, and eligibility depends on social factors. Furthermore, housing benefit is only a supplement to other income, and the initiative to apply for benefit is left entirely to the potential recipient. These considerations also apply in the cases of other benefits for which it has been possible to calculate take-up rates, namely free day-care places for children, special child

benefit payments for single parents, and heating supplements for pensioners. All things being equal, therefore, one would expect the rate of take-up to be relatively low for these benefits in comparison with certain other welfare benefits where the Danish benefit structure is different. Among these other benefits are the public old-age pension, subsistence allowance, and child benefit. In general, there are no costs of a social nature involved in accepting these payments, and the criteria for receiving them are quite clear.¹

It is interesting in this context to consider what the consequences of non-take-up might be. According to Lindbeck (1995), non-take-up of benefits should be viewed in connection with the social norms that form the very foundation of the welfare state. Even though it might seem natural to avail oneself of the payments available from public funds, there are social norms which prescribe that benefits will only be claimed if they are needed; this social norm 'barrier' means that not all those entitled to benefit will claim. Lindbeck therefore interprets an increase in take-up as indicating a change in the relevant social norms.

This explanation is very close to the concept of moral costs in claiming benefit presented earlier in this section. Non-take-up is thus seen as an expression of the individual's choice of claiming or not claiming benefits, with consequences to his/her own self-esteem, and to the moral judgements of others. Since non-take-up is therefore a consequence of the citizen's own decision, it should not be viewed as a problem. On the contrary, it is pleasing to note that there are people who save the public authorities considerable expenditure by not claiming the welfare payments to which they are entitled.

However, Atkinson (1989 and 1995) has stressed several times that non-take-up does have certain implications related to benefit distribution – implications which mean that action should be taken. For this reason, it is important to be aware of the interrelationships between the individual welfare benefits and other benefits. If there are no other benefits that citizens can claim instead, the implication of non-take-up must be that some people are existing at below the minimum level which the welfare state aims to ensure for all.

Even if there are other forms of benefit which can bring claimants above the minimum standard of living, Atkinson believes that the phenomenon of non-

¹ However clear the structure of the benefit system, there will of course be a small group of people who still have problems in this area. In a sample taken for the Rockwool Foundation Research Unit project on 'Welfare and Incentives', 666 of the 4,210 respondents described themselves as unemployed, though 10% of them actually received neither unemployment pay or income support (Pedersen and Smith, 1995). A survey conducted at the end of the 1960s and the beginning of the 1970s in connection with work on social reform revealed that of those interviewed, 10% of men and 20% of women were unaware that they were covered by the unemployment insurance scheme (Westergård, 1971).

take-up may still be interpreted as an expression of some deficiency in the existing social system. Non-take-up can be seen as an indication that claiming the benefit involves significant costs – not just in the case of those who do not claim the benefit, but also for those who do. If several benefits involve heavy costs in claiming, this means that there is a significant loss of welfare as a result. Actual recipients will thus regard the value of the benefit as being significantly less than the amount paid out by the public authorities.

We will return later to Lindbeck's and Atkinson's interpretation of the implications of non-take-up. First, however, we will present the results of the earlier studies related to Denmark which were based on law models.

2. Law Model calculations of take-up rates: earlier work in Denmark

2.1 Introduction

As already mentioned in Chapter 1, analysis of take-up rates has not been carried out regularly in Denmark. It is normally assumed that those who have the right to benefits also receive them.

This does not mean that everybody has indeed received their benefits. Receiving income support could, especially in the not-too-distant past, imply some kind of social stigma; this would discourage some people from claiming the benefit even when they were eligible for it. Student grants are another area where take-up is not complete; some students may prefer to work part-time instead of receiving grants. This will be the case especially for the part of the grant which is paid out as a loan and will have to be repaid later.

Nevertheless, considerations of take-up are of course felt to be important in Denmark. Take-up in connection with early retirement benefits and other schemes connected with withdrawal from the labour market, for example, is monitored closely – though not in terms of take-up rates, but in the form of regular statistics concerning movements in and out of these schemes. This is also the case for the ‘paid leave’ schemes introduced on the labour market some years ago. The examples mentioned involve a change of status for the recipient. A person opting for early retirement has chosen to give up working, either partly or entirely. Other persons who are also entitled to early retirement may choose to continue working instead. There is clearly some kind of trade-off involved in these cases; one gives something up to receive something else.

It is different for a person who does not take up his or her entitlement to income support, housing benefit, or family allowance. In these cases there are no trade-offs, at least not in a financial sense; the person could simply increase his or her income by receiving the benefits to which he or she is entitled. It is in this sense of the term that take-up will be discussed here.

There is no systematic recording of take-up rates in the Danish tax/benefit system; there is not even a Danish word to describe the concept of take-up. It is, as has already been mentioned, assumed that all or almost all receive the benefits they are entitled to.

It is known, however, that for housing benefit this is not quite the case. For this benefit scheme there have been some attempts to calculate the number of ‘poten-

tial' recipients, i.e. those families who could but for some unknown reason do not receive housing benefit. Two of these attempts will be described below.

For the purposes of this study, estimates of the number of potential recipients have also been made for certain other benefit schemes, namely subsidies for child day-care payments, child allowances for single parents, and some elements of the public pension scheme. The estimates presented here have been made by the Law Model office in the Danish Ministry of Economic Affairs.

2.2 A history of Danish housing benefit legislation and attempts to estimate potential recipients

Housing has long been subsidised in Denmark; the system has a history going back to the First World War, when rent subsidies were provided to breadwinners. After a number of adjustments to the system, legislation was passed on housing benefit in 1967, which forms the basis for the current legislation.

The reason for the 1967 Act of Parliament on housing benefit was that in 1966 it had been agreed that the system of rent control would be ended. It was expected that this agreement would lead to significant rent increases. In order to make it possible for people who would have difficulty in paying the new rents, for example pensioners and families with children, to live in housing of a reasonable standard, the rent subsidy was passed into law in order to compensate for the expected rent increases. In fact, the agreement on ending rent controls was never implemented, but the rent subsidy legislation was not withdrawn. The number of beneficiaries under the scheme rapidly reached the level of approximately 200,000.

In 1979 the regulations for pensioners were made more generous, with a special scheme being introduced of housing benefit for pensioners. The aim of this change was 'to reduce the housing costs of pensioners and thereby obtain an increase in their standard of living, to better allow/encourage pensioners to remain in their own homes, and to even out differences in pensioners' housing costs'. Expenditure on this system of housing benefit for pensioners has risen dramatically since the inception of the scheme in 1979.

The regulations concerning housing benefit for pensioners and non-pensioners have been amended many times since, often in connection with changes in the law in other areas, e.g. income tax and pensions. One consequence of these many alterations has been that the regulations for housing benefit have become complex and difficult to understand. A major simplification of the system was carried out in 1991, though the basic structure was not altered. Appendix 3 gives information on the regulations for the two housing benefit schemes.

It is still, generally speaking, the case that housing benefit for pensioners is more generous than housing benefit for non-pensioners, especially for families without children, for whom housing benefit is very limited (a maximum of 15% of the standardised housing costs). For such families the amount of benefit provided is usually relatively low. Over the past ten years various proposals have been made for fundamental reforms of the system. Most of these have favoured a unified system of housing benefit, with benefit for pensioners being cut back somewhat. However, despite the facts that lengthy periods of transition have been suggested, and that the income prospects for future generations of pensioners appear good, it has not yet been possible to obtain sufficient backing for such proposals for reform.

The first attempt to estimate how many potential recipients of housing benefit there are and the expenditures that would be related to them was made in connection with a 1988 Danish Ministry of Housing and Building report entitled *Boligmarkedet og Boligpolitikken – et Debatoplæg* (The housing market and housing policy – a discussion document). This was the first report from the Ølgaard committee.

The report included a proposal – which was never implemented – to deregulate the Danish housing market for rented dwellings. One consequence of the proposal would have been rent increases in several sectors of the housing market. This would in turn have resulted in increased expenditures on housing benefit for the current recipients, and in addition a new group of people would have become entitled to claim housing benefit. The Law Model was used to first calculate the potential recipients under the existing regulations, and then to estimate the potential for claims under the proposed new scheme. This approach did not produce an estimate of the total number of new recipients, but did give an impression of the overall effects that the proposal would have. These calculations were not included in the report; they were made for the use of the Housing Ministry.

The next attempt at estimates of potential recipients of housing benefit was made in connection with a report from the Danish Ministry of Housing and Building entitled *Udgiftsvækst for Individuel Boligstøtte* (Increases in the costs of housing benefit for individuals) dated 1991. The estimates presented there, which were for the years 1986 and 1989, were used to assess the significance of potential recipients for the increasing expenditure connected with the housing benefit scheme. The conclusion reached was that potential recipients were of only minor significance.

A third set of calculations was published in a Finance Ministry report entitled *Individuel Boligstøtte* (Housing benefit for individuals). The report was published in April 1995, but the calculations of potential recipients were for the year 1992.

There are significant problems of theory and practice concerned with carrying out calculations concerning potential benefit recipients, and these have led to many alterations in the methods used for making such analyses. These are described further in Appendix 1. One of the main problems was, and still is, to impute the rents for the large proportion of families for whom that key information is not available. Because of these methodological alterations, the calculations described above do not constitute a consistent time series of estimates of the potential recipients of housing benefit in Denmark.

Such a time series can only be created satisfactorily by using the dynamic method which underlies the analysis described in Chapter 4 below.

However, it may still be of interest to describe the first of the three cross-sectional analyses mentioned above as a separate study, since it is well-documented. It provides an estimate of potential recipients of housing benefit for 1986, and it is described in Section 2.3 below.

This analysis would be of greater interest if it could be compared with a later cross-sectional analysis. Such an analysis, of the potential recipients of housing benefit for 1993, has been made especially for this purpose by the Law Model Office at the Ministry of Economic Affairs. It is an updating of the 1992 study in the Finance Ministry report mentioned above. The results are given in Section 2.4 below.

2.3 The estimate of potential housing benefit based on 1986 cross-sectional data

The housing benefit rules are very detailed and rather complex. It therefore requires the collection of a substantial amount of precise information to set up a case study for a potential recipient of housing benefit.

This information is of course available for the actual recipients, but not to the same extent for those who are not actual recipients. However, in order for the Law Model Office to carry out the analysis based upon 1986 data requested by the Housing Ministry, it was necessary to create 'case files' for all the families who were not actual recipients, and then let these families be checked according to the eligibility criteria in the housing benefit model, in order to establish with the greatest possible certainty which families were among the potential recipients. The results of this procedure based upon cross-sectional data for 1986 (the 'large' Law Model sample for that year, using data for one thirtieth of the entire population) are shown in Table 2.1. For more technical details, see Appendix 1.

The group of potential recipient families in 1986 included approximately 71,000 potential recipients of housing benefit for non-pensioners, with a potential benefit cost of close to DKK 280 million, and almost 42,000 potential recipients of hous-

ing benefit for pensioners, with a potential cost of approximately DKK 300 million.

It is evident that the potential recipients in the pensioner sector of the scheme would have been much more expensive (approximately 80% more expensive) than the potential recipients in the non-pensioner element of the scheme. This was primarily because families without children constituted such a substantial proportion of the potential group (80%) in the non-pensioner part of the scheme, where the maximum housing benefit is 15% of the adjusted rent for families without children. There is no similar constraint on housing benefit for pensioners. Housing benefit for pensioners is in fact, generally speaking, more generous than housing benefit for non-pensioners, but the greatest difference appears in the case of families without children.

Table 2.1. Potential housing benefit recipients and expenditure, 1986. Tenants.

Family type	Number of families	Average rent DKK	Total housing benefit, DKK millions	Average housing benefit per family, DKK
Housing benefit for non-pensioners				
Single persons	57,870	22,212	203	3,507
Without children	49,770	21,529	132	2,643
With children	8,100	26,411	71	8,814
Couples	13,590	28,102	75	5,489
Without children	7,140	25,591	22	3,075
With children	6,450	30,882	54	8,162
Total	71,460	23,333	278	3,884
Housing benefit for pensioners				
Single persons	34,560	18,714	252	7,292
Without children	34,380	18,692	250	7,271
With children	180	22,799	2	11,310
Couples	7,350	24,406	44	6,014
Without children	6,780	24,356	39	5,777
With children	570	24,995	5	8,833
Total	41,910	19,712	296	7,068

Source: Law Model calculations related to the proposals from the Ølgaard committee (see Section 2.2 above).

Before a closer interpretation of the results is attempted, it will be useful to present the statistics for actual recipients of housing benefit in 1986. These are shown in Table 2.2.

Only families living in rented dwellings are included in Tables 2.1 and 2.2. For technical reasons, the information on the actual recipients given in Table 2.2 is based on the data for one month, December 1986. The amounts (total benefits and benefits per family) are presented on an annual basis, but should be interpreted as

‘December annual rates’, i.e. the way the year would have looked like if all months had been like December.

The data for potential recipients are technically a little different. The information on family types (family size and composition) is from January 1987, not far distant from the time of the data for actual recipients. The information on rent is for the dwellings where the families were living in January 1987, but the levels of rent used in the calculations were at 1985 prices. The rent levels were adjusted to average 1986 levels, as described in the Appendix 1. The annual income used was the actual income 1986; this figure was used as a proxy for expected future income, which, in the final analysis is the income basis used for new applicants for housing benefit.

Table 2.2. Housing benefit, actual recipients, 1986. Tenants.

Family type	Number of families	Average rent DKK	Total housing benefit, DKK millions	Average housing benefit per family, DKK
Housing benefit for non-pensioners				
Single persons	78,826	25,974	636	8,161
Without children	34,751	20,300	100	2,880
With children	44,075	30,274	536	12,158
Couples	21,348	31,236	176	8,497
Without children	8,179	27,087	31	3,791
With children	13,169	33,498	145	11,041
Total	100,174	27,113	818	8,234
Housing benefit for pensioners				
Single persons	152,880	20,295	1,713	11,208
Without children	149,070	20,091	1,647	11,049
With children	3,810	28,195	67	17,386
Couples	40,530	25,804	424	10,455
Without children	36,810	25,285	372	10,096
With children	3,720	30,875	52	14,081
Total	193,410	21,447	2,137	11,051

Source: Law Model calculations related to the proposals from the Ølgaard committee, see Section 2.2 above.

This procedure is not without problems (see the discussion below on the size of the potential recipient group). But *if* the size and composition of the families were the same during 1986 as at the start of 1987, *if* the families lived in the same flats as in the start of 1987, and *if* the actual 1986 income reflected the future expected income, the calculated potential amount of benefit shown in Table 2.1 should be a reasonably good estimate of the benefits the families were entitled to, but did not take up. Even on these assumptions, however, the estimate still involves considerable uncertainty.

Table 2.3 is intended to throw further light on the results through a presentation according to family types. The table shows the take-up rates for the main groups of recipients in the housing benefit scheme in 1986.

It is evident that the take-up rate is much higher for pensioners than for non-pensioners, and that the groups of non-pensioner families where the 15% limit is applicable (i.e. families without children) have particularly low take-up rates. This result is in accordance with earlier comments in this chapter, and with the expectation of high rates of take-up for families with relatively high benefits (pensioners, and non-pensioner families with children), cf. Table 2.2.

Table 2.3. Percentage take-up rates for housing benefits, 1986. Tenants.

	Single per- sons without children	Single per- sons with children	Couples without children	Couples with chil- dren	All families
	----- Per cent -----				
Housing benefit for non-pensioners	41	84	53	67	58
Housing benefit for pensioners	81	95	84	87	82

Source: Derived from Tables 1 and 2.

The question has been discussed between the Housing and Economic Affairs ministries as to whether the potential housing benefit recipients and costs as presented in Table 2.1 might be overestimated. Some of the families in the potential group could be in the process of applying for housing benefit, and would therefore quickly leave the potential group. This possibility will be further discussed in Chapter 4. Another reason for the potential benefits to be overestimated could be that a temporary drop in income during the year would not make the family eligible for housing benefit if the family was back at its usual income level at the end of the year. Using the same argument, however, it would also be possible to suggest that the number of potential recipients is under-estimated, since some families would have missed being recorded in the potential group if the temporary drop in income occurred late in the year. In any case, in an *ex ante* situation it is hard to predict when the temporary situation (e.g. unemployment) would be over, and in the Law Model cross-sectional data it is not possible to monitor the same person or family over more than one year.

It is also possible to argue that the potential benefits may be underestimated. The standardising adjustments made to the actual rent in real housing benefit cases, for example with respect to building maintenance obligations and type of heating, which it is not possible to simulate for the potential recipients, lead to a larger rent being calculated for housing benefit purposes, and this calculation would increase

the size of the potential benefits. The family unit used in calculation of the potential group is also too large (it is not possible to simulate the exact unit), leading to an overestimation of certain figures, primarily those for income, and thereby to an underestimation of the potential benefits.

Overall, it is hard to balance these arguments for the size of the potential benefit payable being underestimated or overestimated, but it is clear that the estimate is associated with a degree of uncertainty, especially for non-pensioner families with considerable variation in their incomes even over short periods of time.

Table 2.3 shows the rate of take-up in terms of the number of recipients. As far as expenditures on benefit are concerned, the estimated cost of paying benefit to potential recipients would have been 34% of the actual costs (December annual figure) for the housing benefit scheme for non-pensioners, and 14% of the actual costs for housing benefit to pensioners. This is equivalent to a take-up rate in terms of expenditure of 75% for housing benefit for non-pensioners and 88% for housing benefit for pensioners. In both cases, the rate measured in terms of expenditure is significantly higher than the rate calculated in terms of numbers of recipients, as would be expected (see Chapter 1).

If actual and potential recipients are compared on the basis of the data in Tables 2.1 and 2.2, it can be seen that the average rent was somewhat lower among the potential recipient groups than for the corresponding actual recipient groups, though the difference was small for pensioners. The potential benefits were also lower than the actual benefits for the corresponding groups. These points reflect the fact that the rate of take-up in terms of expenditure is higher than that calculated in terms of number of recipients. In the case of pensioners, the difference is also due to incomes for potential recipients being higher.

2.4 The estimate of potential housing benefit based on the 1993 cross-sectional data

The 1993 calculation of potential housing benefit is of the same type as the calculation just discussed for 1986, but the methods used were somewhat different (the differences are explained more fully in Appendix 1). This makes a direct comparison of the results difficult. The results of the estimate of the potential housing benefit are shown in Table 2.4.

Potential recipients in 1993 included approximately 84,000 potential recipients of housing benefit for non-pensioners, with related costs of approximately DKK 420 million, and close to 36,000 potential recipients of housing benefit for pensioners, with related costs of approximately DKK 340 million. The potential recipients of housing benefit for pensioners would, on average, have cost 90% more in housing benefit expenditure than the potential recipients of housing benefit for non-pensioners. This is because families without children (especially single persons)

constitute the major part (82%) of this group, and they have a low maximum benefit (15% of the adjusted rent). This pattern is quite similar to what was found for the 1986 potential recipients.

The potential recipients group only included families living in rented dwellings, as in the 1986 calculation. This was also the case for the actual recipients, shown in Table 2.5. Pensioners living in special municipally-owned housing for elderly (which usually has a high rent) were excluded, the reason being that hardly any potential recipients lived in that type of dwelling. The reasons for this are the high rents for this type of accommodation, and the fact that the procedure for allocating the accommodation can be assumed to include information on housing benefit, which is particularly generous for these dwellings, because they are exempted from normal limitations of housing costs and rates in the rules. This correction was not made in the 1986 calculation, but only relatively few dwellings of that kind were available at that time.

Table 2.4. Potential housing benefit, 1993. Tenants.

Family type	Number of families	Average rent DKK	Total housing benefit, DKK millions	Housing benefit per family, DKK
Non-pensioner housing benefit families				
Single persons	71,058	42,925	310	4,370
Without children	63,492	43,489	220	3,472
With children	7,566	38,184	90	11,910
Couples	13,182	39,253	107	8,108
Without children	5,772	35,980	23	3,975
With children	7,410	41,802	84	11,327
Total	84,240	42,350	417	4,955
Pensioner housing benefit families				
Single persons	26,364	27,995	264	10,027
Without children	26,052	27,967	259	9,972
With children	312	30,376	5	14,658
Couples	9,594	33,640	75	7,803
Without children	8,424	33,278	62	7,373
With children	1,170	36,246	13	10,899
Total	35,958	29,502	339	9,434

Source: Law Model calculations for this study.

If one compares the actual recipients for 1993 and those for 1986, the overall impression is that of a heavy increase in both the number of recipients and in the total benefit costs. There were 76% more recipients of housing benefit for non-pensioners in 1993 than in 1986, and the costs had increased by even more for that group, namely by 136% in real terms. The recipients of housing benefit for pensioners increased in number by 37%, and the related costs by as much as 118%. The heavy increase in average benefit payment per pensioner family (by almost

60% from 1986 to 1993 in nominal terms) was to a large degree caused by a very substantial increase in the average rent (50%) paid by pensioners. This increase in average rent was accompanied by an increase in housing standards for new pensioner cohorts.

It can also be seen that the proportion of the average rent covered by housing benefit for pensioners rose from 52% to almost 55%. Other studies published in *Ældres indkomster og formuer, Finansministeret, april 1996* (Wealth and income of the elderly, Ministry of Finance, April 1996) show that in the same period the incomes of pensioners grew significantly more than those of people in employment. If one looks to the future and the coming pensioner cohorts, who will be greater in number as well as being better off than the present cohorts, then housing benefit for pensioners will be an extremely expensive system if public funds are to continue to pay a constant or increasing proportion of pensioners' increasing housing costs.

Table 2.5. Actual housing benefit recipients, 1993. Tenants.

Family type	Number of families	Average rent DKK	Total housing benefit, DKK millions	Average housing benefit per family, DKK
Housing benefit for non-pensioners				
Single persons	137,700	34,482	1,438	10,445
Without children	72,960	27,753	272	3,730
With children	64,740	41,408	1,166	17,737
Couples	38,850	42,214	497	12,797
Without children	14,520	36,761	72	4,923
With children	24,330	45,469	426	17,497
Total	176,550	36,183	1,935	10,962
Housing benefit for pensioners				
Single persons	211,860	31,059	3,796	17,918
Without children	205,260	30,735	3,636	17,717
With children	6,600	41,141	160	24,160
Couples	53,730	37,178	864	16,071
Without children	47,670	36,279	733	15,380
With children	6,060	44,248	131	21,500
Total	265,590	32,297	4,660	17,544

Source: Law Model calculations for this study.

On the basis of the information on potential and actual housing benefit in Tables 2.4 and 2.5, the take-up rates for 1993 have been calculated for the main groups of recipients. These are shown in Table 2.6. The estimate of the potential beneficiaries for 1993 again involves a degree of uncertainty, but because of methodological improvements this is probably true to a lesser extent than was the case for the 1986 estimate.

The general pattern seen for the take-up calculations for 1986 is also found for 1993 in Table 2.6. The pensioners had the highest take-up rates, and among the non-pensioners the take-up rate was again highest for families with children, who also received the largest amount of benefit.

As has already been pointed out, direct comparisons between the take-up calculations for the two years 1986 and 1993 are difficult because of methodological differences in arriving at the estimates. However, it would appear that it can be stated with a reasonable degree of certainty that take-up rates increased over the period under consideration. This is in accordance with the new results described in Chapter 3, which are based upon longitudinal data and a consistent method of estimating potential recipients for each year.

Table 2.6. Percentage take-up rates for housing benefits, 1993. Tenants.

	Single persons, no children	Single persons with children	Couples, no children	Couples with children	All families
	----- Per cent -----				
Housing benefit for non-pensioners	53	90	72	77	68
Housing benefit for pensioners	89	95	85	84	88

Source: Derived from Tables 2.4 and 2.5.

The potential costs for non-pensioner families were approximately 22% of the actual costs in the 1993 calculation, the corresponding proportion for pensioners being 7%. Both these figures are significantly lower than those in the 1986 calculation, where the proportions were 34% and 14% respectively. Expressed as take-up rates, the figures were 82% and 93% in 1993 for housing benefits for pensioners and non-pensioners respectively, as against 75% and 88% in 1986. Direct comparisons cannot be made, but it appears, not surprisingly, that the rate of take-up also increased in terms of expenditure over the period 1986 to 1993.

The potential recipients of housing benefit for pensioners had a lower average rent than the actual recipients in 1993, and the average value of benefit not taken up was approximately 54% of the average benefit for actual recipients. For the actual recipients, the benefit covered close to 55% of the average rent.

The potential recipients of housing benefit for non-pensioners had, in the case of single persons without children, substantially higher average rents than the corresponding group among the actual recipients. One explanation for this could be that some single persons with relatively high levels of rent suffered a fall in income, and thus moved within the scope of the housing benefit scheme without realising

it. Non-pensioner families are subject to variations in income to a much greater extent than pensioner families, and 1993 was a recession year.

On the basis of these findings, one might hypothesise that the number of potential recipients of housing benefits for pensioners is approaching a kind of 'saturation' point, also because the take-up rates for pensioners are very high.

The trend is less predictable for the non-pensioner potential recipients, where developments depend in part on the business cycle. There was an increase in absolute terms in the number of potential recipients of housing benefit for non-pensioners from 1986, a peak year in the business cycle, to 1993, a recession year; but not reflected in relation to actual recipients, since the number of actual recipients increased even more rapidly from 1986 to 1993. This suggests that economic recessions in fact influence especially the number of actual recipients in an upward direction.

2.5 Other benefit schemes

It is not a straightforward matter to calculate take-up rates for other benefit schemes in the Danish system either. The data required for this type of calculation are again administrative data derived directly from the administration of the tax/benefit system. For benefits, the available data only contain information on the actual recipients and their cases. These cases are often quite complex, and depend on very detailed information. In order to estimate the potential recipients of benefit it is necessary to establish 'case files' for all those people who do not already have them, and that is not always possible, or it can only be done with a considerable degree of uncertainty being involved, as in the case of housing benefit.

Another problem concerns the time dimension, which has already been mentioned in connection with potential housing benefit calculations. The general information available on family size and composition may originate from one point in time, while the information on the actual benefit case may relate to a different time. As a result, what is calculated as non-take-up could in reality be completely or partially due to this time difference.

Even though the information in the Danish administrative data is in general both comprehensive and of very good quality, it is far from perfect. Information on rent is only updated every fourth year in connection with general property assessments, and even then there may be delays in the collection of data, and it is not collected for all dwellings; this means that a substantial number of rents must be imputed (see Appendix 1).

One area where take-up calculations would be very relevant is that of income support (social assistance). In countries such as the Netherlands where there is a legal minimum income level and where income support is used to top up income

to this level, it would in principle be possible to calculate the take-up rate for this scheme. In Denmark, where the eligibility criterion for income support is that a welfare need should 'arise', it is close to impossible to calculate the potential recipients.

Apart from housing benefit, it has only been possible to calculate the potential for subsidies related to payments for child day-care institutions and for special child allowances to single parents. Calculations for take-up of certain elements of the public pension scheme have also been made.

Subsidies for payments for child day-care institutions

The subsidy scheme for the payments for child day-care institutions is for families with low incomes. The subsidy covers the full payment for families with an income below a certain threshold. Above that level, the subsidy is gradually reduced until a ceiling income level is reached, above which parents have to pay the full price of child day care. It is necessary to apply for the subsidy.

At the start of 1993, the parents of 27,000 children paid reduced rates or nothing at all for child day care. The annual cost of the subsidy was approximately DKK 160 million. The number of potential recipients of the subsidy was estimated as being approximately 5,000 children, with a related potential cost of DKK 24 million. The take-up rate (based upon the number of children) was thus close to 85 per cent, and the potential additional cost of the subsidy was 15 per cent of the actual subsidy, equivalent to a take-up rate in expenditure terms of 87%. The estimate of the potential is based upon income for the whole year (1992), and this may have caused exactly the same problems as were discussed in relation to the estimates for potential recipients of housing benefit. It may be that some of the potential recipients were in the process of applying for the subsidy. For this scheme there are no calculations based on longitudinal data against which the hypothesis can be checked.

Special child allowances for single parents

All families in Denmark with children living at home receive ordinary family allowances. Single parents are also entitled to one ordinary child allowance per child, and to one extra child allowance regardless of the actual number of children. The family allowances are paid out automatically (from the Danish Ministry of Taxation), while the special child allowances for single parents have to be applied for.

The Law Model estimate of the potential recipients of this benefit is approximately 5,000-6,000 families for 1993, giving a take-up rate of approximately 95% for these allowances (measured on the basis of number of families). There are no cost estimates available, but it could be assumed that the

potential costs are approximately 5-6% of the actual costs, depending on how many children there are in the potential recipient families compared with the actual recipients. There is no means testing of these benefits.

There is quite a lot of uncertainty involved in this estimate, because there was a time gap of three months between when the information on the actual recipients was collected and the compilation of general information on family size and composition. If no benefits were paid out for a particular child who was the dependent of a single parent, it may be because the original family (couple) was dissolved in the period between the two registrations, and the single parent may have been in the process of applying for the allowances. Again, longitudinal data could reveal to what extent this was the case.

Elements of the public pension scheme

Persons aged 67 years or more are in general entitled to an old age pension. It should therefore in principle be easy to find the persons aged 67 years or over not in receipt of an old age pension. This is indeed possible, but it is not then obvious why such people are not pension recipients. Some may not have taken up their pension, and others may not have any entitlement because they have not been in the country for long enough. It is not possible to differentiate between these two reasons in the Law Model data sample, and therefore not possible to calculate a meaningful take-up rate.

For a minor component of the public pension scheme, namely the personal supplement, it is possible to obtain an idea of the take-up for the heat allowance, a benefit aimed at reducing the costs of home heating for pensioners. Approximately 119,000 pensioners would probably have been eligible for that allowance in 1992, but did not take it up. The potential cost estimate, assuming the same average heating costs as for the actual recipients, would be approximately DKK 300 million. That assumption, however, probably results in an overestimate of the potential costs.

Another problem concerns the coverage of the data sample. The actual costs of the heat allowance were DKK 740 million in 1992 (accounting data), while the total costs amounted to only DKK 615 million calculated on the basis of the Law Model sample. The missing DKK 125 million must be deducted from the estimate of the potential costs, since it must be assumed that the potential recipient group in this case contains the missing actual recipients. This results in an estimate of DKK 175 million for the potential costs. The take-up rate for this item, calculated on the basis of number of families and on expenditure, would then be approximately 80%, though this must be considered a very uncertain estimate.

The final example is not a direct take-up calculation in the way that the concept is used in this study. It concerns a part of the invalidity pension scheme in which

labour market participants can continue in their jobs and receive a supplementary invalidity benefit. This is an option which can be chosen by the individual concerned, the alternative being a full invalidity pension. Where individuals choose to receive the supplementary benefit and continue working, it can be assumed that this is the most financially advantageous alternative for them. The calculation concerns the additional costs that would be involved if the full pension were chosen instead of the supplementary benefit. 6,400 persons received the supplementary benefit in 1992. The estimate of the additional costs if these recipients had chosen the full invalidity pension scheme instead is close to DKK 0.5 billion before tax.

Overall, for the benefits for which attempts have been made to calculate take-up rates for 1992 or 1993, including housing benefits, take-up rates have been estimated to range between 68% and 95%, while the total amount of unclaimed funds remaining in the Danish Exchequer is estimated to be of the order of one billion kroner. Of this amount, the figure estimated for unclaimed housing benefits is around 750 million kroner, which is somewhat lower than the amount calculated using longitudinal data (see Chapter 3).

However that may be, the studies described in this chapter only give an indication of the situation as it stands at a particular moment in time. *Even if* it had been possible to make more analyses, and more reliable analyses, one would *nevertheless* have no way of knowing with certainty how the take-up situation was developing over time, since only dynamic analyses can show this.

The attempt made in this project to go further along this 'dynamic' road in order to discover trends in take-up rates for housing benefits is described in the next two chapters.

3. New take-up calculations for Denmark for the period 1987-1992

This chapter presents new figures for the take-up rate in the area of housing benefit for the period 1987-1992. The figures are based on calculations made using data from registers held at Danmarks Statistik.

The material consists of a 3% sample of Danish families in 1987 who were monitored through to 1992, and of a new 3% sample of Danish families in 1992 (see Appendix 2). The sampling design made it possible both to monitor the families' entries into and exits from the housing benefit system over a number of years, and also to estimate the number of potential recipients of housing benefit. The take-up rate could thus also be calculated. It was therefore possible to examine the longitudinal aspects of the situation, and these will be considered in depth in the next chapter.

The calculations are based on a purpose-designed housing benefit model, which is described in Appendix 3. The model is constructed on the basis of the legislation concerning housing benefit for individuals for the period 1987-1992. In contrast to previous calculations of take-up, these calculations are based on a composite model and a uniform method for the whole period concerned, so that the results are consistent over an extended period.

As has been shown in the previous chapter, earlier take-up calculations have been characterised by slight adjustments to the calculation method being made for each set of figures. This has made it difficult to compare the results for successive years, and thus to determine developments in the take-up rate.

Since the legislation in this area is relatively complex, and since the information required is not always to be found in the data registers available, the calculations based on the model are only approximate, and can only be used for 'standard' cases, i.e. normal housing benefit cases concerning tenants who are not covered by the special regulations relating to, for example, the handicapped, or pensioners living in special municipally-owned housing for the elderly. Similarly, regulations covering housing benefit paid in the event of forced rehousing are not taken into account in the model. For a more detailed description of such exceptions, see Appendix 3.

The model is used to calculate 'potential' claims; that is, in the first instance it is used to make calculations for families who are not actual recipients of housing benefit. As explained in Chapter 1, it has been decided to use the official figures for numbers of actual claimants as the basis for calculating take-up rates.

The model is used to determine whether an individual family appears to be entitled to housing benefit on the basis of the information contained in the data registers, and, if so, what the amount of such benefit should be. The most important factors in these calculations are the family's rent, income, and composition in terms of numbers of adults and children. A distinction is made in the model between housing benefit for pensioners and housing benefit which can be claimed by families of all kinds, but is normally only claimed by non-pensioners. Housing benefit for non-pensioners can only be claimed by tenants, while, in the period 1987-1992, housing benefit for pensioners could also be claimed by owner-occupiers and shareholders in co-operative housing associations. On the basis of the register data it is, however, particularly difficult to calculate a 'potential' housing benefit case for owner-occupiers and shareholders in co-operative housing associations. For this reason, the analyses are primarily concerned with tenants.

Families not in receipt of housing benefit, but who appear from the calculations to be entitled to it, are described as 'potential' recipients of housing benefit. The calculation of the total number of families in this category in the whole country is carried out using the grossing-up factors described in Appendix 2. The take-up rate can then be calculated on the basis of potential and actual recipients (see Chapter 1).

As can be seen from Appendix 4, there is a degree of uncertainty involved in the model-based calculations. This is not least because information about rents is only collected for buildings with more than two apartments which are let out, and even this process of information collection only takes place in connection with general property valuations, which take place in Denmark at quite widely-spaced intervals. The results presented in the following sections must therefore be interpreted with a degree of caution.

3.1 New take-up measurements

In accordance with the calculation methods described above, the take-up rate has been calculated on the basis of both numbers of claimants and amount of benefit paid out. The calculations have been made for each year of the period in question for the longitudinal material, and they have also been made for a cross-sectional sample for the year 1992. The longitudinal data material is based on a sample which in 1987 constituted a representative sample of Danish families; this material primarily reflects the changes that took place in these families over the course of time. However, although the data set is thus representative of the *changes* that took place in Danish families over a period, it is not certain that it continued to be a representative sample of data for all Danish families. However, since the families were only monitored over a six year period, there is a limit to how far their data could have deviated from that which would continue to constitute a representative sample. In order to have a means of measurement

of these deviations over time, the potential recipient calculations were also made for a new representative sample of Danish families taken for the year 1992. Thus, the results produced for the longitudinal data set can be checked by means of a comparison with the results from the representative material.

As can be seen from Appendix 2, the individuals in the longitudinal data set were in 1992 a little younger on average than those in the cross-sectional data set for 1992. The average age of the people in the longitudinal data set fell from around 38 years in 1987 to 36 years in 1992, while the average age in the cross-sectional data set for 1992 was 38 years. This fall in the average age in the longitudinal data set was not dramatic, but it could nevertheless have a certain significance for the calculation of the number of potential recipients. In parallel with the fall in average age, there were fewer pensioner families in the sample, and thus fewer potential *recipients of housing benefit for pensioners*. It can therefore be assumed that the number of potential recipients of housing benefit for pensioners gradually became increasingly under-estimated in the longitudinal data set. On the other hand, the number of non-pensioner families was greater in the longitudinal sample, and thus there were more potential *recipients of housing benefit for non-pensioners*. The number of potential recipients of housing benefit for non-pensioners must therefore be assumed to become gradually more and more over-estimated in the longitudinal data set, as discussed later in this chapter.

Take-up calculated on the basis of numbers of recipients

As can be seen from Table 3.1, there were in 1987 around 71,300 potential recipients of housing benefit for non-pensioners, equivalent to a take-up rate of 62%. In 1992 the number of potential recipients had increased quite steeply to 84,000, but the number of actual recipients had increased proportionally to an even greater extent, so that the take-up rate rose to 67%.

A possible explanation for the fact that both actual and potential recipients of housing benefit for non-pensioners increased in number between 1987 and 1992 may lie in the recession which Denmark experienced during that period. Since the recipients of this benefit are of an age to be active on the labour market, the recession could have led to more people becoming qualified for housing benefit as a result of reduction in income.

As expected, the number of potential recipients for 1992 was over-estimated in the longitudinal data set. This can be seen by comparing the longitudinal data material with the cross-sectional material for that year. The number of potential recipients of housing benefit for non-pensioners in the longitudinal data set is 95,300, compared with 84,000 in the cross-sectional material. The increase over time in the take-up rate is thus underestimated in the longitudinal data set.

Table 3.1 Take-up rate calculated on the basis of numbers of recipients, 1987-1992

	1987	1988	1989	1990	1991	1992	1992 cross- section
	----- number -----						
Housing benefit for non-pensioners							
Potential recipients							
Single, no children	44,100	46,100	53,700	58,800	58,000	63,500	59,700
Single, with children	13,900	7,900	10,000	9,800	16,400	16,100	13,500
Couple, no children	5,900	6,400	7,800	8,700	7,200	8,100	4,700
Couple, with children	7,300	5,200	4,700	5,100	7,200	7,600	6,100
Total potential recipients	71,300	65,700	76,100	82,500	88,800	95,300	84,000
Actual recipients (Danmarks Statistik)	115,438	122,560	135,541	148,094	162,398	173,297	173,297
Take-up rate (%)	62	65	64	64	65	65	67
Housing benefit for pensioners (tenants)							
Potential recipients							
Single persons	45,800	39,300	36,200	34,800	34,600	33,400	38,800
Couples	10,500	9,700	8,000	8,800	9,500	10,700	10,700
Total potential recipients	56,300	49,100	44,200	43,600	44,000	44,100	49,500
Actual recipients (Danmarks Statistik)	230,147	240,680	248,888	255,716	265,908	275,231	275,231
Take-up rate (%)	80	83	85	85	86	86	85

Note: In the column headed '1992 cross-section', the results are given for the cross-sectional data set of 1992

Sources: Own calculations based on extracts from registers at Danmarks Statistik, and various editions of *Statistik Årbog* (Statistics Year Book).

In terms of family type, potential recipients of housing benefit for non-pensioners are mainly single persons without children. This result is very much in line with earlier calculations based on the Ministry of Economic Affairs' Law Model, and must be viewed in the light of the fact that this group can, in fact, only claim a small amount of money in housing benefit (see Chapter 2). Potential recipients of housing benefit for pensioners are also usually single, but the limits placed on the claims of recipients of housing benefit for non-pensioners do not apply to single recipients of housing benefit for pensioners who are without children.

For recipients of housing benefit for pensioners, there was a fall in the number of potential recipients from 56,300 in 1987 to 49,500 in 1992, while the number of actual recipients increased from 230,147 to 275,231 in the same period. This resulted in an increase in the take-up rate for housing benefit for pensioners from 80% in 1987 to 85% in 1992.²

In the longitudinal data material the number of potential recipients of housing benefit for pensioners gradually becomes increasingly underestimated, with the result that the increase in take-up rate is slightly overestimated.

All in all, it appears that the take-up rate increased in the period 1987-1992 for both housing benefit schemes. The rate of change was not, however, evenly distributed over the period; from 1987 to 1988 in particular there was a marked increase in the take-up rate, again for both forms of housing benefit. Part of the explanation for this may be found in the steep rise in relevant rates which took place between 1986 and 1987. The ceiling for how much one could receive in housing benefit for non-pensioners rose by 14% over this period, whereas the increase from 1987 to 1988 was only 4%. Other relevant rates rose by similar amounts; these included the maximum level of rent which could be included for housing benefit for non-pensioners. These increases in rates could have led to a greater number of people becoming entitled to housing benefit of both types in 1987.

In general, it seems that there was usually a certain amount of delay in the claims process, so that a proportion of newly-entitled recipients did not actually begin to receive benefit until the year after that in which they became entitled to it (see Chapter 4). An extra influx in 1987 of newly-entitled recipients could therefore have resulted in a temporary increase in the number of potential recipients and a correspondingly lower take-up rate for that year.

An attempt has also been made to make calculations for the number of potential recipients of housing benefit for pensioners among owner-occupiers and shareholders in co-operative housing associations. However, a particularly high degree of uncertainty is associated with these calculations. For members of housing associations, this is the result of the fact that information on rents for this group was not collected in connection with the general property valuation of 1991. In the case of owner-occupiers, the uncertainty stems mainly from the nature of information about income for the early part of the period. Calculations based on the housing benefit model do however suggest that the number of po-

² Because of differences in the data foundation and the construction of the models, these results are not totally comparable with the take-up calculations made by the Ministry of Economic Affairs and referred to in Chapter 2; however, the trends in the two sets of figures are in the same direction.

tential recipients of housing benefit for pensioners among shareholders in co-operative housing associations was almost 4,000 in 1987, equivalent to a take-up rate of 90%. In 1992 the number of potential recipients of housing benefit for pensioners among owner occupiers is estimated at 25,000, which means that for this group the take-up rate was a little over 20%. It should be noted that these calculations only cover benefits in the form of non-repayable grants; benefits given in the form of loans are excluded.

Take-up calculated on the basis of amount of benefit paid

Table 3.2 shows the take-up rate calculated on the basis of amount of benefit paid. It indicates what proportion the benefit paid to actual recipients represents of the total sum that would have been paid out if all potential recipients had also claimed.

In general terms, the *change* in take-up rate calculated in terms of the amounts paid out does not differ dramatically from that calculated in terms of the numbers of recipients. Nor was it expected to do so, since the total amount of benefit paid out is closely associated with the number of recipients. In line with expectations, the take-up rate for housing benefit for pensioners is higher than that for housing benefit for non-pensioners, and the take-up rate for both groups rises during the period 1987-1992.

However, comparison of Tables 3.1. and 3.2 shows that *the take-up rate* for both types of housing benefit is higher when calculated on the basis of amount than when calculated on the basis of numbers of recipients. This result is in complete accord with previous Danish and international research, and it shows that those families who do actually claim housing benefit are on average entitled to higher levels of benefit than are potential recipients (see Craig, 1991).

Even though there are more potential recipients of housing benefit for non-pensioners than of housing benefit for pensioners, the total amount payable to potential recipients of housing benefit for non-pensioners is lower than for housing benefit for pensioners. This is because potential recipients of housing benefit for non-pensioners are on average entitled to smaller amounts of benefit than potential recipients of housing benefit for pensioners. Thus, potential recipients of housing benefit for non-pensioners were each entitled to just over DKK 5,000 per annum in 1992, compared with a figure of over DKK 10,000 for potential recipients of housing benefit for pensioners. The lowest amounts were for single people without children, who were on average entitled to around DKK 3,000. One of the most important reasons for this difference was that, as already noted, recipients of housing benefit for non-pensioners without children cannot claim benefit equivalent to more than 15% of their total rent costs, which means that housing benefit for this group is in practice very limited. This rule does not ap-

ply, however, to pensioners and recipients of housing benefit for non-pensioners who have children.

Table 3.2 Take-up rate calculated in terms of amount of benefit payable. Calculations are for the month of December in each year. Loans are excluded.

	1987	1988	1989	1990	1991	1992	1992 cross- section
-----DKK millions -----							
Housing benefit for non-pensioners							
Potential recipients							
Single, no children	9.3	10.3	13.3	15.1	15.1	16.7	15.3
Single, with children	10.3	6.4	7.6	8.7	16.1	16.9	13.3
Couple, no children	1.5	1.9	2.5	2.9	2.5	2.7	1.5
Couple, with children	5.0	3.9	3.6	3.6	5.8	6.4	5.4
Total potential recipients	26.1	22.5	27.0	30.3	39.5	42.7	35.5
Actual recipients (Danmarks Statistik)	84.2	93.6	111.0	126.1	141.1	152.8	152.8
Take-up rate (%)	76	81	80	81	78	78	81
Housing benefit for pensioners (tenants)							
Potential recipients							
Single persons	31.0	28.2	28.3	29.1	29.8	29.1	35.5
Couples	6.2	5.9	5.6	6.1	7.1	8.0	7.2
Total of potential recipients	37.2	34.1	33.8	35.2	36.9	37.2	42.7
Actual recipients (Danmarks Statistik)	235.0	262.9	295.8	328.3	365.3	398.4	398.4
Take-up rate, tenants (%)	86	89	90	90	91	91	90

Note: In the column headed '1992 cross-section', the results are given for the cross-sectional data set of 1992

Sources: Own calculations based on extracts from registers at Danmarks Statistik, and various editions of *Statistik Årbog* (Statistics Year Book).

Table 3.2 also shows the consequences for the level of claims on public funds if all potential recipients were to receive housing benefit. Since the amounts shown in the table are for one month only, the figures given, i.e. DKK 35.5 million and DKK 42.7 million for the two types of housing benefit for 1992, must be

multiplied by twelve to obtain the total annual cost.³ Thus, in 1992 the additional claims on public funds would have amounted to DKK 426 million and DKK 512 million for housing benefit for pensioners and non-pensioners respectively, or nearly DKK 1 billion in total, if the potential recipients had claimed their entitlement. The total expenditure on housing benefit for that year of DKK 6.8 billion would, in other words, have been 14% higher.

3.2 The characteristics of potential and actual recipients

There are a number of studies concerned with the phenomenon of take-up which attempt to explain the reasons for failure to claim entitlement (see the overview in Craig, 1991).

Most of the explanations are either based on potential recipients not being aware of their entitlement, or on the costs of claiming benefit outweighing the value of any entitlement. The costs referred to in this context are partly economic costs, including the value of the time spent in making a claim, and partly personal, in that some potential recipients might feel a degree of shame in accepting help from the authorities.

The role of the costs of claiming is discussed in an article by Blundell *et al.* (1988), which deals with housing benefit in the United Kingdom. A model is presented in this article which describes the choice between claiming and not claiming housing benefit as a function of the amount of benefit, plus a number of other factors which are thought to be significant in determining the size of the costs involved in making a claim.

Drawing heavily on this analysis as inspiration, we will next examine the factors which can be expected to have an influence on take-up in the context of the Danish housing benefit regulations, and to determine which of these factors are characteristic of actual and potential housing benefit recipients. In addition to factors which affect the costs to families of claiming benefit, we will also consider factors which affect their opportunities of discovering whether they are entitled to benefit.

A fully satisfactory analysis requires that register data is used in conjunction with other information about the families involved. This information will first become available at a later stage of the research project of which this study

³ The number of claimants of housing benefit for non-pensioners is normally highest in December. As a result of using the figures for this month as a basis for calculations, the take-up rate found is, all other things being equal, likely to be a little higher than if calculations were based on the average number of recipients. The potential additional amount that could be claimed would thus be correspondingly a little lower. However, this difference does not significantly affect the reasoning.

forms a part. Nevertheless, an analysis of the register data available already does permit a number of provisional conclusions to be drawn.

The analyses are made for those families which, according to the calculations made using the housing benefit model, were entitled to housing benefit. An equivalent group was chosen for analysis in the United Kingdom study. Since housing benefit calculations are more susceptible to uncertainty when concerned with those families for whom information on rent levels is lacking and has to be imputed, such families have been excluded from this analysis. However, analyses were made for these families on a trial basis, and it was found that in any case their inclusion made no significant difference to the results.

Furthermore, it was decided to focus only on single persons, since a number of the characteristics to be included in the analysis were applicable only to single persons, and were not necessarily representative of the whole family. Examples of such factors are gender, age, and occupation. The calculations were made on the basis of the 1987 data set and the cross-sectional data set for 1992, both of which data sets were based on a representative sample of Danish families for the years in which they were drawn.

The probability that a given family who is entitled to housing benefit will be actual recipients of that benefit is determined in this analysis on the basis of a number of characteristics. An attempt has been made to determine the distribution of probability on the basis of a logistic regression model, in which the response variable is binary and has the values:

- 1, if the family receives housing benefit
- 0, if the family does not receive housing benefit.

Housing benefit for non-pensioners

For families entitled to housing benefit, attempts were made to explain the probability of their claiming it according to the amount of benefit to which they would be entitled, the total family income, the age of the individual, their gender, their occupation, the type of housing, their labour market status, and the number of children in the family.

First, the model was used to attempt to estimate the probability for the years 1987 and 1992 separately. The results of this analysis are shown in Appendix 5. As can be seen from these results, the estimates for the two years were very much in agreement for recipients of both types of housing benefit. Since the significance of the various characteristics appeared to be the same for the two years, the model was then used to make estimates on the basis of the combined data material for the two years. The only difference was that a variable was then included for whether the data were from 1987 or 1992.

For technical reasons, Danmarks Statistik decided to combine the occupational groups ‘Students/school pupils’ and ‘others without occupation’ under the variable ‘without occupation’ in the year 1992. Since this grouping actually is of relevance for an interesting point in the analysis, a special analysis was made for recipients of housing benefit for non-pensioners for 1987 with the original occupational grouping.

The results of the estimates for those entitled to housing benefit for non-pensioners can be seen in Table 3.3. It can be seen from the combined results for 1987 and 1992 that the great majority of the characteristics listed above appear to be significant for receipt of housing benefit for non-pensioners. Only the variable for the data source year can be excluded if the explanatory power of the model is tested at a significance level of 5% as compared with an alternative where the variable in question is excluded. The fact that the source year for the data is not found to be significant can be taken as evidence that, as expected, the estimates have not altered systematically from 1987 to 1992.

The significance of the individual parameters can be illustrated using the characteristic *gender*, where the basis for the variable is that the single person is a woman. If the person is a man, the parameter value is -0.2896. The probability that a woman will receive housing benefit, given that other characteristics⁴ (*i*) remain constant, is thus:

$$p(1|i_1, \dots, i_n) = \frac{\exp(b_0 + b_1 i_1 + \dots + b_n i_n)}{1 + \exp(b_0 + b_1 i_1 + \dots + b_n i_n)} = \frac{0.7638}{1 + 0.7638} = 0.4330$$

For a man with the equivalent characteristics, the probability $p = 0.3638$, which means that the relative probability that a woman will receive housing benefit in comparison with a man is $0.4330/0.3638 = 1.1904$; in other words, the probability that, all other things being equal, a woman will receive housing benefit is around 1.2 times greater than the probability that a man will.

Table 3.3 Probability of receiving housing benefit for non-pensioners for those entitled to it¹

	1987 and 1992 ²⁾	1987 ²⁾
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⁴ The example is based on the case of a woman with the following realistic characteristics: housing benefit received DKK 6,000 p.a., annual income DKK 150,000, age 36 years, 1 child, unskilled, not a resident in a publicly-owned housing association, dwelling floor area 80m², no income support payments, supplementary pension scheme contributions paid in full (all information being for 1992).

	Estimated		Estimated	
Constant	-1.2698*	(0.2285)	-1.2406*	(0.3577)
Log (calculated housing benefit)	0.9560*	(0.0514)	0.9551*	(0.0781)
Income, in DKK 1,000	0.0043*	(0.0009)	0.0033*	(0.0016)
Age	0.0155*	(0.0026)	0.0197*	(0.0045)
Gender:				
Man (0/1)	-0.2896*	(0.0699)	-0.2590*	(0.1130)
Number of children	0.2525*	(0.0563)	0.3454*	(0.0811)
Occupation:				
Senior management	0.2017	(0.2706)	0.5805	(0.4402)
Other management	1.0227*	(0.1774)	1.3020*	(0.2735)
Skilled	0.7629*	(0.2143)	0.4708	(0.3536)
Unskilled	0.8702*	(0.1764)	0.9625*	(0.2704)
Other employed	0.7522*	(0.2064)	0.9907*	(0.3320)
No employment category	1.1499*	(0.1706)	.	
Students/school pupils	.		1.7831*	(0.3039)
Other without employment category	.		1.1628*	(0.2673)
Dwelling:				
Publicly-owned housing assoc. (0/1)	-0.5369*	(0.0653)	-0.5321*	(0.1034)
Floor space, m ²	-0.0173*	(0.0001)	-0.0209*	(0.0024)
No income support (0/1)	-0.2659*	(0.0014)	-0.4436*	(0.1295)
Sup. pension fund contributions paid	-0.3437*	(0.1017)	-0.2328	(0.1965)
Year 1987 (0/1)	-0.0334	(0.6003)	.	
Log likelihood	-3,518		-1,441	
Number of observations	6,378		2,623	

Notes: 1) The response variable has the value 1 if housing benefit for non-pensioners is received, otherwise it is 0

2) An asterisk indicates that the variable is significant at the 5% level for an χ^2 test.

Figures in parentheses indicate the standard deviation.

Source: Own calculations on the basis of extracts from data registers from Danmarks Statistik

It may generally be assumed that the more housing benefit to which a family is entitled, the greater the probability that the family will actually claim the benefit. Tables 3.1 and 3.2 suggest that this is also true. This point can also be seen from the parameter value for the logarithm for entitlement to housing benefit for non-pensioners per DKK 1,000, which is significantly positive in Table 3.3 This means that the probability of receiving housing benefit for non-pensioners increases with the size of the amount to which the claimant is entitled.

These results appear to reflect the fact that non-take-up is to some extent the expression of a choice, or of the fact that those who are entitled to larger amounts are more often aware of their entitlement. If this were not so, there would be a random distribution of take-up among those who were entitled to

housing benefit for non-pensioners, and there would be no systematic deviations between housing benefit paid to actual and potential recipients.

The families with the lowest incomes may be assumed, all other things being equal, to derive the greatest benefit from an increase in income in the form of housing benefit; this would point towards the probability of receiving housing benefit falling with a rise in income. This effect might be further strengthened by families who were better able to support themselves financially having greater moral doubts about accepting benefit payments than others, with the result that the 'costs' of claiming benefit would be higher.

However, the opposite trend would result from the fact that among the families with higher occupational status there are likely to be a larger number of well-educated persons, who presumably will find it easier to understand the regulations relating to housing benefit, and will consequently find it easier to make a claim.

In the analysis, income is reckoned as gross income minus rent costs, calculated per DKK 1,000. In this context it should be noted that sources of income which are not included in normal taxation of income are not counted, nor do they form part of the model. Such sources of income are, for example, in addition to housing benefit, a number of income supplements paid to pensioners, most capital gains, and various other social security payments.

The estimates show that, all other things being equal, the higher the gross income, the more likely it is that housing benefit will be claimed. This was true for both 1987 and 1992.

Age is often assumed to correlate negatively with the probability of receiving benefit. This assumption is based on the idea that the older generation has been accustomed to a more limited welfare state structure than that which exists today. For this reason they are perhaps not so quick to claim their legal entitlements. However, this argument can only apply to a limited extent to non-pensioners, who in the nature of things are not so old. Nevertheless, in the actual estimates for recipients of housing benefit for non-pensioners, the coefficient for the claimant's age was found to be positive. In other words, it is more probable that an older person will receive housing benefit for non-pensioners than a younger person, all other things being equal. This may be connected with the fact that a drop in income has fewer consequences for a younger person than for older, more well-established groups, who must supplement their income more quickly, for example by obtaining housing benefit.

The number of children in the family may be expected to increase the probability of housing benefit being claimed, since providing for children living at home

increases the need for a secure income. The number of children also plays a significant role in the model. Thus the probability that housing benefit for non-pensioners will be received increases with the number of children.

For non-pensioners, occupation can also be of importance. Occupational category can be an indicator of both educational level, where it can be assumed that better-educated people will find the benefit claim process easier to deal with, and of a person's attitude towards receiving welfare benefits. Both these factors will be reflected in the costs of claiming benefit. In the logistic regression, occupation is therefore included as a categorised variable. The base value used for the estimates is the self-employed.

The estimates show that the probability for receiving housing benefit is significantly lower for the self-employed than for all other occupational groups except senior management. This finding is in accordance with earlier survey-based research, which has shown the self-employed to be more reticent as regards social welfare benefits than other occupational categories (Friedberg, 1988). The groups which, in comparison with the self-employed, seem most disposed to accept the housing benefit to which they are entitled are the 'no employment category' and 'other management' categories, while the 'skilled' and 'other employed' groups are less distinctive in this respect.

In 1987, the year in which it is possible to distinguish between students and others without occupational category, it can be seen that it is to a large extent the students who received the housing benefit to which they are entitled. This may be because students find it relatively easy to comprehend the housing benefit regulations, and because they are members of a group in which many people are entitled to housing benefit, so that knowledge of how to obtain it spreads rapidly within the group. It may also be relevant that many students receive student maintenance grants, and are therefore used to completing benefit application forms in order to obtain the funds necessary to cover their living costs.

Type of accommodation may also be of significance for the utilisation of the housing benefit system, since people living in publicly-owned housing associations are often in a good position to obtain information about the possibilities that exist for claiming housing benefit, for example through leaflets or articles in association newsletters. This is not to suggest that such information would be disseminated in the form of individual advice or a special assessment of an individual

The National Association of Housing Associations, which represents the interests of publicly-owned housing associations, issues leaflets which detail the possibilities for claiming housing benefits. The residents of publicly-owned housing associations are among those likely to be able to benefit from this information.

family's entitlement to support, but would simply consist of the information that the possibility of seeking housing benefit did exist.

As can be seen from the estimates, such information would seem to be important, since the probability of receiving housing benefit is significantly higher for families living in publicly-owned housing associations than for others.

Families living in relatively large homes may be expected to have a lower level of probability of applying for housing benefit. The floor area of the dwelling is in itself significant in determining the amount of benefit payable, but since this factor is included in the calculations through a special variable, the effect should already have been explained. What is more important is that families living in large dwellings automatically assume that they will not be entitled to housing benefit, and therefore do not apply. This effect also appears to be visible in the results of the estimates, which show the probability of receiving housing benefit falling as the floor area of the dwelling increases.

All other things being equal, those who receive income support may be expected to have a greater probability of receiving housing benefit than others, for in these cases there is already contact with the welfare authorities, who can help a family to apply for housing benefit. In the logistic regression this factor is represented by a dummy variable which indicates whether or not such welfare benefits are being paid to the family. The results of the estimates confirm these expectations; the estimates are lower for non-recipients of welfare benefits than for those who do receive them.

Supplementary pension fund contributions (which are deducted compulsorily from the wages of earners) are used in the model for non-pensioners as an approximation of the closeness of the relationship to the labour market. The variable is continuous and is set up so that a value of one is equivalent to a full-time yearly number of working hours, whereas a value of zero indicates no hours worked during the year. In calculating this variable, account has been taken of the fact that supplementary pension fund contributions are not the same for state employees and employees in the private sector. The more hours one works, the less free time there is available to use to claim housing benefit. The actual estimates reflect this, since the probability of receiving housing benefit falls as the number of hours worked increases.

Housing benefit for pensioners

Table 3.4 shows an equivalent model for pensioners' entitlement to housing benefit. A number of the explanatory variables used before are related to the labour market, and therefore cannot be used for pensioners and are not taken into account in this model for housing benefit. These variables include occupation and amount of supplementary pension fund contributions paid. Nor is the

number of children in the family used as a variable, since this is not relevant for pensioners except in the case of single persons who have taken early retirement.

Table 3.4 Probability of receiving housing benefit for pensioners as a tenant, for those entitled to it.¹

1987 and 1992		
	Estimate	
Constant	2.3494*	(0.2438)
Log (calculated housing benefit)	1.0359*	(0.0411)
Income	-0.0110*	(0.0011)
Age	-0.0136*	(0.0023)
Gender:		
Man (0/1)	-0.3798*	(0.0691)
Housing:		
Publicly-owned housing association	-0.2454*	(0.0645)
Floor area in square metres	-0.0121*	(0.0014)
Year 1987 (0/1)	-0.0123	(0.0688)
Log Likelihood	-3,922	
Number of observations	11,014	

Notes: 1) The response variable has the value 1 if housing benefit for pensioners is received, otherwise it is 0

2) An asterisk indicates that the variable is significant at the 5% level for an χ^2 test.

Figures in parentheses indicate the standard deviation.

Source: Own calculations on the basis of extracts from data registers from Danmarks Statistik

It can be seen from Table 3.4 that the probability of being in receipt of housing benefit for pensioners increases with the amount of support to which claimants are entitled. It has been demonstrated earlier in this chapter that the same is true for housing benefit for non-pensioners. The size of the amount of benefit is thus of importance for recipients of both types of housing benefit. This suggests that people receiving housing benefit are to some extent characterised by having estimated how much they will be able to receive, and whether it is worth the trouble of applying.

In contrast to the situation for recipients of housing benefit for non-pensioners, the level of income is seen to have a negative effect on the likelihood of receiving housing benefit for pensioners. Perhaps the reason for this lies in income as an approximation of level of education now being overshadowed in its effect by the argument that the least well-heeled have the greatest need for an increase in income, and that wealthier pensioners will to a greater extent dispense with housing benefit if they can manage without it. It may thus be deduced that level of income is not unambiguously linked to the probability of receiving housing benefit.

The estimate for the significance of age has also changed its sign, in that the probability of receiving housing benefit for pensioners declines with advancing age. This can be seen as an expression of the fact that younger pensioners, including those on early retirement schemes, are the ones who take most advantage of their opportunities to claim housing benefit. As expected, it is the oldest pensioners who are least likely to receive housing benefit. This may tie in with the expectation that there will be reticence among the oldest to claim public benefits, but may also be due to the fact that as one gets older, it may be harder to understand the opportunities that exist for claiming housing benefit. A reasonable hypothesis could therefore be that the significance of age for receiving housing benefit actually fits an inverted u-shaped curve, with likelihood of receiving benefit being least for the youngest and oldest and greatest for those of middle age.

Table 3.4 shows that female pensioners are more likely than their male counterparts to receive the housing benefit to which they are entitled. This accords with the results for recipients of housing benefit for non-pensioners.

Similarly, it can be seen that residents in publicly-owned housing associations have an increased likelihood of receiving housing benefit in comparison with residents in other types of dwelling, and that this applies for both pensioners and non-pensioners. The size of the dwelling also appears to have a negative effect on the likelihood of pensioners claiming housing benefit.

3.3 Summary

The new take-up calculations show an increasing take-up rate for the period from 62% in 1987 to 67% in 1992 for those entitled to housing benefit for non-pensioners, and from 80% to 85% for those entitled to housing benefit for pensioners.

Even though the number of potential recipients of housing benefit for non-pensioners increased during the period, the number of actual recipients increased at an even faster rate. The number of potential recipients of housing benefit for pensioners fell during the period, and in combination with a rise in the number of actual recipients this also resulted in an increased take-up rate.

Despite the increased take-up rate, a very substantial amount of money was not paid out from public funds in 1992 as a result of the fact that not all those entitled to claim housing benefit did in fact do so. The amount saved was almost DKK 1 billion in total. The total expenditure on housing benefit for that year of DKK 6.8 billion would, in other words, have been 14% higher if all those entitled to benefit had received it.

The literature available concerning take-up suggests a number of common explanations for the phenomenon. When some families who are entitled to benefit do not receive it, this may be because they are unaware of the existence of the benefit and their entitlement, or because the amount they can receive in benefit would not be sufficiently large to compensate for the trouble it would take to claim it. Following the pattern of a British research study, an investigation was made into which characteristics appear to be significant in determining whether families receive the benefits to which they are entitled, and to what degree these characteristics can be related to the explanations mentioned above.

The analyses show that the likelihood of receiving housing benefit increases with the size of the amount of the entitlement. This must be taken as confirmation, to some extent, of the assertion that in claiming housing benefit there is a trade-off between the amount that can be obtained and the difficulty involved in claiming it. Such 'difficulty' can be of a moral nature, in that some wish to manage for themselves; this may particularly be the case for the self-employed.

Alternatively, the difficulty in claiming may be connected with the time required to make the claim. There are not many people who enjoy spending their leisure time filling in forms. Those for whom leisure is in short supply are likely to feel especially resentful of having to spend it in such a way.

This picture of there being a weighing-up of what is and is not worth doing where claiming benefit is concerned is confirmed for recipients of housing benefit for non-pensioners by the finding that the more hours a person has been employed on the labour market for the year in question, the less likely it is that such a person will have received housing benefit, since they have had less time available to invest in claiming social security benefits. In addition, some will be quicker than others to understand the rules of the game. This may be the reason why students in particular, who are used to claiming student maintenance grants, appear to be particularly likely to be in receipt of the housing benefit to which they are entitled. Another reason for this may be that within this relatively homogenous group there are many who will be entitled to housing benefit for non-pensioners, and this increases awareness of the existence of this benefit. Information about housing benefit may also be distributed by those who work in the field of social security. It may be that this source of information is important in the case of the recipients of other social security benefits, if their case officers are knowledgeable concerning the relevant legislation. Similarly, publicly-owned housing associations can make residents aware of the existence of housing benefit.

To these observations based on cross-sectional data should now be added the results obtained from examining longitudinal data. These dynamic analyses form the subject of the next chapter.

4. Dynamic aspects of housing benefit

The previous chapter described a consistent time series of data for take-up of housing benefit. Another and most crucial aspect of housing benefit studies is movement of people in to and out of the housing benefit system and also into and out of the group of potential recipients of housing benefit. The period of time for which benefits are received can be critical for the take-up rate, as described in Chapter 1; for this reason, investigations are described in this chapter of how long *actual* recipients remain in the housing benefit system. As far as *potential* recipients are concerned, research results are presented on the number of families who sooner or later do become actual recipients of housing benefit. This information contributes to an understanding of the degree to which non-take-up is a result of delays in the process of claiming benefit, as discussed in Chapter 1.

In the longitudinal data material, a number of families were monitored over the period 1987-1992. The membership of each of the families could change over this period. Consequently, people who left the original families, or who joined the original families, were also included in the study.

This chapter describes the dynamic aspects of housing benefit, first for the actual recipients and then for the potential recipients of such benefit.

4.1 Actual recipients of housing benefit

The description of actual recipients of housing benefit is based on those families who were in receipt of housing benefit in the month of December, according to the housing benefit register.

First, it will be helpful to make clear how a family is defined, and how great an alteration in the composition of a family can take place before it is regarded as having ceased to exist in terms of this study.

The family is defined here as one or more adults who live at the same address and are either a single person, a married couple, a cohabiting couple with children from the relationship, or a cohabiting couple. The children of the adults living at home are regarded as members of the family if they are unmarried and do not themselves have children living at home; no limit is placed on the age of children defined as members of the family.

When an individual family is monitored over time, this is done (in accordance with standard practice for Danmarks Statistik) by allocating the family a number. For couples, this number is the civil registration number of the woman, and for other families it is that of the oldest family member. If a married couple separate, the woman will thus continue to be associated with the original family

number, while the man will have a new family number. If a young person leaves home, the parents will still be regarded as belonging to the original family, while the 'child' will become a member of a new family. A more detailed discussion of the concept of the family and alterations to the family is presented in Appendix 2.

Now let us consider more closely the families in the longitudinal data set who received housing benefit. As mentioned earlier, there are two types of housing benefit, one paid to *non-pensioner* families who are tenants, and one available only to *pensioner* families, regardless of whether they are tenants, owner-occupiers, or shareholders in a co-operative housing association.

Table 4.1 shows the number of families in the longitudinal data set who were in receipt of housing benefit in the month of December in any given year.

Table 4.1 Families in the sample in receipt of housing benefit

	1987	1988	1989	1990	1991	1992
Housing benefit for non-pensioners						
Tenants	3,300	3,865	4,520	5,159	5,976	6,609
Multiple recipients	30	50	43	54	75	82
Total	3,330	3,915	4,563	5,213	6,051	6,691
Recipients of housing benefit for pensioners						
Tenants	6,674	7,057	7,382	7,762	8,276	8,688
Shareholders in housing assoc.	333	394	439	482	549	633
Owner-occupiers	200	225	218	223	221	209
Multiple recipients	9	7	23	14	15	17
Total	7,216	7,683	8,062	8,481	9,061	9,547

Source: Own calculations based on data in registers at Danmarks Statistik.

In the sample group there were 3,330 families in receipt of housing benefit for non-pensioners and 7,216 families receiving housing benefit for pensioners in 1987. The great majority of recipients of housing benefit were tenants. In fact, around 93% of families receiving housing benefit for pensioners in 1987 were tenants, while only 5% were shareholders in co-operative housing associations and 3% were owner-occupiers. By 1992 these proportions had changed only marginally, with 92% of families receiving housing benefit being tenants, 6.5% shareholders in co-operative housing associations and 2.5% owner-occupiers.

The numbers of families receiving housing benefit shown in Table 4.1 are based on the longitudinal data set which for 1987 consisted of a 3% representative sample of Danish families. When the number of families is grossed up to a figure representing the entire population of Denmark for the year in question, it is found that the number of families calculated as being in receipt of housing benefit is a little lower than the actual number of recipients according to Danmarks Statistik (see also Table 3.1 in the previous chapter). This is because Danmarks Statistik regards the number of housing benefit recipients as the sum of the number of *people* who were recorded in the housing benefit register as being recipients. Table 4.1, however, is based on information concerning the families as at January 1st in the family/household register. The number of these *families* who received housing benefit in December was then checked. Thus there are in the data set some families where several people in the family received housing benefit in December. Closer examination of the data reveals that this is because the composition of the families had changed in the course of the year. These families are termed 'multiple recipients' in Table 4.1. As can be seen from the table, the problem is in practice a negligible one, since it affects only a small number of families.

Entry into and exit from the housing benefit system: actual recipients

Entry into and exit from the housing benefit schemes was investigated by the Ministry of Housing and Building for the period between December 1986 and December 1987 (Boligministeriet, 1990b). One of the conclusions based on this analysis was that around one tenth of recipients of housing benefit for pensioners and one third of recipients of housing benefit for non-pensioners stopped receiving benefit during those particular twelve months.

A corresponding analysis using the current data material has been made for the period 1987-1991, and the results are shown in Table 4.2. The starting point for each year's analysis was all those families who in December of that year were in receipt of housing benefit. Then a check was made on whether these families were still receiving housing benefit in the December of the following year. The category 'Remained' denotes all families who remained in the system and were still in receipt of housing benefit in the following year, while those designated 'Left' did not receive housing benefit in December of the following year.

It can be seen from the table that these new results are to a large extent in accord with the figures from the Ministry of Housing and Building. Thus, around 66% of those receiving housing benefit for non-pensioners in 1987 were still receiving it in 1988. The corresponding proportions were almost unchanged for each year through to 1991, which was the last year for which calculations could be made from the data available. For housing benefit for pensioners, around 91% of the recipients in any given year were still recipients in the following year.

Table 4.2 Changes in the housing benefit recipients sub-group from the sample

	1987	1988	1989	1990	1991
Housing benefit for non-pensioners	----- % -----				
Remained	66.4	66.1	65.0	65.2	64.1
Left	33.6	33.9	35.0	34.8	35.9
Total	100.0	100.0	100.0	100.0	100.0
Total number	3,330	3,915	4,563	5,213	6,051
Housing benefit for pensioners	----- % -----				
Remained	90.8	90.1	90.6	91.2	90.9
Left	9.2	9.9	9.4	8.8	9.1
Total	100.0	100.0	100.0	100.0	100.0
Total number	7,216	7,683	8,062	8,481	9,061

Source: Own calculations based on data in registers at Danmarks Statistik.

The drop-out rate for recipients of housing benefit for pensioners is thus much lower than for housing benefit for non-pensioners, and this point is discussed further below.

What is not shown by the above analysis is the length of time for which families who leave the housing benefit system have been in receipt of such benefit. An indication of this can be obtained by dividing benefit recipients into two groups, namely 'new recipients', who only started receiving benefit during the year in question, and 'old recipients', who have been in receipt of benefit for a longer period. Since the data set begins in 1987, the division into two such groups cannot be made for that year, and so this analysis is limited to the period 1988 to 1991.

Table 4.3, like Table 4.2, divides housing benefit recipients for a given year into those who continue to be in receipt of housing benefit in the following year, and those who do not; but at the same time it also shows whether these families were in receipt of housing benefit in the year before the given year in question. The families who also received housing benefit in the previous year are called 'old' recipients, and those who did not are 'new'. The category 'remained' continues to denote those families who continued to receive benefit the following year, while those categorised as 'left' ceased to receive benefit.

The table shows that a larger proportion of new recipients of housing benefit than old recipients left the system in the year following that analysed. This applies in the cases of housing benefit for both pensioners and non-pensioners, and the proportions remain relatively stable over time. Thus, around 46% of new recipients of housing benefit for non-pensioners stopped receiving benefit the

year after, while the corresponding proportion of old recipients was only around 27%. For recipients of housing benefit for pensioners, the proportion of new recipients leaving the system the year after was just under 15%, but the proportion of old recipients was only around 8%.

Table 4.3 Changes in the housing benefit recipient sub-group in the sample, shown with recipients grouped as 'new' and 'old' recipients.

With recipients grouped as 'new' and 'old' recipients.								
	1988		1989		1990		1991	
	----- % -----				----- % -----			
Housing benefit for non-pensioners	Old	New	Old	New	Old	New	Old	New
Remained	74.6	55.14	73.3	54.0	73.6	54.2	71.7	54.2
Left	25.4	44.9	26.7	46.0	26.4	45.8	28.3	45.8
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Total number	2,212	1,703	2,588	1,975	2,964	2,249	3,401	2,650
	----- % -----				----- % -----			
Housing benefit for pensioners	Old	New	Old	New	Old	New	Old	New
Remained	91.0	85.3	91.4	85.8	92.2	85.5	92.1	83.9
Left	9.0	14.8	8.6	14.3	7.9	14.5	8.0	16.1
Total	100.0	100.1	100.0	100.1	100.1	100.0	100.1	100.0
Total number	6,551	1,132	6,925	1,137	7,302	1,179	7,737	1,324

An examination of the characteristics of those families who left the housing benefit system during this period shows, predictably enough, that in over 50% of cases where a pensioner family left the system this coincided with one or more family members leaving the family, or with the family ceasing to exist. In the majority of cases these events were the result of one or more family members dying, or perhaps moving into nursing homes.

Among families who left the housing benefit for non-pensioners system the year after entering, the proportion of families which ceased to exist is, again predictably, much lower. However, in around 20% of families there was an alteration in the family composition as compared to the previous year. It was also a typical event for this group that a number of the recipients enjoyed a significant increase in income, which could be a reason for their no longer receiving housing benefit.

If on the other hand we examine the characteristics of the families who *began* to receive housing benefit for non-pensioners, we find that around 30% of these family units were newly-formed since the previous year. These cases may have been of young people who had left home, or men who had ceased to be members of couples and now lived alone. In addition, over 10% of families who began to receive housing benefit for non-pensioners were already potential recipients the year before, i.e. they were previously entitled to receive housing benefit if they had claimed it.

Of the new recipients of housing benefit, around 15% were from family units which did not exist in the previous year. This factor should probably be viewed in the context of the definition of the family used, which means that a man whose wife dies will be recorded as a new family. Thus, a proportion of these 'new' recipients may also have previously received housing benefit, but in the context of another 'family'. In addition, around 20% of family units in this group appear to have been entitled to receive housing benefit in the previous year, i.e. they were previously potential recipients.

Period of receiving benefit: actual recipients

The data material not only enables the above analysis of entry to and exit from the housing benefit system to be made, but also gives a relatively precise picture of the length of time for which each individual family received housing benefit, as shown in Table 4.4.

The data in the table are for those families who were in receipt of housing benefit in 1992. If a given family did not also receive benefit in December 1991, they are considered to have received benefit for one year. If they also received benefit in 1991, but not in 1990, then they are counted as having received benefit for two years, and so on.

The table shows that around 42% of recipients of housing benefit for non-pensioners received benefit only in 1992, while this was the case for under 14% of recipients of housing benefit for pensioners. At the other end of the scale, we find that 12% of recipients of housing benefit for non-pensioners received benefit for the whole of the period from 1987 to 1992, and thus were in receipt of housing benefit for over 5 years. In the case of housing benefit for pensioners, this was true of almost 50% of the total number of recipients in 1992.

Table 4.4 Number of years for which actual recipients in 1992 had received housing benefit.

No. of years	1	2	3	4	5	Over 5	Total
	----- %-----						Number
Housing benefit for non-pensioners	42.1	21.5	11.8	7.6	5.1	12.0	100 6,691
Housing benefit for pensioners	13.8	11.6	9.6	8.5	7.7	48.8	100 9,547

Source: Own calculations based on data in registers at Danmarks Statistik.

The results shown in Table 4.4 may to some extent be affected by the definition used of the concept of the family. This is such that a person who had in fact received housing benefit for a number of years in succession would only be shown as having done so in the table if the person had remained a member of the same family all through that period. For example, consider the case of a man who had claimed benefit on behalf of a woman and himself, and then the relationship dissolved. If he claimed again, it would be as a member of a different family, and he would then be recorded as a new recipient, despite the fact that he had in fact received housing benefit previously.

In the case of pensioners, family composition may be assumed to be more stable than in the case of non-pensioners. This effect is strengthened by the fact that couple families are identified by the woman. Since the woman often lives longest, this means that for pensioners the family will remain the same for a relatively long period.

One might also imagine that the shorter periods for which recipients of housing benefit for non-pensioners obtained housing benefit might be due to the fact that families did not receive benefit for long continuous periods, but received it over a number of discontinuous periods. A calculation of this has been made for housing benefit recipients in the longitudinal data set. This calculation shows that in fact only a small proportion of recipients of housing benefit for non-pensioners obtained benefit for more than one period, and that this proportion

was only a little higher for recipients of housing benefit for non-pensioners than for recipients of housing benefit for pensioners.

The definition of the concept of the family and breaks in receiving benefit cannot therefore be considered to have had such a major effect on the analysis of the lengths of time for which families received benefit as to have significantly altered the general picture.

The combined picture of the two housing benefit types is thus that housing benefit for non-pensioners is to a large extent and for the great majority of the families who receive it a benefit obtained for a very limited period, whereas this is not the case for housing benefit for pensioners, since nearly 50% of recipients examined here had enjoyed the benefit for more than five years.

In the light of this finding, it will be of interest to discover to what extent families who receive housing benefit for non-pensioners over a long periods differ from the average recipient family.

Long-term recipients of housing benefit

Table 4.5 provides an overview of the average amounts of housing benefit and the most important factors that determine housing benefit, i.e. income, rent and type of family. The overview provided here has been prepared on the basis of data from 1992, and shows the figures for all housing benefit recipient families, and for families who received housing benefit throughout the period 1990-1992.

It should be noted that the income mentioned above is not the total income for the household but the calculated housing benefit income, i.e. the income figure which is used for the allocation of housing benefit. This figure differs from that of the total household income in that, for example, a deduction is made of around DKK 20,000 per child in the household (see Appendix 2). The few families where more than one person receives housing benefit have been excluded from the calculations.

Table 4.5 shows the average housing benefit for non-pensioners received in the month of December 1992 to have been DKK 879 for the 6,609 recipient families in the longitudinal data set. For the 9,530 recipients of housing benefit for pensioners the amount was rather greater: DKK 1,410. As expected, these amounts are very similar to the average levels of housing benefit for non-pensioners and pensioners calculated by Danmarks Statistik for December 1992, which were DKK 882 and DKK 1,399 respectively.⁵

⁵ *Statistiske Efterretninger*, 1993:10

In the case of recipient families of housing benefit for non-pensioners, the average amount is somewhat larger for those families who had received benefit throughout the period 1990-1992.

As mentioned in Chapter 3, it is in general the case that housing benefit for non-pensioners increases with higher rents and falls with higher income. However, the table shows that both rent *and* income are higher for long-term recipients of housing benefit for non-pensioners than for the others.

Table 4.5 Differences in housing benefit according to the period for which it was received

	December 1992	
	All families	Families receiving housing benefit 1990-992
Housing benefit for non-pensioners	----- DKK -----	
Average amount per month	879	1,051
Income	107,749	112,799
Rent per year	34,053	36,734
Family type:	----- % -----	
One adult, no children	40.3	30.0
One adult, with children	36.9	49.6
More than one adult, no children	10.0	5.8
More than one adult, with children	12.8	14.6
Total	100.0	100.0
Total number	6,609	2,381
Housing benefit for pensioners	----- DKK -----	
Average amount per month	1,410	1,409
Income	84,319	81,363
Rent ¹ per year	28,940	28,234
Family type	----- % -----	
Single person	79.3	81.4
Couple	20.7	18.6
Total	100.0	100.0
Total number	9,530	7,099

Note: 1) Information on rents does not cover owner-occupiers and occupants of municipal housing for pensioners.

Source: Own calculations based on data in registers at Danmarks Statistik.

Since income is higher among long-term recipients of housing benefit for non-pensioners, one might expect that the average amount of housing benefit would be lower for this group. This is not the case; but in this context it should be noted that the proportion of families with children is considerably greater for long-term recipients. This group normally receives a higher level of housing

benefit than families without children. As already stated, this is a consequence of the regulations for housing benefit for non-pensioners being much more restrictive for adults without children, in that this group can only receive an amount in benefit equivalent to 15% of their rental costs. In practice, therefore, it is the amount of rent rather than the amount of income that sets the upper limit on the level of housing benefit for these families.

Even though long-term recipients of housing benefit for non-pensioners receive a larger amount on average than other recipients the benefit, payments to these families are considerably lower than those to recipients of housing benefit for pensioners. For recipient pensioner families, one does not find the same large differences in level of housing benefit payments, rent or income between long-term recipients and other recipients. This comparison should, however, be seen in the light of the fact that the great majority of recipients of housing benefit for pensioners also received housing benefit in 1990 and 1991.

The *overall impression* one receives from the above is that housing benefit for non-pensioners is most often received for a very limited period, and that the amount received, especially in the case of families without children, is very limited. Housing benefit for pensioners, on the other hand, is received over a longer period, and is on average considerably larger than the amount given as housing benefit for non-pensioners. The higher amounts received by pensioners are not only a consequence of this group having lower incomes, but also the result of the more favourable housing benefit regulations which apply to them.

4.2 Potential recipients (tenants)

As stated in Chapter 1, dynamic studies of potential housing benefit recipients have not been conducted before in Denmark. There has also been no satisfactory information on how rapidly changes take place in the group of potential recipients, and how many of the families who are potential recipients later become actual recipients. Such information is clearly central to the entire discussion of the problem of take-up (see Chapter 1). It was suggested in Chapter 1 that delays in applying for benefit might be one of the reasons for failure to take up benefit entitlements. Just how great a role this reason plays will be explored on an empirical basis in this section.

The analyses are based on those families identified as potential housing benefit recipients using the housing benefit model. The identification of potential recipients involves considerable uncertainty in the cases of shareholders in co-operative housing associations and owner-occupiers, and consequently the analyses are based on tenants only. In the case of recipients of housing benefit for non-pensioners this does not mean any reduction in the number of potential recipients, since housing benefit for non-pensioners is only available to tenants. In the case of pensioners, where housing benefit can also be given to sharehold-

ers in co-operative housing associations and owner-occupiers, this exclusion does lead to a certain reduction in the number of potential recipients. However, there are in fact very few shareholders in co-operative housing associations who are potential recipients of housing benefit for pensioners (see Chapter 3), and removing them from the calculations can be assumed to have only very little effect on the results.

Chapter 3 gives the total number of potential recipients of housing benefit, calculated for the whole of Denmark. The following examines families (tenants only) in the longitudinal data material and describes their entry into, remaining in and exit from the group of potential recipients of housing benefit. It must again be stressed in this context that the calculation of potential for receiving housing benefit involves a degree of uncertainty, and the results given below must be interpreted in the light of this.

Entry into and exit from the group of potential recipients of housing benefit

The numbers of families in the longitudinal data material which appear from the model to have been entitled to housing benefit are shown in Table 4.6. For each year, these families are grouped according to whether they were still potential recipients in the following year, or whether they had left the group. Thus, families designated 'remaining' were also potential recipients in the following year, whereas families designated 'left' were not.

Table 4.6 Turnover in the group of potential housing benefit recipients in the sample

	1987	1988	1989	1990	1991
Housing benefit for non-pensioners	----- % -----				
Remaining	31.9	36.0	33.3	31.7	33.1
Left	68.1	64.0	66.7	68.4	66.9
Total	100.0	100.0	100.0	100.1	100.0
Total number	2,138	2,038	2,454	2,765	3,090
Housing benefit for pensioners	----- % -----				
Remaining	62.2	61.9	61.5	61.1	61.0
Left	37.8	38.1	38.5	38.9	39.0
Total	100.0	100.0	100.0	100.0	100.0
Total number	1,688	1,522	1,426	1,462	1,532

Source: Own calculations based on data in registers at Danmarks Statistik.

The calculations show that around 33% of potential recipients of housing benefit for non-pensioners remained in that group the year after, while the other 67% had left it. This proportion remained relatively constant throughout the period 1987-1991. In the case of potential recipients of housing benefit for pensioners,

62% were still potential recipients the following year, while 38% had left the group.

In comparison with actual recipients of housing benefit, the movement in and out of the group of potential recipients was much larger. There thus appears to have been a truly massive turnover in potential recipients of housing benefit for non-pensioners, while the difference was less marked for potential recipients of housing benefit for pensioners.

In order to investigate how great a proportion of potential recipients were newcomers to the group in any given year, and to what extent these are related to the proportion of potential recipients who left the potential group, an account of potential recipients is shown in Table 4.7. As before, the potential recipient families in a given year are grouped according to whether they remained in or left the potential group in the following year. They are also grouped according to whether they had or had not been entitled to receive housing benefit before the year in question. Those that had not been entitled to receive housing benefit in the previous year are designated 'new' potential recipients, while those that had been entitled to receive housing benefit before are designated 'old' potential recipients.

Table 4.7 Turnover in the group of potential housing benefit recipients in the sample, showing proportions of 'old' and 'new' potential recipients.

	1988		1989		1990		1991	
	----- % -----							
Housing benefit for non-pensioners	Old	New	Old	New	Old	New	Old	New
Remaining	54.1	26.8	54.3	24.4	47.6	25.0	47.9	27.3
Left	45.9	73.1	45.7	75.6	52.4	75.0	52.1	72.7
Total	100.0	99.9	100.0	100.0	100.0	100.0	100.0	100.0
Total number	682	1,356	733	1,721	818	1,947	875	2,215
	----- pct. -----							
Housing benefit for pensioners	Old	New	Old	New	Old	New	Old	New
Remaining	72.6	38.1	75.0	35.3	76.3	38.5	74.7	41.7
Left	27.4	61.9	25.0	64.7	23.7	61.5	25.3	58.3
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Total number	1,050	472	942	484	877	585	894	638

Source: Own calculations based on data in registers at Danmarks Statistik.

Table 4.7 shows that around two thirds of potential recipients of housing benefit for non-pensioners were new entrants to the group in any given year, whereas the proportion is around one third of potential recipients of housing benefit for pensioners.

As was found to be the case for actual recipients in the results given earlier, a large proportion of new potential recipients described here ceased to be potential recipients the year after they entered the group. This proportion was almost 75% for new potential recipients of housing benefit for non-pensioners, while only around 49% of the old potential recipients left the group. For potential recipients of housing benefit the proportion exiting was a little lower; 62% of new potential recipients ceased to be in the group the following year, compared with 25% of the old potential recipients.

In the light of this information, it is of interest to discover what factors characterise those who left the group of potential recipients.

The very rapid turnover of potential recipients could for example be the result of the potential recipients beginning to actually receive housing benefit in the following year. For the *non-pensioners*, this explanation would appear to account for approximately 16% of the potential housing benefit recipients who left the group each year. A similar proportion of families ceased to exist in the data set for the following year. In the data set, family units can cease to exist for several reasons, namely that one or more members of the family dies, emigrates, or becomes part of another family. The first of these causes is perhaps not so relevant for recipients of housing benefit for non-pensioners, who are not yet of retirement age, and thus not so old. On the other hand, changes in the family composition can be assumed to be frequent for recipients of housing benefit for non-pensioners. Such changes take place when, for example, a single man moves in with a woman, with the result that his original family registration ceases to exist. Naturally, these non-existent families cannot be entitled to housing benefit, and consequently they leave the group of potential recipients.

Another obvious reason for leaving the group of potential recipients is that a family no longer lives in rented accommodation; the data show that this applies to slightly more than 20%. Another 20% of families in the sample had an increase in income of more than DKK 50,000, and such an increase could very well have affected their right to housing benefit. Similarly, rental costs fell by more than DKK 10,000 for around 9% of the group, which in some cases could be related to changes in family composition.

With regard to pensioners leaving the potential housing benefit group, around 37% of them became actual recipients of housing benefit for pensioners in the following year. In addition, 25% of families either ceased to exist or were reduced in size. The most probable reason for this would be that one or more family members died or moved into a nursing home. A little under 15% of families ceased to be tenants; and consequently, though they might have continued to be entitled to receive housing benefit, they would have no longer been covered by

this analysis of potential recipients, which concerns only tenants. Finally, rental costs for around 15% of families fell by more than DKK 10,000 per annum.

If on the other hand we examine the characteristics of *new* potential recipients of housing benefit for non-pensioners, we find that over a quarter of these family units had come into existence since the previous year. A little under 15% of the new potential recipient families did exist the year before, but were not tenants. For around 15% of the new potential recipients, entitlement to housing benefit was associated with a fall in income of more than DKK 50,000, which in a number of instances was associated with one or more people leaving the family. Rental costs increased by more than DKK 10,000 per annum in just under 10% of cases.

Among pensioners, just under 15% were not tenants in the previous year, and around 7% were newly registered family units. It was a characteristic of this group that there were few cases of large changes in either income or rent. Thus only 10% of families experienced a drop in income of more than DKK 50,000 per year, and in around half of these cases this was associated with a reduction in the number of family members. Only in around 5% of cases did rental costs increase by more than DKK 10,000 per year.

The above analysis gives an indication of what characterises families that enter or leave the ambit of housing benefit legislation in any given year. Another central point to consider concerns the families who remain potential recipients for a long period, and the way in which they differ from the potential recipient group as a whole.

Long-term status as a potential housing benefit recipient family

In order to show how the potential amount of housing benefit varies with the length of the period of entitlement, Table 4.8 presents average amounts of housing benefit and the most important factors that determine these amounts. The information has been drawn up both for all families who were potential recipients of housing benefit in 1990 and 1992 and also for those families who were potential housing benefit recipients throughout the period 1990-1992.

Of non-pensioner families, there were 3,443 potential recipients of housing benefit in the longitudinal data set, of whom 419 were potential recipients throughout the period 1990-1992. As can be seen from the table, average potential housing benefit was lowest for the families who were potential recipients for a longer period. This point should be viewed in conjunction with the finding that it is those families which are entitled to the largest amounts that are the most likely to claim housing benefit (see Chapter 3). Among the families who ceased to be potential recipients there were a proportion who became actual recipients.

Table 4.8 Differences in potential housing benefit in the sample, according to period of entitlement

	December 1990		December 1992	
	All potential recipient families	Potential recipient families 1990-1992	All potential recipient families	Potential recipient families 1990-1992
Housing benefit for non-pensioners	----- DKK -----			
Average annual amount	4,402	4,225	5,481	4,912
Income	95,993	87,840	97,558	91,294
Annual rent	28,379	27,546	29,707	29,879
Family type:	----- % -----			
One adult, no children	66.5	73.7	65.9	74.0
One adult, with children	16.7	12.6	17.2	12.6
More than one adult, no children	9.0	5.2	8.5	5.3
More than one adult, with children	7.8	8.5	8.4	8.1
Total	100.0	100.0	100.0	100.0
Total number	2,765	419	3,443	419
Housing benefit for pensioners	----- DKK -----			
Average annual amount	9,667	8,880	10,057	11,260
Income	82,569	85,442	91,302	86,766
Annual rent	25,270	24,987	26,739	27,545
Family type:	----- % -----			
One adult	79.8	82.3	75.7	84.7
More than one adult	20.2	17.7	24.3	15.3
Total	100.0	100.0	100.0	100.0
Total number	1,462	668	1,593	668

Source: Own calculations based on data in registers at Danmarks Statistik.

Income as calculated for housing benefit was on average lower for those families who were entitled to housing benefit for the whole of the period 1990-1992. This was the case despite the fact that these families were on average entitled to less housing benefit than the entire group of potential recipients in both 1990 and 1992. The reason for this is that a large majority of families who are potential recipients of housing benefit for non-pensioners over a long period are adults without children. As already explained, people in this group are not entitled to as much housing benefit as pensioners and non-pensioners with children.

In 1990 there were 1,462 potential recipients of housing benefit for pensioners in the longitudinal data set, of whom 668 were potential recipients throughout

the period 1990-1992. For the potential recipients, the amount of housing benefit entitlement was lowest for families entitled to benefit throughout the period 1990-1992, since this group had a higher income on average and slightly lower rental costs.

In 1992, however, this same group of long-term potential recipients had an increased potential amount of housing benefit. This finding should be viewed in the light of the fact that as time went by, there was an increasing proportion of one-person families in the sample, and the family income was lower than for families with more than one adult. At the same time, average rents rose – perhaps because the proportion of pensioners living in expensive special pensioner housing could have risen in step with the increasing age of the group.

The switch potential group (delayed take-up)

It has been suggested that one reason for non-take-up may be that there is a time lapse between the point in time when a family becomes entitled to benefit and the point in time when they claim it. The international literature on the subject places considerable weight on this idea; Craig (1991), for example, pinpointing this area in particular as one requiring further study. Nevertheless, empirical research on this topic is surprisingly sparse. In Denmark, where the phenomenon has been termed ‘the switch potential group’ by the Ministry of Finance (Finansministeriet *et al*, 1995), there has been no research at all. This is due to the fact that previous studies of potential recipients of housing benefit have been made using cross-sectional data. Any analysis of the switch potential has to be based on data for potential recipients, but cross-sectional data do not permit such analyses to be made.

Table 4.9 shows how large a proportion of potential recipients of housing benefit for non-pensioners in December of any given year began to receive benefit in one of the succeeding years, and were thus part of the switch potential group. There is also for each year a remainder who had not begun to receive housing benefit at the end of the period in 1992. The closer the year for analysis is to 1992, naturally, the larger this remainder becomes, since there are ever fewer years for which to calculate the switch potential group.

As can be seen from Table 4.9, 10.6% of the potential recipients of housing benefit for non-pensioners in 1987 began to receive housing benefit in the following year, 1988. In the succeeding years, too, a number of the potential recipients for 1987 began to receive housing benefit, though the proportion of new recipients decreased year by year. Almost 28% of these potential recipients for 1987 had begun receiving housing benefit for non-pensioners by the end of the period under examination.

Table 4.9 Proportion of potential recipients of housing benefit for non-pensioners who began to receive housing benefit in succeeding years (the switch potential group).

	1987	1988	1989	1990	1991
In the switch potential after:	----- % -----				
One year	10.6	8.6	10.4	11.2	12.3
Two years	5.6	6.2	6.3	7.5	.
Three years	4.4	4.7	5.4	.	.
Four years	3.7	3.5	.	.	.
Five years	3.2
Switch potential group, total:	27.5	23.0	22.1	18.7	12.3
Remainder	72.5	77.0	77.9	81.3	87.7
Total, %	100.0	100.0	100.0	100.0	100.0
Total number	2,138	2,038	2,454	2,765	3,090

Source: Own calculations based on data in registers at Danmarks Statistik.

To the extent to which comparable calculations could be made for the following years, the proportion of potential recipients who later began to receive housing benefit for non-pensioners appears to mirror the 1987 figures to a considerable degree (see Table 4.9). Perhaps, however, except in the case of 1988, there is a tendency for the proportion of potential recipients who began to receive housing benefit within two years to increase over the period 1987-1992.

Table 4.10 shows a similar presentation of the results for potential recipients of housing benefit for pensioners. This shows that under 13% of the potential recipients of housing benefit for pensioners in 1987 received housing benefit in the following year. This proportion rose during the period under consideration. After two years, a further 8% of the potential recipients in 1987 had begun to receive housing benefit. There remain a proportion of the potential recipients who began to receive benefit in succeeding years, though the size of this proportion gradually decreases year by year. In this way around 35% of the potential recipients of housing benefit for pensioners from 1987 had begun to receive benefit by the end of 1992.

Since the calculations were made on the basis of families who received housing benefit in the month of December, it is possible that the size of the shift potential group presented here might be underestimated. This is because families who in one year were potential recipients of housing benefit might have received benefit during the period from January to November of the following year, and yet would not have been included in the calculations. However, since December is the month in which most families receive housing benefit, this effect can be assumed to be of little importance.

Table 4.10 Proportion of potential recipients of housing benefit for pensioners who began to receive housing benefit for pensioners in succeeding years (the switch potential group)

	1987	1988	1989	1990	1991
In the switch potential after:	----- % -----				
One year	12.9	13.2	13.1	15.5	16.2
Two years	8.2	7.8	8.1	8.6	.
Three years	5.5	6.0	6.8	.	.
Four years	4.1	5.3	.	.	.
Five years	4.4
Switch potential group, total	35.1	32.3	28.0	24.1	16.2
Remainder	64.8	67.7	72.0	76.0	83.8
Total, %	99.9	100.0	100.0	100.1	100.0
Total number	1,688	1,522	1,426	1,462	1,532

Source: Own calculations based on data in registers at Danmarks Statistik.

As can be seen from the above two tables, the switch potential appears to be a significant factor for housing benefit for both pensioners and non-pensioners. The analysis shows that around 10% of the potential recipients of housing benefit for non-pensioners and around 13% of the potential recipients of housing benefit for pensioners in any given year are actual recipients in the following year. This tendency continues in succeeding years, though at a reduced rate. Thus around 35% of the potential recipients of housing benefit for pensioners in 1987 had actually begun to receive benefit by 1992, while the same was true of almost 28% of potential recipients of housing benefit for non-pensioners. Thus the take-up rate can partially be explained by the fact that time elapses between the point in time at which a family becomes entitled to benefit and the time when it actually begins to receive benefit.

4.3 Summary

In Chapter 3 it was shown that the take-up rate for housing benefit for non-pensioners rose during the period from 62% in 1987 to 67% in 1992; the figures for housing benefit for pensioners during the same period are 80% and 85%. While the rate of take-up therefore increased for both types of housing benefit, the data show that the take-up rate was significantly higher for housing benefit for pensioners than for housing benefit for non-pensioners.

The analyses presented in Chapter 3 also showed that the probability of receiving housing benefit increased with the amount of entitlement. However, as was mentioned in Chapter 1, Corden (1995) has noted that the probability that bene-

fit will be claimed also increases with the length of time for which it can be received. This underlines the importance of not only analysing take-up on the basis of cross-sectional data, but also of using longitudinal data.

The Ministry of Housing and Building earlier made an analysis for *actual* recipients of housing benefit (Boligministeriet, 1991) in which housing benefit recipients were monitored for the period December 1986 to December 1987. The new calculations support and give greater validity to the Ministry's results, which showed that around one third of actual recipients of housing benefit for non-pensioners left the scheme in the year after joining it, while this was only true for one tenth of recipients of housing benefit for pensioners.

The very large turnover of actual recipients of housing benefit for non-pensioners is connected with the fact that a large proportion of completely new recipients in particular leave the scheme after one year. This should be seen in the light of the fact that income in particular varies considerably for this group, which is rarely the case for pensioners. Thus nearly 50% of recipients of housing benefit for pensioners in 1992 had been in receipt of housing benefit for more than five years, which was only the case for 12% of recipients of housing benefit for non-pensioners. Not only do pensioners receive benefit over a longer period, they also receive on average a larger sum in benefit than recipients of housing benefit for non-pensioners. This is partly due to the fact that pensioners' nominal incomes are often lower, and partly because the regulations for housing benefit for pensioners are more generous than those for recipients of housing benefit for non-pensioners, especially in the case of families without children.

The turnover for the group of *potential* recipients of housing benefit appears to be very high. Approximately two thirds of potential recipients of housing benefit for non-pensioners lose entitlement to benefit in the following year, while the same applies to just over one third of potential recipients of housing benefit for pensioners. Furthermore, for both schemes it is to a large extent the new potential recipients who quickly disappear from the group of potential recipients.

The dynamic analyses presented in this chapter show that a larger proportion of the potential recipients of housing benefit for pensioners than of the potential recipients of housing benefit for non-pensioners later became actual recipients. Around 10% of potential recipients of housing benefit for non-pensioners and around 13% of potential recipients of housing benefit for pensioners in a given year become actual recipients in the following year. This tendency continues in the following years, though the proportions gradually diminish. Thus, 35% of the potential recipients of housing benefit for pensioners for 1987 became actual recipients in the course of the following five years. For potential recipients of

housing benefit for non-pensioners the corresponding proportion was nearly 28%.

We thus see not only that the take-up rate is higher for housing benefit for pensioners, but also that the explanation for non-take-up for housing benefit for pensioners is to a greater extent the effect of delays in claiming it.

As the foregoing analyses have shown, pensioner families are in general entitled to larger amounts of benefit than non-pensioner families, and they can also receive benefit for a longer period. This may well be one of the main explanations for the rate of take-up being higher for housing benefit for pensioners than for housing benefit for non-pensioners.

5. Take-up in Denmark: Summary

The Rockwool Foundation Research Unit has, over a number of years, carried out research on the shadow economy in Denmark. Up until now, this work has been concentrated on the financial reasons for the growth of the shadow sector. Non-financial factors such as morality and the perceived risk of punishment have not hitherto been included.

For this reason, a Research Unit project entitled 'Citizens and the Laws' is currently underway. The project seeks to establish how 'morality' (interpreted in this context as 'propensity to abide by the law') has changed in Denmark over the last twenty to thirty years, and to determine what may lie behind such changes as might have occurred. The project will also examine possible parallel changes in ways in which the law is regarded, investigating such changes in attitude through an examination of actions which fall just short of breaking the letter of the law, while at the same time clearly breaching the intention of the law.

When studying attitudes to the law, an obvious related area for investigation is the degree to which citizens avail themselves of their legal entitlements to welfare benefits. If there has been a general shift in moral standards, this may be reflected in a change in the take-up rate for welfare benefits, which seldom reaches the 100% level.

In the international literature concerned with the problem of take-up, several reasons are normally given for non-take-up of benefits.

Firstly, such non-take-up may be the result of an information problem, in that potential recipients are not aware of their entitlement to a particular welfare benefit. Secondly, applying for welfare benefits can involve a number of costs to the applicant. These may be either of a financial nature, including the cost of the time required to make the application, or costs of a moral nature, in that some people may find it shameful to accept assistance from public funds. Other reasons are also mentioned in the literature: for example, non-take-up may be due to delays in the process of claiming benefit, in that time elapses between someone becoming entitled to benefit and their actually claiming it.

In this context, there have been discussions as to what conclusions can be drawn from non-take-up of benefit. According to Lindbeck (1995), non-take-up should be viewed in connection with the social norms which form the basis of the welfare state. He believes that a rising rate of take-up may be an indication that an increasing number of citizens regard it as their right to receive welfare benefit payment, regardless of whether they have a real need for them. If non-take-up is in fact an expression of the individual citizen's choice between receiving or not

receiving welfare benefits, then it might be felt that it need not to be regarded as a problem.

However, Atkinson (1989 and 1995) has stressed several times that non-take-up does have certain implications related to benefit distribution – implications which mean that action should be taken. If there are no other benefits that citizens can claim instead, the consequence of non-take-up must be that some people are existing at below the minimum level which the welfare state aims to ensure for all. However, even if there are other forms of benefit which can bring claimants above the minimum standard of living, non-take-up may still be interpreted as an expression of some deficiency in the existing social system. For this reason, a low level of take-up should give cause to consider whether the benefit structure should be revised.

International studies have in fact revealed a connection between take-up and the structure of any given benefit scheme. These studies have shown that the more complex the rules are regarding a particular benefit scheme, the greater is the probability that the benefit will not be paid out to someone entitled to receive it. Similarly, if eligibility for benefit is determined on the basis of social criteria, or if the benefit is only a supplement to other income, the probability of its being paid is reduced.

If one examines the structure of Danish welfare benefit schemes, one might expect that for some of them the take-up rate will be close to 100%. This applies, for example, in the case of the public old-age pension, for which the eligibility criteria are simple, and only to a limited extent dependent on social factors, and for which furthermore future recipients are informed of their entitlement. In other areas, the rate of take-up may be expected to be significantly lower. This is true of housing benefits, for example, for which the regulations are complex and depend on social factors, and for which potential recipients are not always informed of their entitlement.

Systematic measurements of take-up rates for a range of benefits are not made in Denmark as they are in, for example, the United Kingdom. However, the Danish Ministry of Economic Affairs has carried out a number of measurements of take-up for housing benefits during the past few years, and in connection with these studies measurements have also been made for other welfare benefits.

Chapter 2 describes two of these calculations of potential take-up for housing benefits, these being the earliest and the most recent in the Ministry series. The calculations are for 1986 and 1993, but are based on somewhat different procedures, so that the results are not directly comparable. Both sets of calculations show that the take-up rates are highest for those groups entitled to the largest amount of benefit, namely pensioners and families with children. The results

also suggest an increase in the rate of take-up between 1986 and 1993, though the validity of this conclusion is weakened by the fact that, as already stated, the results were not fully comparable. The question of whether the potential take-up may be underestimated or overestimated is discussed in the chapter, a number of arguments being presented related to each of these possibilities. No conclusions are drawn on that question, though it is pointed out that the calculations involve a significant degree of uncertainty.

The other areas where the 'Law Model' at the Ministry of Economic Affairs has been used to make calculations of potential take-up are the scheme for providing day-care places free of charge, child benefit for single parents, and heating supplement as one of a range of benefits for pensioners. Furthermore, an estimate has been made of the financial costs involved if a recipient of an invalidity allowance switches to a disability pension scheme. This last is not a take-up calculation as such, since the disability pension can only be claimed if the person involved gives up paid employment.

Since the earlier Danish take-up calculations in the area of housing benefit were difficult to use for comparisons over time, a time series using consistent measurements of take-up was constructed for housing benefit for the period 1987-1992, as described in Chapter 3 of this volume. The new take-up calculations revealed an increase in the rate of take-up over the period from 62% in 1987 to 67% in 1992 for recipients of housing benefit primarily for non-pensioners, and from 80% to 85% for recipients of housing benefit for pensioners. (The two housing benefit schemes, that for pensioners and that for non-pensioners, have different regulations and levels of benefit.)

Despite the increase in the rates of take-up, it appears that the fact that not all potential recipients claimed their benefit resulted in a considerable saving to the Exchequer in 1992 of just under one billion Danish Kroner. The total expenditure on housing benefits for that year was DKK 6.8 billion, and this would have been 14% higher if all those entitled had claimed.

It is not possible to determine on the basis of the data available in the registers exactly why any given family should have failed to receive housing benefit for non-pensioners, but it is possible to suggest probable reasons. Using a United Kingdom study as a model, an investigation was made of the characteristics which appeared to be significant for whether or not a family received the benefit to which they were entitled, and to what extent these characteristics could be related to the possible explanations given earlier in this chapter.

The analyses show that the likelihood of receiving housing benefit increases with the size of the amount of the entitlement. This must be taken as confirmation, to some extent, of the assertion that in claiming housing benefit there is a

trade-off between the amount that can be obtained and the difficulty involved in claiming it. Such 'difficulty' can be of a moral nature, in that some wish to manage for themselves; this may particularly be the case for the self-employed, as the figures do indeed suggest. Alternatively, the difficulty might be connected with the time required to make the claim.

This picture is confirmed for recipients of housing benefit for non-pensioners by the finding that the more hours a person had been employed on the labour market for any given year, the less likely it was that that person received housing benefit. People in employment have, of course, less time available to invest in claiming welfare benefits.

In addition, some people will be quicker than others to understand the rules of the game. This may be the reason why students in particular, who are used to claiming student maintenance grants, appear to be particularly likely to be in receipt of the housing benefit to which they are entitled, even though the amounts of benefit are comparatively small. Another reason for this may be that within this relatively homogenous group (i.e. students) there are many who will be entitled to housing benefit for non-pensioners, and this increases awareness of the existence of the benefit.

Information about housing benefit may also be distributed by those who work in the field of social security. It may be that this source of information is important in the case of the recipients of other social security benefits, if their case officers are knowledgeable concerning the relevant legislation. Similarly, social contacts within publicly-owned housing associations can help to make newcomers aware of the existence of housing benefit.

If one accepts Atkinson's comments on the implications of non-take-up, these conclusions are obviously disturbing. Housing benefit is intended for *all* who are in a particular type of situation with respect to income and the cost of their homes; but it may well be that it is in fact obtained more readily by those who have the assistance of professional welfare advisors, or who are better able to understand the relevant regulations.

Chapter 4 describes certain dynamic aspects of the housing benefit for pensioners scheme. The length of time for which housing benefit recipients are in receipt of benefit is investigated, together with the extent to which non-take-up is due to delays in claiming benefit. The longitudinal data set is used to provide information concerning movement into and out of the scheme for actual and potential recipients for the period 1987-1992. Such an analysis has never been carried out before in Denmark, since calculations for potential recipients have until now only been made on the basis of cross-sectional data. As far as *actual* recipients are concerned, the Ministry of Housing and Building has earlier made

an analysis in which housing benefit recipients were monitored from December 1986 to December 1987 (Boligministeriet, 1991).

The new calculations give a wider validation to the Ministry of Housing and Building findings that around one third of all actual recipients of housing benefit for non-pensioners left the scheme in the succeeding year, while this was only the case for one tenth of all recipients of housing benefit for pensioners.

This very large turnover among recipients of housing benefit for non-pensioners is linked to the fact that a particularly large proportion of completely new recipients dropped out of the benefit scheme after only one year. This should be seen in the light of the fact that income in particular varies considerably for this group, which is rarely the case for those who receive housing benefit for pensioners. Nearly 50% of recipients of housing benefit for pensioners in 1992 had been in receipt of this benefit for more than five years, while this was only true in the case of 12% of recipients of housing benefit for non-pensioners.

Not only do pensioners receive benefit over a longer period, they also receive on average a larger sum in benefit than recipients of housing benefit for non-pensioners. This is due to the facts that pensioners' nominal incomes are often lower than those of non-pensioners, and that the regulations concerning housing benefit for pensioners are in general more generous than those concerning housing benefit for non-pensioners.

The turnover rate for potential housing benefit recipients was even greater than for actual recipients. Around two thirds of potential recipients of housing benefit for non-pensioners in any one year had dropped out of the potential group by the following year, while the same was true only for just over one third of the potential recipients of housing benefit for pensioners. For both schemes it was notable that it was very largely the new potential recipients who quickly left the group of potential recipients again.

In explaining the phenomenon of take-up, delays in applying for benefit (the so-called 'switch potential') are cited in Chapter 4 as a relevant factor. The analysis shows that around 10% of potential recipients of housing benefit for non-pensioners and around 13% of potential recipients of housing benefit for pensioners in any given year became actual recipients in the following year. This trend continued in succeeding years, though at a diminishing rate. Thus, around 35% of the potential recipients of housing benefit for pensioners in 1987 actually began to receive benefit during the period through to 1992, with the same being the case for nearly 28% of the potential recipients of housing benefit for non-pensioners in 1987. This appears to confirm that the take-up phenomenon, at least for housing benefit in Denmark, can be partly explained by the passage of time between the beginning of entitlement and actually receiving benefit.

However, the results also show that this is only a part of the explanation for non-take-up.

The very high rate of turnover for both actual and potential recipients of housing benefit for non-pensioners must naturally also be viewed in the light of the fact that neither income nor family composition nor place of abode are particularly stable for this group. Consequently, the decision to seek or not to seek housing benefit is only relevant for a short period for this group, and the amount of benefit involved is relatively modest.

In the case of pensioners the amount of benefit involved is greater, and the period for which it can be obtained is much longer; these are both factors which accord with expectations that the rate of take-up will be higher for this group.

The most important results of the study described in this volume are the following:

- A series of new calculations based on consistent methods of measurement shows a rising rate of take-up for Danish housing benefits over the period 1987-1992.
- It was found that the probability of receiving housing benefit increased with the size of the amount of benefit entitlement. There was also a strong indication that students, recipients of income support, and residents in publicly-owned housing associations were more likely to receive the housing benefit to which they were entitled than were other groups.
- Turnover was found to be least among actual recipients of housing benefit for pensioners, so that almost half the actual recipients of the benefit in 1992 had been in receipt of it for more than five years, while the same was true for only 12% of actual recipients of housing benefit for non-pensioners.

It was found that delays in claiming benefit can *partially* account for non-take-up of housing benefits, in that around 35% of the 1987 potential recipients of housing benefit for pensioners had become actual recipients by 1992, while the corresponding proportion for potential recipients of housing benefit for non-pensioners was just under 28%.

Appendix 1

1.1 Calculating the potential recipients for 1986

The starting point for these calculations was the 76,300 households contained in the cross-sectional data for the Law Model in 1986. These households were reduced in various ways to arrive at the target group for the calculations, which consisted of households living in rented accommodation and not receiving housing benefit. Excluding households living in owner-occupied or co-operative housing association accommodation left 35,190 households. Pensioners living in nursing homes were also excluded, leaving 33,600 households. Of these, only families with children living at home were included, leaving 33,500 households. 10,700 of these were receiving housing benefit, leaving 22,800 households in the target group. In fact, these should have been further reduced to include only households in accommodation with access to kitchen facilities. The grossing up factor for this sample was 30.

There was no rent information available for 7,500 of the households in the target group. The missing rent information was imputed on the basis of the Rent Survey conducted by the Danish Ministry of Housing for the year of 1985. The dwellings without rent information were categorised according to the same criteria as were applied in the Rent Survey, i.e. year of construction of the building, size in square metres, and the standard of toilet, bathroom and heating facilities. A further categorisation was made according to ownership, i.e. private, publicly-owned housing association, or public (central and local government). In this process approximately 1,300 households had to be excluded from the calculations, because the necessary information concerning their accommodation was not available and therefore their rents could not be imputed. For the remaining 6,200 homes without original information on rents, the average rents per square metre for the relevant categories from the Rent Survey were applied. More than 500 different levels of rent per square metre were constructed and used in this process, so the imputations were quite detailed; nevertheless, since the constructed rents were based on average rents some of the variation, which is important for calculation of the potential, was missing. The average rents were furthermore 'country' averages neglecting the regional variation.

The rent levels were in 1985 prices. These were adjusted to 1986 prices by adding a uniform 5 per cent increase to all rents. It was not possible to adjust the rents according to building maintenance commitments and special forms of heating, as is done in real housing benefit cases. Furthermore, the household unit used was too large; but it was not (and still is not) possible to simulate a housing benefit household exactly. It is, however, now possible to make a better estimate, as explained below.

1.2 Calculating the potential recipients for 1993

The 1993 sample had the same basic problem as the 1986 data, namely that for a substantial number of homes no information on rent was available. However, a different solution to the problem was used in this instance. The target group was categorised according to building ownership (private, publicly-owned housing association or public) and the size of the dwellings. In this process some of the previously used categories were consolidated, but nevertheless there was still considerable variation between these various categories in terms of the proportion of homes for which information on rents was missing. Taking as a basis the group with the smallest proportion of dwellings for which there was rent information, a new representative sample was created in such a way that there was the same proportion of homes in each group for which there was rent information available. The selection of the flats to be included in the new sample was made on a random basis from the original sample.

This procedure avoided the need to impute rents, but it also drastically reduced the sample size. The original group was a 10 per cent random sample of the households in Denmark, so there was a grossing up factor of 10. The reduced representative sample contained 5,965 households, and had a grossing up factor of 78. It could also be argued that even more criteria should have been included in the first round of categorisation, e.g. the age of the building and the region in which it was located.

The rent information was for 1991. This was converted to average 1993 prices by making a uniform percentage increase for all rents in the sample.

The recipient unit used in the 1993 calculation of potential was the d-family, one of the standard family units defined by Danmarks Statistik. This unit was adjusted in such a way that young people living at home were categorised as either children or adults, in accordance with the housing benefit scheme regulations. The d-family is not ideal, but it is better than the household, the recipient unit in the 1986 calculation. The adjusted d-family was also used in the calculations based upon longitudinal data.

1.3 Summary

The estimation of potential recipients involves significant uncertainty, because it is not possible to create a housing benefit 'case file' with great accuracy for those who do not already have one. The recipient units used are not perfect, but the adjusted d-family concept is getting close. The time dimension for income is not correct, but the biggest problem is the missing rent information. In the calculations for 1986 and 1993 this problem was resolved in two different ways. In the 1986 calculation, substantial imputations were made on the basis of external informa-

tion on average rents for different categories of accommodation. In the 1993 calculation the data set was very substantially reduced in size in order to create a representative sample which could rely solely on internal information. The 1993 procedure is probably the best. The d-family is closer to the housing benefit recipient unit than is the household; the target group for use in the estimates was more accurately determined in 1993; and it is in principle better to rely on internal information only, though in this case there was hardly any significant difference between the two data sources (cross-sectional data and the Rent Survey). The price of using internal data was, however, a very substantial reduction in the size of the data set used as the basis for the estimates of potential recipients.

Appendix 2: Description of the data material

Calculating take-up for housing benefit places heavy demands on the formatting of the data to be used. This is because the rules concerning housing benefit are complex, and there are numerous criteria involved in determining entitlement. Consequently, a great deal of information is required about each individual family in order to calculate housing benefit, and, furthermore, it is not possible to set out in advance a clear definition of which types of family might be entitled to such benefit. As a result, in order to identify even a relatively modest selection of potential recipients of housing benefit, it is necessary to begin by obtaining much information about a large number of families.

The data sets used for the calculations in Chapters 3 and 4 are based on information extracted from four registers at Danmarks Statistik. The data material is unique in that model data covering several years has never before in Denmark been constructed on the basis of these registers: model data in which the same families are monitored over several years, and from which it is possible to make calculations of take-up for housing benefit. For a further description of the data set see Hultin (1996), on whose work this survey is based.

2.1 The creation of the data sets

The data material consists of seven data sets, of which six are composed of longitudinal data from 1987 to 1992, while the seventh is simply a random selection of three per cent of *all* families⁶ in Denmark in 1992. This sampling system design makes it possible to monitor the same families over a number of years. These families, which in 1987 constituted a representative sample of Danish families, cannot be expected to have continued to be a representative sample. It is, however, assumed that the actual changes that the families in the sample experienced were representative of changes undergone by Danish families in general.

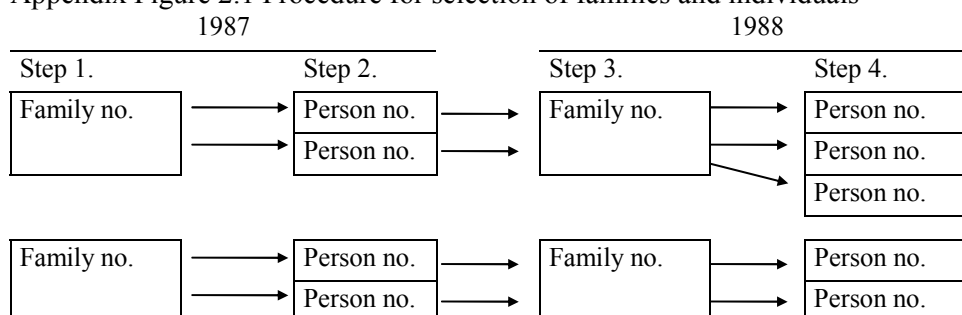
On the basis of the cross-sectional data set for 1992 it is thus possible to estimate the degree to which the take-up calculations for the longitudinal data sets are influenced by developments and changes within the original families.

The six data sets which constituted the longitudinal data material were created as follows. A random three-percent sample was taken of all families in Denmark in 1987 (step 1). Each of the selected families consisted of a number of people, and these individuals were linked to the data set (step 2). The data for 1988 were based on these individuals, and the families to which they then belonged were found (step 3). On the basis of the family numbers, all the people in the selected families in 1988 were found (step 4). This procedure was followed for

⁶ As defined by Danmarks Statistik as 'd-families', see Appendix Section 2.2.

the succeeding years through to 1992, so that the longitudinal data material covered the years 1987-1992. The procedure for the first two years is illustrated in Appendix Figure 2.1.

Appendix Figure 2.1 Procedure for selection of families and individuals



This procedure, which forms the basis of the longitudinal data sets, resulted in the number of persons included in the sample increasing over the period 1987-1992. This is a consequence of the fact that individuals who left their 'original' families continued to be monitored and included in the data, while new family members were also included as from the year in which they first appeared. The only people who ceased to be monitored were those who were removed from the Danish national register, for example as a result of death or emigration. However, the number of such people was much smaller than the number of those who became new members of the families.

Appendix Table 2.1. Population of families and individuals

Year	1987	1988	1989	1990	1991	1992	1992 cross-section
----- number in the data sets -----							
Persons	155,593	163,104	169,607	176,181	183,360	191,039	156,124
- of whom, living in DK	153,894	161,164	167,511	173,927	180,907	188,434	154,512
Families	75,392	78,493	82,248	86,131	90,103	94,075	77,992
- of whom, living in DK	74,582	77,630	81,305	85,121	89,013	92,914	77,213
----- total number in Denmark at 01/01 -----							
Families in DK	2,486,830	2,503,293	2,522,798	2,540,450	2,557,728	2,572,332	2,572,332
Grossing-up factor	33.34	32.35	31.03	29.85	28.73	27.69	33.31

Note: The figures for the 1992 cross-sectional data are given in the column headed '1992 cross-section'.

Sources: Danmarks Statistik, and own calculations made on the basis of extracts from registers at Danmarks Statistik.

The numbers of people and families in the longitudinal data sets are shown in Appendix Table 2.1. A small number of these persons were temporarily resident in Greenland, which, because of that country's relationship with Denmark, meant that they continued to be included in the Danish national register. Since these families were not entitled to housing benefit under Danish regulations, they were therefore excluded from the analyses. The total numbers of individuals and families – excluding those resident in Greenland – are therefore also shown in the table. Finally, the total number of d-families in Denmark used in the calculations shown in Tables 4.1 and 4.2 is given.

A number of background variables have been found for each individual and each year. These have been taken from four source registers at Danmarks Statistik: the family/household register, the register of income statistics, the housing benefit register, and the building and housing register.

2.2 The conceptual definition of the family over time

The conceptual definition of 'a family' used for the data material is that designated by Danmarks Statistik as the 'd-family'. A d-family is defined as consisting of one or more individuals living at the same address and belonging to any one of the following categories: a single person, a married couple, a registered couple, a cohabiting couple with children born of the relationship, a cohabiting couple without children born of the relationship. Children living at home are only defined as such if they are unmarried and do not themselves have children living at home. The d-family differs from the c-family (the family concept definition normally used by Danmarks Statistik) in that no limit is placed on the age of children living at home. It is practical to use this definition in the context of housing benefit, for which the age limit for persons defined as children is not 18 years as might be expected, but 23 years.

Each d-family is identified by a d-family number, which:

- for families based around a couple is the national identity number of the woman.
- for other families is the national identity number of the oldest family member.

This definition of a d-family means that a family with the same members for two years in succession will have the same d-family number in each of those two years. If the composition of the family changes, on the other hand, the d-family number will not necessarily be the same. Appendix Table 2.2 shows a number of examples of changes in family composition which have an effect on the d-family number. The person who identifies the family is shown in bold type.

In the family compositions shown in Appendix Table 2.2, a child who leaves home will be given a new d-family number, on the basis of either his or her own national identity number or that of a partner with whom a new home is established. The rest of the family will retain the original d-family number, which is identical to the woman's national identity number. A man who moves in with a woman will be given her d-family number, whereas the woman keeps her old one. If a woman dies, the d-family number based on her national identity number will be removed from the family/household register for the following year. The surviving man will be allocated a new d-family number.

Appendix Table 2.2. Changes in family composition

1987	Event:	1988	Result:
Father, mother , 2 children	One child leaves home	Father, mother , 1 child	S
		Young single man	N
Man, woman	Have child	Father, mother , 1 child	S
Single man	Moves in with woman		F
		Man, woman	N
Single woman	Gets married	Man, woman	S
Elderly woman	Dies		F
Father, mother , 1 child	Divorced	Mother , 1 child	S
		Man	N
Elderly man , daughter	Elderly man dies		F
		Woman	N
Elderly man, woman	Elderly woman dies		F
		Elderly man	N

Key: S = Same family number, F = Family number ceases to exist, N = New family number

The examples given here do not constitute an exhaustive list, but they illustrate that the means by which family numbers are allocated has an effect on how long a group of people are regarded as belonging to the same family.

It should be emphasised that, for reasons concerning the protection of personal information, the national identity numbers and d-family numbers that appear in the data material are not the real numbers of the people involved. The numbers used are 'pseudo-numbers' that work in principle in the same way as shown in Appendix Table 2.2.

It can be difficult to see immediately from the above as to how the conceptual definition of the family which has been used will influence the longitudinal data

over time. To see these effects more clearly, the distributions of families according to type are shown in Appendix Table 2.3.

The figures are based on the longitudinal data set for 1987 and the cross-sectional data set for 1992, both of which are representative samples of families in Denmark, and the longitudinal data set for 1992, which may be subject to deviations from the norm in proportions of family types.

Appendix Table 2.3. Distribution of families according to d-family type

	1987	1992	1992 cross-sectional data
	----- percent -----		
Single persons, without children living at home	42.5	41.0	43.8
Single persons, with children living at home	6.0	6.7	6.1
Married couple, without children living at home	18.6	17.1	19.0
Married couple, with children living at home	23.3	19.4	20.4
Registered couple	Not applicable	0.0	0.0
Cohabiting couple, with children born of the relationship	2.5	4.2	3.3
Cohabiting couple ¹⁾ , without children	5.5	9.6	6.0
Cohabiting couple ¹⁾ , with children	0.9	1.5	0.8
Children under 18 not living with their parents	0.8	0.5	0.6
Total	100	100	100
Total number of individuals	75,392	94,075	77,992

Note: 1) Couples without children born of the relationship

Source: calculations based on extracts from registers at Danmarks Statistik

It can be seen from Appendix Table 2.3 that in 1987 single people without children living at home made up 42.5% of all families, compared with 43.8% of families in the 1992 cross-sectional data. In the longitudinal data for 1992 only 41.0% of families had this composition, which can be taken as an indication that this group is under-represented in this data set. While the number of families composed of single people or married couples without children are slightly under-represented in the longitudinal data set for 1992, single people with children and cohabiting couples of all types are somewhat over-represented.

Further evidence that the composition of the data material changes in relation to the norm is that the average age in the sample drops from 37.6 years in 1987 to 36.4 years in 1992 in the longitudinal data material, whereas the average age in the cross-sectional data for 1992 is 38.2 years.

It must however be emphasised that the longitudinal data is characterised by being the result of monitoring a number of families over time, and that the changes in these families can be assumed to be representative of changes in other families. This relationship between the longitudinal data and the 1992 cross-sectional data set must naturally be taken into account when interpreting the results in Chapters 3 and 4.

2.3 Pre-processing the data

In order to import the required variables into the housing benefit model described in Appendix 3, it was necessary to pre-process the data taken from the four source registers. In part, this processing consisted of excluding certain observations for which the values were so extreme that they had to be regarded as the results of errors in the registers. In other cases the creation of variables for the housing benefit model has necessitated the making of certain choices and weightings, and these could have affected the final results. It is these latter adjustments which are discussed below.

Owner-occupiers, tenants and shareholders in co-operative housing associations

Distinctions are made in the housing benefit model between owner-occupiers, tenants and shareholders in co-operative housing associations. This information is not given directly in any of the four data registers, but the data used have been constructed from variables for the ownership status code and letting status in the buildings and housing register, and from information in the income statistics register concerning the assessed property value and surplus 'income' from property.

People who live in private co-operative housing association property are assumed to be housing association shareholders. This assumption disregards the fact that some people living in such dwellings might in fact be simply tenants, for example if they had lived in the property since before its ownership status was converted to that of a co-operative housing association. In all other cases of property ownership, if a dwelling is registered as being 'used by the owner', the people living in the dwelling are classified as owner-occupiers, whereas if the dwelling is registered as being rented out, the occupants are classified as tenants.

In certain cases there is information in the data registers concerning the ownership status code, but not on letting status. In such cases it has been assumed that the occupants are tenants if the building is owned by the state, a municipality or a publicly-owned housing association. If, on the other hand, the building is owned by a private person, a limited company or any other type of non-publicly-owned company, and if information exists for the assessed property value or

surplus 'income' from property for at least one member of a family living there, then the residents are classified as being owner-occupiers. If no such information on income from the property exists, the residents are regarded as being tenants.

The ownership status code in the buildings and housing register for 1987 is based in most cases on information dating from 1977. In 1988, these codes were updated. For the longitudinal data sets, therefore, it was decided to use the updated code even for the year 1987 in cases of families living at the same address in 1987 and 1988. The effect of this change is *slightly* to increase the proportion of families recorded as living in private co-operative housing associations, and slightly to decrease the proportion recorded as living in rented accommodation. This is because the number of co-operative housing associations in existence increased after 1977.

Full tax obligation

The register for income statistics contains a number of people (2% of all those on the register) who do not have a full obligation to pay tax in Denmark throughout the whole of the year. This category includes seamen, who have only a partial obligation to pay tax, and people who are abroad for part of the year and people who die during the year, who have a full obligation to pay tax, but not for the whole of the year. Since the figures for social income for these people are not always in final form, the information available is of necessity somewhat arbitrary in nature. Consequently, these people have been excluded from the housing benefit calculations. In this respect the calculations of potential recipients for housing benefit differ from those of Hultin (1996).

Property taxes

To calculate housing benefit for property owners it is necessary to know the figures for property tax liability. The amount of property tax payable is calculated on the basis of the assessed nominal value of the land on which the building stands multiplied by a percentage which is fixed separately in each municipality.

The four registers from which the data sets were constructed contain no information about the assessed nominal value of land. However, the total value of each property can be obtained from the income statistics register. An estimate of the assessed nominal land value was therefore made on the basis of the assessed total property value for each dwelling, taking into account its position and type. The average proportion of the total property value constituted by the land value

was calculated as of January 1, 1986⁷ for each housing type (detached house, semi-detached house, terrace house, farmhouse, house occupied by more than one family, etc.) and for each assessment district. The land value for each individual dwelling was then calculated on the basis of the average proportion which the assessed land value constituted of the assessed total property value for the house type and assessment area, and of the actual assessed total property value for each individual home.

Rent

One of the greatest problems in calculating potential entitlement to housing benefit is the paucity of information on rents. Information on property values is normally only collected in connection with general property valuations. Thus, information was collected as of 01.10.85 and 01.09.91 in connection with the 18th and 19th general property valuations. This information is contained in the buildings and housing register.⁸ For the intervening years it has been necessary to estimate property rent levels.

In addition to the fact that information on property rent levels in Denmark is only compiled every five or six years, the information collected is, in fact, not complete. No information is collected for buildings containing fewer than three rented homes. As a result, information concerning rent levels is lacking for around one-third of the families living in rented accommodation. Furthermore, information on housing co-operatives was not collected in 1991.

The information which can be drawn from the rent variable is the rents as of 01.10.1985 for the years 1987-1991. In the data sets for 1992, the information from 01.09.1991 is used. For those years for which there is rent information for each individual family, there is thus an unadjusted figure from either 1985 or 1991. This unadjusted rent information has formed the basis for an extrapolation of the rents for the intervening years.

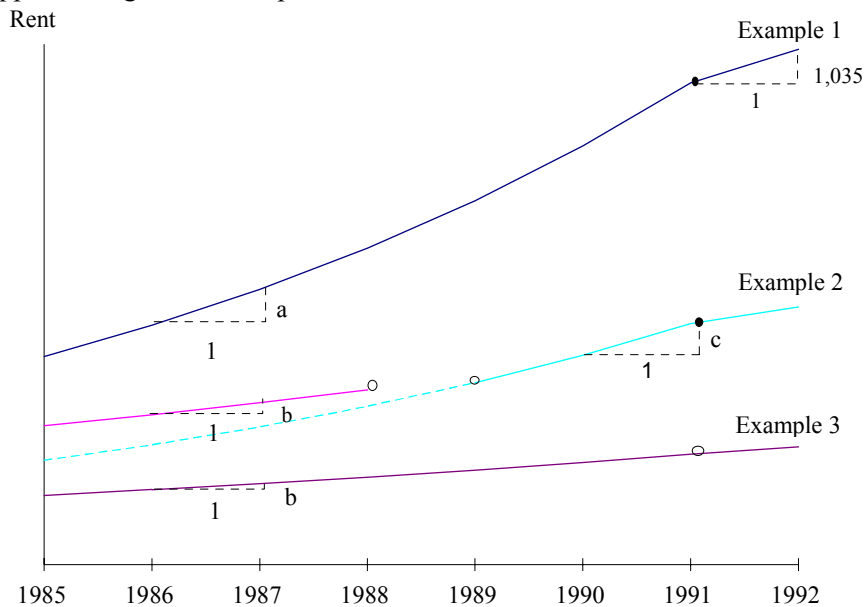
The calculations are dependent on how long a family lived in the same accommodation. If a family lived in the same dwelling for the entire period, the average annual rate of rent increase for the period 1985-1991 was calculated. On the basis of the consumer price index, this average rate of increase was then adjusted for each year in accordance with the way general changes in rents for the year varied from the overall change in rent for the period. Rents were then inter-

⁷ The information published in connection with the 19th general property valuation of January 1, 1992 was less detailed, and therefore calculations were made on the basis of the 18th general valuation. See Statskattedirektorat (1987).

⁸ Information has now been collected for use in the 20th general property valuation, but these figures were not available at the time when the data used in this project were drawn up.

polated on the basis of this calculation. This process is illustrated in a slightly simplified manner in Appendix Figure 2.2, example 1, in which the average annual growth rate is shown as (a). For 1992, the rent is extrapolated on the basis of the information of 01.09.1991, to which has been added a 3.5 percent annual increase, equivalent to the level of increase in the home rent section of the retail price index.⁹

Appendix Figure 2.2 Interpolation of home rents, 1985 to 1992



If, as in example 2, the family has only lived in the same place for a short period, in this case from 1989 to 1992, the rent for this period is interpolated from the average annual growth rate for home rents (c) from 1985 to 1991, as described in example 1. In 1987 and 1988, however, the house rent is projected at a percentage (b) equivalent to the normal increase in home rents¹⁰ during the period from 1985 to 1991. This was 7 % per annum for tenants in private rented accommodation, 5.5% p.a. for tenants in publicly-owned housing associations and 6.0% p.a. for other tenants.

For those families where no information was provided on rents as at 01.09.1991 but where the family had lived in the same accommodation since 1985, the rents were again interpolated from average rises in rent (b). This is illustrated by example 3.

⁹ Statistiske Efterretninger. Indkomst, forbrug og priser 1992:19

¹⁰ Boligministeriet (1992)

As has already been mentioned, no information was available for the approximately one-third of all families in rented accommodation who lived in buildings where fewer than three apartments were rented out, since information was not collected for such buildings. In the face of this difficulty, one option was to exclude all such families from the analysis and only make take-up calculations for tenants resident in larger apartment buildings. The other possibility was to make take-up calculations for all families on the basis of such information as did exist. This could be done by making calculations for all families where information concerning rents existed, and then by weighting the data. Alternatively, the missing rental information could be reconstructed. Both these methods would be based on the assumption that rents were not significantly different in large and small buildings.

Use of the weighting method was made more difficult by the fact that individual families were being monitored over a number of years, and the weightings for each family would change during the period. Similarly, it would have been difficult to monitor individual families if a significant proportion of the families involved were to have ‘dropped out’ of the ongoing analysis because of lack of information about rents.

Consequently, it was decided to construct figures for rents where necessary. The simplest method of doing this would have been to replace missing information with figures for the average rents for all families for which data was available. This would have ignored information which was in fact available about types of housing – information which could be assumed to be significant for rent levels. Another possibility would have been to make a regression for the completed observations where the rent or the rent per square metre was determined as a function of the characteristics of the housing (e.g. position, size, etc.), and then to transfer the results to the missing observations. A third possibility would have been to group the data material in accordance with a number of characteristics which were thought to affect the level of rent. The missing rent observations would then be allocated a value equivalent to the average for the appropriate group. Such a solution is equivalent to a regression in which the explanatory variable is a dummy variable representing the group concerned. However, Fox et al. (1990) point out a problem with these methods, namely that the variance of the response variable, in this case the rent, will be too small.

On the basis of these considerations it was decided to use the so-called ‘hot-deck’ method, which according to Fox et al. (1990) is an advance on the methods of constructing observations described above, since the variance of the variable is closer to that of the true spread. This method entails grouping the data according to those characteristics which are thought to be significant for the size of the variable for which it is desired to construct observations. In this case, housing was grouped according to four criteria: floor area, year of construction,

geographical position and type of ownership. Within each group, each dwelling for which rent information is lacking is allocated a rent figure for a selected equivalent dwelling for which there is information.

To provide an estimate of the size of the influence which the choice of method has on take-up calculations, the calculations for 1992 have also been made using the average values for rent in a group and also by constructing values by means of a regression. These calculations show that there is so little difference in the number of potential claimants of housing benefit that the level of take-up is to all intents and purposes unaltered. In practical terms, then, the effects of the method of constructing the missing observations for rent can be regarded as being of little significance.

It was considered desirable to avoid allocating different values for rent for each year for those families who continued to live in the same place for a number of years, though without information being available about their actual rent during this time. If new values had been allocated for each year, the constructed rents could have varied considerably from year to year, creating a picture of the family's housing situation which was more unstable than would have been the case in reality. Consequently, rents were allocated first for 1987, and if a family continued to live in the same accommodation for a period of time, their rent for successive years was calculated on the basis of the figure allocated for 1987, extrapolated on the principles illustrated in Appendix Figure 2.2. Those homes which were not allocated a rent for 1987, or in cases where the family had moved in the meantime, were allocated a rent for 1988. This process was continued in the same manner through to 1992.

Taxation of 'income' from property

In Denmark, home ownership is regarded for tax purposes as producing an 'income' from capital, even though no actual income is involved – one simply has the benefit of living in a property rent-free. The assessed value of the property is used to determine the figure for this income. It is necessary in connection with the calculation of take-up to know how much families actually paid in tax on this 'income' from property. The information about the amount of tax paid cannot be retrieved directly from the income statistics register, but there are figures available for the amount of 'income'. The surplus (or deficit, when interest on loans is deducted) 'income' from property is regarded as a part of income from capital, which forms a part of taxable income. During the period from 1987 to 1992, income from capital was also included in the calculation of income which was subject to a special 6%-tranche of income tax for those with slightly higher incomes.

The tax paid on income from property is calculated on the basis of standard state income tax at 22%, plus local income taxes at the relevant percentages for the

area concerned. For persons subject to the additional 6% tax, an estimate of 3% additional tax paid on income from property has been made. The reason that the figure used is 3% and not 6% is that a deduction is made from capital income in calculating the final taxable figure. Since the information available does not show what proportion of capital income lies above or below the level of this deduction in each case, it has been assumed that tax has been paid on half the figure calculated as home-owner's income from property, i.e. additional tax of 3% of this figure.

Appendix 3. Description of the housing benefit model

This section contains a description of a model for the calculation of potential claimants for housing benefit for pensioners and non-pensioners for the period from 1987 to 1992. The model is set up in such a way that it is possible to calculate whether a given family would be entitled to housing benefit and if so, the amount of benefit to which they would be entitled. The model is almost identical to the housing benefit model described in Hultin (1996), and is constructed on the basis of the relevant regulations concerning housing benefit available to individuals during the period in question, as laid down by in the relevant laws and statutory orders and taking due account of changes in the legislation which took place during the period.¹¹

3.1 The housing benefit model, 1987-1992

The housing benefit payable to individual claimants housing benefit for pensioners and for non-pensioners is calculated in accordance with a large number of common rules. For both groups, the right to housing benefit is dependent on the claimant having permanent residence in Denmark, the claimant having a home in Denmark which is used for year-round residence, and the home containing a kitchen with a built-in water supply.

The two forms of housing benefit differ in terms of who is entitled to claim them.

To be entitled to *housing benefit for pensioners*, applicants must be in receipt of a public old-age pension or an early retirement pension. Benefit can be paid in respect of all types of housing, though for shareholders in private housing co-operatives half the benefit is paid as a grant and half as a loan. For home owners, too, a portion of the benefit is paid as a loan only.

Housing benefit for non-pensioners, on the other hand, is only available to tenants, including members of publicly-owned housing associations, and it is always paid out as a grant. However, this type of housing benefit can be claimed by anyone, regardless of their labour market status. Since it is not possible to claim both forms of housing benefit simultaneously, and since the amount payable as housing benefit for pensioners is normally the higher of the two, the housing benefit for non-pensioners scheme is, in practice, used only by people who are not pensioners.

¹¹ See consolidated Acts of Parliament numbers 670 of 23.09.86, 467 of 01.08.88 and 716 of 25.10.91, and also laws numbers 929 of 19.12.86, 948 of 23.12.86, 379 of 10.06.87, 357 of 01.07.88, 375 of 07.06.89, 249 of 25.03.90, 386 of 13.06.90, 399 of 06.06.91 and 935 of 27.12.91.

Calculation of the level of housing benefit to which individuals are entitled involves a large number of factors. The most important are the income of the household, the level of rent paid, and the number of adults and children in the household. Because the regulations are so highly complex, it has been necessary to make a number of simplifications in order to be able to calculate the level of housing benefit. Consequently, the housing benefit model described below does not provide an exact description of the housing benefit regulations currently in force, but is constructed on the basis of a reasonable approximation of them.

The model is presented in the form of equations, following the example set by the Ministry of Finance (Finansministeriet *et al.* (1995)). However, the actual equations used differ significantly from those suggested by the Ministry of Finance, in that those were based on regulations dating from 1993, whereas in the present case it is the regulations for the period 1987-1992 that form the basis of the model.

The housing benefit model:

- 1) $H_{bnp} = 0.75 * (adjrent - h_{bnp_{thresh}})$
- 2) $H_{bp} = 1.0 * (p_1 * adjrent - h_{bp_{thresh}})$
- 3) $H_{bnp} \leq h_{bnp_{max}}(children)$
- 3a) $H_{bnp} \leq 0.15 * adjrent$, if $children = 0$
- 4) $H_{bp} \leq h_{bp_{max}}(children)$
- 5) $Adjrent = adjrent$ (rent, floorspace norm, floorspace, heating)
- 6) $Adjrent \leq adjrent_{max} * (1 + 0.05 * children)$
- 7) Floor space norm = floor space norm (floor space, residents)
- 8) $H_{bnp_{thresh}} = p_2 * (householdinc < x_1) + p_3 * (householdinc > x_1)$
- 9) $H_{bp_{thresh}} = p_4 * (householdinc < x_1) + p_5 * (householdinc > x_1)$
- 10) $H_{bnp_{thresh}} \geq h_{bnp_{thresh,min}}$
- 11) $H_{bp_{thresh}} \geq h_{bp_{thresh,min}}$
- 12) $Householdinc = householdinc(y, children)$
- 13) $H_{bnp} \geq h_{bnp_{min}}$ otherwise 0
- 14) $H_{bp} \geq h_{bp_{min}}$ otherwise 0

Each equation is discussed in detail below. The calculations in this housing benefit model involve the use of a number of different rates, and these are changed annually through legislation. For the sake of simplicity, the rates in use in 1992 are used in the explanations of the equations of the model. The rates

used in the model were those current for the period 1987 to 1992, and these are given in Appendix Table 3.1 at the end of this appendix.

Equation 1: Annual housing benefit for non-pensioners, DKK (hbnp)

The amount of housing benefit for non-pensioners per annum is calculated as 75% of the difference between the adjusted rent (adjrent) and the housing benefit for non-pensioners threshold amount ($hbnp_{\text{thresh}}$).

Equation 2: Annual housing benefit for pensioners, DKK (hbp)

The amount of housing benefit for pensioners per annum is calculated basically as the difference between the adjusted rent (adjrent) and the housing benefit for pensioners threshold amount (hbp_{thresh}). The value of the adjusted rent decreased under the terms of the legislation from a factor of 1 in 1990 to 0.933 in 1992 in accordance with parameter p_1 in Appendix Table 3.1.

Equations 3, 3a and 4: The maximum annual amount of housing benefit ($hbpnp_{\text{max}}$)

In the case of housing benefit for both pensioners and non-pensioners, the amount payable cannot exceed a given maximum. The level of this maximum annual amount is dependent on the number of children in the family. If the number of children in the family is under four, the amount of housing benefit cannot exceed the amount $hbpnp_{\text{max}}$, which was DKK 24,684 in 1992. If there are more than three children in the family, the maximum amount payable is increased by 25%, i.e. to DKK 30,855.

$$Hbnpnp_{\text{max}} = hbpnp_{\text{max}}, \text{ if children} < 4$$

$$Hbnpnp_{\text{max}} = hbpnp_{\text{max}} * (1.25), \text{ if children} > 3$$

For claimants of housing benefit for non-pensioners who have no children, the housing benefit payable cannot exceed 15% of the adjusted rent (adjrent). In practice, this restriction has a major effect, since payments to beneficiaries of housing benefit for non-pensioners are thus greatly limited in comparison with payments to recipients of housing benefit for pensioners.

For housing benefit calculations, persons under the age of 23 are regarded as children, provided they live at home and do not have children themselves.

Equation 5: Adjusted rent (*adjrent*)

The adjusted rent is the portion of a family's total housing costs towards which a subsidy is available. The concept thus covers housing costs paid by owner-occupiers, tenants and shareholders in co-operative housing associations. The calculation of the adjusted rent depends on the basis on which the home is occupied.

a) Housing costs for tenants and shareholders in co-operative housing associations

For tenants and shareholders in co-operative housing associations, the adjusted rent (*adjrent*) is calculated on the basis of the actual rent per m² of floor space. To this is added a small heating supplement (heating) of DKK 17.0 per m², if the dwelling is heated by electricity, gas or a collective heating system. The adjusted rent is then calculated as the rent per square metre multiplied by the number of square metres of floor space which the dwelling covers.¹² This calculation is shown in the equation below, where 'heatingsup' is a dummy variable indicating whether or not the family is entitled to a heating supplement.

$$Adjrent = cost\ pr\ m^2 * floor\ area,$$

$$where\ cost\ pr\ m^2 = rent/floor\ area + heatingsup * heating$$

For families who first began to receive housing benefit after 1986, and for whom the floor area of the dwelling exceeds a certain limit, the rent is calculated on the basis of a standardised floor area (*standarea*). Standardised floor areas are described below.

$$Adjrent = cost\ pr\ m^2 * standarea,$$

$$where\ cost\ pr\ m^2 = rent/floor\ area + heatingsup * heating$$

During the period from 1987 to 1992, transitional regulations were in force for families for whom the floor area of the dwelling exceeded the standardised area. From 1987 to 1991, 75% (*P₇*) of the costs of the next 20 m² (*standarea2*), and 50% of the costs for the next 20 m² after that (*standarea3*) were thus included in the calculation of housing costs. In 1992 only 57% of the costs for the first additional 20 m² were counted. For families to whom these arrangements applied, the adjusted rent is calculated as follows:

$$Adjrent = cost\ pr\ m^2 * (standarea + 0.57\ standarea2 + 0.50 * standarea3)$$

b) Housing costs for owner-occupiers

¹² In a number of cases, more than one family lives in one dwelling, for example in the cases of a group of students sharing accommodation. In such cases the real rent, floor area and number of rooms are regarded as being apportioned equally between the families in the dwelling.

In the case of owner-occupiers, only a portion of the housing costs are included in the calculation of housing benefit. The costs involved are property tax (proptax), tax on surplus/deficit income from ownership of property (propsurptax) (see Appendix 2), and a standard sum for maintenance (maint), which in 1992 was DKK 6,700. Housing costs for owner-occupiers are thus:

$$\text{Housing costs} = \text{proptax} + \text{maint} + \text{propsurptax}$$

The adjusted rent for owner occupiers is calculated in a similar way to that used for tenants and shareholders in co-operative housing associations on the basis of housing costs and the standardised floor area.

This process is represented in the housing benefit model, except that the proportion of the housing costs for owner-occupiers who only qualify for housing benefit support in the form of loans are not included.

Equation 6: Maximum adjusted rent (adjrent_{\max})

In 1992 the maximum amount allowable for the adjusted rent (adjrent_{\max}) was DKK 46,800. This maximum was further increased by 5% for each child in the family, up to a maximum of four children.

Equation 7: Standardised floor area (standarea)

For families who were already receiving housing benefit prior to 01.01.1987, the standardised area is calculated as one room more than the number of persons in the family. The number of rooms is determined according to the rule that a dwelling of up to and including 60 m² can be regarded as having at most two rooms, dwellings from 61 to 75 m² as having a maximum of three rooms, and dwellings from 76 to 90 m² a maximum of four rooms. The standardised area has an effect on the threshold amount.

For families who started to receive housing benefit after 01.01.1987, the standardised floor area (standarea) is calculated as 65 m² for the first person in the family and 20 m² for each additional person. If the standardised area exceeds the actual area, the actual area is used in calculations. The standardised area is used in the calculation of the adjusted rent.

Thus, for recipients of housing benefit from a date earlier than 1987, dwellings larger than standard are regulated by means of the threshold amount, while for families who started receiving benefit from a later date, dwellings larger than standard are regulated by means of the adjusted rent: see equations 5, 8 and 9.

Equations 8 and 9: Threshold amounts for housing benefit for pensioners and non-pensioners ($hbnp_{thresh}$, hbp_{thresh})

The threshold amount for recipients of housing benefit for non-pensioners is calculated on the basis of the adjusted household income, and is normally equivalent to 15% (p_2) of income below DKK 126,900 (x_1), and 25% (p_3) of the remaining income.

For recipients of housing benefit for pensioners, the threshold amount is calculated in a similar way. However, the proportion of the adjusted household income to be used in the calculation of the threshold amount was scaled down in the years 1991 and 1992; the proportions in 1992 for the two income bands were 11 2/3 % and 21 2/3 % respectively (p_4 and p_5), a little less than for recipients of housing benefit for non-pensioners.

For families who had been in receipt of housing benefit prior to 1987, the figures p_2 , p_3 , p_4 and p_5 are dependent on the number of rooms. If there was one room more than the number of people in the family, the parameter (p_2 1r) is used. If, on the other hand, there were two or three more rooms than family members, the proportion is increased to correspond to (p_2 2r) or (p_2 3r); see Appendix Table 3.1. The same principle applies for p_3 , p_4 and p_5 . The rule is applied only for actual recipients of benefit, c.f. the standardised area.

In cases where more than one family live in the same dwelling, the floor area and the number of rooms of the dwelling are regarded as being distributed equally between the families for the purpose of calculation of the standardised area.

Equations 10 and 11: Minimum threshold amount for housing benefit ($hbnp_{thresh,min}$)

For recipients of both types of housing benefit, the threshold amount cannot be less than a certain minimum ($hbnp_{thresh,min}$): in 1992 this amount was DKK 7,200. This amount can be regarded as the minimum part of the rent payment which a family could reasonably be expected to meet from its own income.

Equation 12: Adjusted household income (Householdinc)

The adjusted household income (householdinc) is calculated as the sum of housing benefit income (y) for all members of the d-family (see Appendix 2), including the income of children under 23 years of age living at home. This income is calculated on the basis of each family member's personal income (earned income, including pensions, unemployment pay and the like) ($persinc$), net income from capital where this is a positive amount ($poscapinc$), and any income sup-

port (incsup). From this amount is deducted an amount ($\text{ded}_{\text{house}}$) of DKK 20,400 for each child in the family (children). Furthermore, children's incomes are only included in the calculations if they exceed a certain amount, in which case this amount ($\text{ded}_{\text{child}}$) is deducted from the child's income. The level of this deduction was DKK 11,700 in 1992. The calculation is shown below; *child* is a dummy variable for whether or not the income is that of a child.

$$\text{Householdinc} = \text{Sum of the household's } (y, \text{poscapinc}) - \text{ded}_{\text{house}} * \text{children}$$

$$y = \text{persinc} + \text{incsup} - \text{child} * \text{ded}_{\text{child}}$$

In addition, transitional regulations were in force for recipients of housing benefit for non-pensioners, because a number of expenses had previously been deductible in the calculation of income when this was based on social income. These expenses included such negative income from capital (i.e. interest on debts) as it had not been possible to offset against the family's positive income from capital (*negcapinc*), plus a range of other deductions: costs of travel to work (*travel*), unemployment insurance payments and union dues (*union*), subsistence allowances (*subsist*) and other costs in connection with one's work (*work*). If these items totalled more than DKK 5,000, they were in part deductible from the remainder of the family's income.

$$\text{Householdinc} = \text{Sum of household's } (y, \text{poscapinc}) - \text{ded}_{\text{house}} * \text{children} - p_6 * \text{transition},$$

where *transition* = *Sum of household's transitional allowance (negcapinc, travel + union + subsist + work) > DKK 5,000.*

The transitional arrangement (p_6) was phased out gradually, so that up until 1989 these items were deductible in full, but by 1992 only 25% of the total amount was included.

Equations 13 and 14: Minimum payment threshold for annual housing benefit payments ($\text{hbpnp}_{\text{min}}$)

The legislation on housing benefit states that there should be a threshold for how small an annual sum can be claimed from public funds. This amount is the same for all recipients of housing benefit (regardless of whether they are claiming housing benefit for pensioners or non-pensioners), and in 1992 it was DKK 828. If housing benefit entitlement is calculated as being below this threshold amount, it is not claimable.

3.2 Simplifications in the housing benefit model

As has already been mentioned, the housing benefit model which has been set up represents a simplification of the relatively complex set of regulations which govern the payment of housing benefit.

Where such simplification has been necessary, this is first and foremost because the detailed information which a 'complete' housing benefit model would require could not be obtained from the accessible data registers. It is also the case that in certain instances, individual municipalities are allowed to exercise their discretion in calculating housing benefit. In addition, there are some regulations which would affect such a tiny group of households that the labour involved in including them in the model would not be justifiable in terms of the difference made to the results.

In the sections below are discussed the simplifications to the model which can be assumed to have the most appreciable effects.

The household

In housing benefit terms, a household consists of the housing benefit claimant, the claimant's partner, children living at home, and other persons living in the dwelling who are not lodgers. This means that the composition of a household in housing benefit terms does not correspond exactly to either a family or a household as defined by Danmarks Statistik. The housing benefit household can consist of fewer persons than the Danmarks Statistik household, because lodgers are not counted. On the other hand, the housing benefit household may contain more individuals than the Danmarks Statistik family (see this chapter, above).

The Danmarks Statistik 'd-family', described in Appendix 2, is used in the model as an approximation of the housing benefit household. However, children living at home and aged over 23 years are reclassified as adults. The same definition has been used previously in the Ministry of Economic Affairs' Law Model calculations for potential claimants. Using the d-family underestimates the number of members of the housing benefit household in the case of there being residents in the household who are neither members of the family nor lodgers. This has an effect both on the calculation of the adjusted rent, where the standardised area is dependent on the number of persons in the household, and on the total household income, where the inaccurate reporting of household membership can create a significant deviation from the correct calculation (see also Appendix 4).

Household income

Danish legislation on housing benefit laid down for 1987 and 1988 that household income was to be calculated on the basis of the social income (a special

indicator for income regulation of benefits) of each member of the household. From 1989 to 1992 household income was calculated as the sum of the personal incomes of each member of the household, plus positive income from capital, plus any social welfare benefits paid out as grants (not as loans as defined in section 9 of the law on social welfare benefits). To each person's income was then added the difference between a calculated yield on wealth and the actual income from wealth, multiplied by a given factor. It was not possible to take into account this addition for 'unrealised yield on wealth' in the housing benefit model. Consequently, the household income for some households will be an underestimate, but the effects of this factor on the calculation of potential housing benefit recipients can be assumed to be very limited.

Another element not included in the housing benefit model calculation of household income is non-repayable social welfare grants made to refugees for clothing, initial furnishing of a home, etc. The effect of this factor can also be taken to be of little significance.

It is normal practice to base housing benefit calculations on income for the year two years previous to that for which benefit is being claimed, with a pro rata addition to take into account wage inflation. If it is expected that income in the year for which benefit is claimed will differ significantly from that two years previous, the expected future income is used instead.¹³

The amount of divergence that should exist between these two levels of income in order for expected future income to be used as the basis for calculating benefit was not laid down in legislation for the period 1987-1992. However, Act 376 of 01.06.1991, which came into force as of 01.01.1993, laid down that the income from two years earlier could be used as the basis for calculating housing benefit if it was not more than DKK 10,000 less or DKK 20,000 more than the expected income for the year for which benefit was claimed. Since income from two years earlier was only used as the basis for calculations if it did not differ significantly from income for the year for which benefit was claimed, the housing benefit model is based on income for the actual year for which benefit is claimable. This avoided calculation errors in those cases where income had altered significantly.

Since the income statistics register does not contain complete information on social income after 1986, household income for 1987 and 1988 is calculated on the same basis as was used for the period 1989-1992, even though the basis for calculation should have been social income. When the transitional regulations are taken into account, the definition of income for housing benefit purposes is

¹³ In practice, expected future income is often used in the cases of new housing benefit claimants.

in fact very similar to the concept of social income. However, it is to be expected that the failure to use social income as the basis for the calculations for 1987 and 1988 will have resulted in these being less exact.

Housing costs for tenants and for shareholders in private co-operative housing associations

For tenants and shareholders in co-operative housing associations, housing costs are calculated as the actual rent (excluding heating), plus a supplement if the tenants have an obligation to contribute to the maintenance of the building. The rent is also increased if the dwelling is heated by electricity, gas or a communal heating system.

Since the building and housing register only contains information about rents for those years in which general property valuations were carried out, it has been necessary to estimate the increases in rents in the intervening years (see Appendix 2). Nor does the building and housing register contain information concerning the degree to which an obligation to contribute to the maintenance of the building affects any given tenant, and consequently that factor has not been included in the housing benefit calculations. The incomplete information concerning rents is clearly one of the largest uncertainty factors in the model. The fact that information on maintenance obligations is lacking must mean that rents are underestimated to some extent.

For dwellings which house more than one family, it has been decided to divide the rent, floor area and number of rooms equally between the families for the purposes of the model. If this were not done, the housing benefit calculations would be based on the income of only one family, while the housing expenses would cover a larger household. In this respect the housing benefit model differs from that used by Hultin (1996).

Housing costs for owner-occupiers

Housing costs for owner-occupiers are calculated as the sum of property taxes, a standard sum for maintenance, and an estimated tax on surplus 'income' from the property. From this figure is deducted estimated tax on deficit income on the property and income from rents. In addition, owner-occupiers can apply to have the following amounts taken into account: 80% of interest payments and repayments of capital on mortgages on the property, and fees paid for the maintenance of roads and drains associated with the property. These last are only taken into account for calculating entitlement to housing benefit for pensioners which is paid as a loan.

In the housing benefit model, it is not possible to include those elements of housing costs which are linked to housing benefit loans for pensioners, since no

information is available regarding mortgage repayments. Housing costs that are associated with the calculation of housing benefit for pensioners in the form of non-repayable grants are however included, though income from rents cannot be included in the calculations. The main problem here is the determination of the assessed value of the land on which the dwelling stands, which, as described in Appendix 2, forms the basis for fixing property taxes.

Floor area of the dwelling

The number of persons in the household is an important factor in calculations related to the floor area of the dwelling, because of the use of standardised areas. This standardised area is increased by 15 m² if one or more of the members of the household has serious mobility difficulties and the dwelling has been adapted for the use of handicapped persons.

The special rules for persons with mobility difficulties are not taken into account in the housing benefit model. This means that the standardised area calculated is in some cases is too small, though it is estimated that in practice this will have only a very small effect on the final calculations.

Nor has there been taken into account in the model the fact that the standardised area is not reduced for existing housing benefit recipients if their partner dies or moves into a nursing home.

Threshold amount for housing benefit for pensioners

If a member of a household dies or moves into a nursing home, this fact is not taken into account for the threshold amount, which remains unchanged. This rule has not been included in the housing benefit model. This omission has implications for people who were beneficiaries of housing benefit for pensioners from before 1987, and in these cases, the threshold limit in the model will be overestimated. This in turn gives rise to a calculation of a lower level of benefit than was in fact the true entitlement. Calculations for actual recipients are not otherwise affected. For potential claimants this omission can be said to be of no consequence, since the calculation of the threshold limit is no longer dependent on the number of persons in the household, and since in any case the calculations for new claimants do not in any way depend on the number of people there were in the household in the years before that in which benefit claims begin.

Housing benefit and urban renewal projects

If a tenant or member of a housing co-operative has to be rehoused in connection with an urban renewal project, conditions for entitlement to housing benefit may be more relaxed for them than would otherwise be the case. This rule has not been taken into account in the housing benefit model, but this cannot be viewed as being of great significance for the calculations.

Housing benefit for pensioners resident in municipal housing for the elderly

There are special rules for pensioners living in municipal housing for the elderly, and these have not been taken into account in the housing benefit model. No information as to whether people are resident in this type of housing is available in the data registers. However, this is viewed as being of little significance for the calculation of potential recipients of housing benefit, since one can safely assume that virtually all residents in this type of housing already claim housing benefit for pensioners. This assumption is based on the fact that residents in this type of housing will be living at close quarters with others who receive housing benefit, and information about such benefit will certainly be passed from one resident to another. Furthermore, rents in this type of housing are normally so high, that many elderly persons would be unable to live there if they did not receive housing benefit.

Summary

In this appendix, the design of a model for the calculation of housing benefit for any individual family has been described. It is based on the regulations that were in force from 1987 to 1992. From this model, it is possible to calculate housing benefit for both non-pensioners and pensioners.

It can be seen from the model that entitlement to housing benefit depends largely on the income and rent for the household in question and the number of persons the household contains. The regulations for claiming housing benefit are different in a number of respects for families who began to claim housing benefit after 1987. This naturally further complicates the legislation covering this area, but in essence the difference is that having a large home in relation to one's needs has the effect of increasing the threshold amount for people who were claimants from before 1987, whereas for people who began claiming housing benefit after 1987, having a similarly over-sized home resulted in a reduction in the amount of the adjusted rent used as the basis for calculating housing benefit entitlement. This change should be understood in the light of the fact that under the old rules, it was possible for a family with a very small income to move into a large and expensive dwelling and have the extra costs paid from public funds in the form of housing benefit.

In the housing benefit model, it has not been possible to take into account all the regulations concerned with housing benefit. The following are among the most important differences between the model and reality. The concept of the household which is used in relation to housing benefit is not completely identical with the concept of the family as used in the housing benefit model; this can be of significance for the calculation of both household income and adjusted rent. Household income, which in 1987 and 1988 should have been calculated on the

basis of social income, is – in the model – regarded as being based on personal income plus income from capital; this fact might have had an effect on the accuracy of the calculations for these two years.

Appendix Table 3.1 Rates used in the housing benefit model¹

Variable	1987	1988	1989	1990	1991	1992
Hbp/np _{max}	21,696	22,476	23,148	23,724	24,204	24,684
Hbp/np _{min}	732	756	780	804	816	828
Hbp _{min} loan	1,296	1,344	1,380	1,416	1,440	1,476
Ded _{child}	10,300	10,700	11,000	11,300	11,500	11,700
Ded _{house}	10,800	11,200	13,400	15,700	18,000	20,400
Hbp/np _{thresh,m} in	6,300	6,500	6,700	6,900	7,000	7,200
Adjrent _{max}	41,100	42,600	43,900	45,000	45,900	46,800
P ₁	1.00	1.00	1.00	1.00	0.967	0.933
P ₂ 1r	0.15	0.15	0.15	0.15	0.15	0.15
2r	0.20	0.20	0.20	0.20	0.20	0.20
3r	0.25	0.25	0.25	0.25	0.25	0.25
P ₃ 1r	0.25	0.25	0.25	0.25	0.25	0.25
2r	0.30	0.30	0.30	0.30	0.30	0.30
3r	0.35	0.35	0.35	0.35	0.35	0.35
P ₄ 1r	0.15	0.15	0.15	0.15	0.133	0.117
2r	0.20	0.20	0.20	0.20	0.183	0.167
3r	0.25	0.25	0.25	0.25	0.233	0.217
P ₅ 1r	0.25	0.25	0.25	0.25	0.233	0.217
2r	0.30	0.30	0.30	0.30	0.283	0.267
3r	0.35	0.35	0.35	0.35	0.333	0.317
P ₆	1.00	1.00	1.00	0.75	0.50	0.25
P ₇	0.75	0.75	0.75	0.75	0.75	0.57
Heat	15.00	15.00	16.00	16.50	16.75	17.00
Maint	5,900	6,100	6,300	6,500	6,600	6,700
x ₁ (DKK 1,000)	111.5	115.5	119.0	122.0	124.4	126.9

Note: 1) Explanations of each of the variables can be found in Appendix 3 above.

Sources: Various acts and consolidated acts, and the legislation data bank at the Ministry of Economic Affairs.

Appendix 4. Checking the housing benefit model

As discussed in Appendix 3, the take-up calculations are characterised by a degree of uncertainty. Appendix 4 looks somewhat more closely at a number of the areas of uncertainty found in the model calculations.

In Appendix 3 it was mentioned that there are a number of reasons why the actual housing benefit for which people are eligible is somewhat different to that calculated by the housing benefit model. This is partly because the model is a simplified version of the complex set of rules that govern the allocation of housing benefit, and partly because some of the information used to calculate housing benefit is either difficult or actually impossible to obtain from the register data.

However, information about families who have received housing benefit in the December of any given year is available from the housing benefit register. This information is in the form of several key figures, and it has been used to attempt to calculate the number of potential recipients of housing benefit. This makes it possible to carry out a check on the housing benefit model by comparing the calculated and the actual values for the actual recipients of housing benefit in the data set. This in turn sheds light on the degree of uncertainty involved in using the model and the general reliability of the figures it produces for take-up.

Such a check on the model is naturally based on the assumption that the ability of the model to calculate housing benefit for the actual recipients also applies to the rest of the population. The validity of this assumption can be partially contested, inasmuch as a number of favourable terms for actual recipients are not included in the model, the reason being that they do not also apply to potential recipients. To give an example: the regulations applying to size of accommodation do not change for actual recipients if a spouse dies or enters a nursing home. This results in a tendency for there to be more errors in the calculations for actual recipients of benefit than for potential recipients. On the other hand, the number of families for which no rental information is available in the Building and Housing Register (BBR) is slightly larger for the potential recipients group, which increases the risk of erroneous calculations for these people.

The following section is based on the most important variables for calculating housing benefit, namely the actual and adjusted rent, and the adjusted housing benefit income. The comparison is not made for all actual recipients, there being a small number who receive housing benefit according to special terms, e.g. in the case of compulsory rehousing in connection with an urban renewal project. As the housing benefit model is designed to deal with 'normal situations', all such special cases are excluded from the analysis.

First, housing benefit for non-pensioners is discussed, and then housing benefit for pensioners.

4.1 Housing benefit for non-pensioners

The following section compares a number of key variables from the housing benefit register for non-pensioners with the corresponding calculated values in the housing benefit model. The comparisons are based upon the average differences in the calculation of rent, adjusted rent, and housing benefit income.

A comparison of the rent calculated by the model and actual monthly rent paid (according to the housing benefit register) by recipients of housing benefit for non-pensioners is shown in Appendix Table 4.1.

The monthly rent calculated by the housing benefit model for all recipients of housing benefit for non-pensioners is subtracted from the actual rent. A positive figure is therefore an indication that the rent has been underestimated when compared to the actual rent detailed in the case file.

Generally speaking, one would expect a certain underestimation of rent for actual recipients. This is because average rates of rent increase are used in the calculations for families with imputed rents. All other things being equal, one would expect that changes in levels of rent would be greater for actual recipients, inasmuch as the right to receive housing benefit is linked to the amount of rent one has to pay. The underestimation might also be due to the fact that rent is adjusted in the housing benefit model in cases where a household comprises several family units. This adjustment has been introduced so as not to calculate housing benefit for *potential* recipients for whom income comes from one family only, whereas the rent in fact affects the entire household; this would lead to an overestimated amount of housing benefit. However, for cases where the correct income and the correct rent are known for actual recipients, this adjustment can lead to the housing benefit model underestimating the amount paid in rent and thus also the amount of housing benefit. In such cases the housing benefit model must be assumed to calculate housing benefit more accurately for potential recipients than for actual recipients.

As can be seen from Appendix Table 4.1, there is reasonable agreement between the actual and the calculated rent for recipients of housing benefit for non-pensioners. On average, the monthly difference does not exceed DKK 300; in percentage terms, the difference lies in the range of 5% to 11%. Not surprisingly, the calculations appear to be most accurate for 1991, the year for which there is rent information for the majority of families, and for the period immediately after 1991. The difference between calculated and actual rent increases from DKK 266 in 1987 to DKK 298 in 1990, and then falls to DKK 250 in 1991

and DKK 206 in 1992. For the cross-sectional data set the difference is DKK 136 in 1992, i.e. slightly lower than that found for the longitudinal data set.

Appendix Table 4.1 Monthly differences between actual and calculated case figures, calculated for December of each year.

	1987	1988	1989	1990	1991	1992	1992t
	-----DKK-----						
Rent	266	275	297	298	250	206	136
Adjusted rent	408	464	499	506	491	432	412
Housing benefit income	-2,815	-3,444	-3,429	-3,471	-3,269	-3,431	-3,102
Housing benefit for non-pensioners	336	440	435	446	350	327	302
Total	3,102	3,693	4,315	4,959	5,770	6,398	4,770

Note: The column '1992t' shows the results obtained on the basis of the cross-sectional data set for 1992.

Source: Own calculations based on data in registers at Danmarks Statistik.

Since actual rent is thus somewhat underestimated in the housing benefit model, this means that, all other things being equal, the amount of housing benefit must also be underestimate (see this appendix, below).

Although housing benefit calculations are to a large extent dependent upon the actual rent calculated, it is in fact the figures for adjusted rent that are finally used in the calculations.

Appendix Table 4.1 shows that, on average, *the actual adjusted rent* is on average DKK 400-500 higher than that calculated, this being due mainly to the calculations made in connection with the adjustment of the rent, and the underestimate of the amount of actual rent, as described above. In the case of recipients of housing benefit for non-pensioners, the fact that an approximation to the actual housing benefit family is used in the model can influence the calculation of the standardised dwelling area; similarly, the omission from the calculations of the rule concerning an addition to the adjusted rent for full or partial duty of maintenance can mean that the adjusted rent is underestimated.

This underestimate of the adjusted rent may mean that the number of potential recipients of housing benefit for non-pensioners is underestimated to a certain extent. However, it should be borne in mind that the housing benefit model can be assumed to calculate the outcome of potential housing benefit cases better than the cases of actual recipients, and that this will tend to counteract this underestimation. Furthermore, since the adjusted rent can be assumed to be underestimated to approximately the same degree throughout the period 1987 to 1992,

the underestimate is unlikely to have any great effect on the calculations of the *changes* in the take-up rate.

As mentioned in Appendix 3, there are a number of elements of uncertainty in the calculations of *the income of the housing benefit family*. First, income is calculated in the housing benefit model in the light of information from the income statistics register for the year in question, while in fact housing benefit income is based upon the family's income of two years earlier. Second, using a 'd-family' as an approximation for the housing benefit household can, in some circumstances, be misleading.

The following section compares calculated housing benefit incomes with information about income found in the housing benefit registers for the month of December in the year in question. An adjusted income is used, inasmuch as it takes into account adjustments in housing benefit income resulting from the number of children in the family unit, etc. Similar adjustments have been made for calculated incomes. In Appendix Table 4.1 the calculated housing benefit incomes for normal recipients of housing benefit for non-pensioners are deducted from the actual incomes extracted from the housing benefit register.

As is clear from the appendix table, the model overestimated actual incomes. A thorough check has been made to discover whether this might be due to a simple error in the modelling of the legislation, but this does not appear to have been the case. Similarly, a check has been made on whether the deviation could be due to an error in dealing with one particular group or groups, e.g. the self-employed, whose income can be expected can fluctuate considerably from year to year. Families with children in which the older children suddenly start to earn significant incomes form another obvious group. The latter example can in fact significantly affect calculations, because the regulations for housing benefit state that, in cases where such a change is beneficial for the family (e.g. if the children earn considerable amounts), children living at home can be 'converted' into lodgers in the housing benefit calculations, which in effect excludes them from the calculations. Attempts were also made to calculate incomes on the basis of actual income from two years earlier for the families in the longitudinal data set.

However, none of the points discussed above appears to have had a systematic effect on the calculations; they can perhaps explain a certain amount of deviation in the results, but do not appear to explain why housing benefit income in the model is so significantly larger than that stated in the housing benefit register.

There are, however, two factors that must be assumed to play a significant role. First, housing benefit calculations take as their starting point the composition of

family units as they actually are on January 1st. However, the information contained in the housing benefit register is based on data for *December* of the same year. However, in the interim eleven months a family unit as defined in the statistical model might well grow larger or smaller. If, for example, a young person leaves home and begins to receive housing benefit, his or her case will be handled by the housing benefit model on the basis of the entire family income, i.e. including the parents' incomes; information in the case file, on the other hand, will be limited to the income of the young person. Similarly, income recorded in the housing benefit register will be lower than that used in the housing benefit model if a couple are divorced in the course of the year, and one of them begins to claim housing benefit. In contrast, one must assume that in some cases where a family's income increases during the course of a year they will not be eligible for housing benefit in December, and therefore will not appear in the calculations for that year. Thus, the differences found in income for actual housing benefit recipients are mostly due to the facts that the time point in the year for which information is taken is different in the housing benefit register and the housing benefit model, and that a selection mechanism is in operation which means that reductions in income because of changes in family composition may be recorded in the housing benefit register, whereas increases in income are unlikely to be so recorded.

In the case of potential recipients of housing benefit, delineation of family composition might be effected equally well on the first of January as on the first of December, and consequently the large variations of income for actual recipients cannot be expected to have any systematic effect on the calculations for the potential group. It is precisely because the turnover is so large for actual recipients of housing benefit for non-pensioners, as described in Chapter 4, that considerable weight can be given to the explanation suggested above.

The second factor is that housing benefit given to new recipients is often based upon expected *future income*; the housing benefit model uses the *actual figures* for the year in question. Families applying for housing benefit for non-pensioners can be expected to have a relatively pessimistic view of their future incomes – otherwise they might well not be applying for housing benefit in the first place. If, however, the family's actual income does improve, the housing benefit income in the case file will be somewhat lower than the calculated income in the housing benefit model. This might also explain why, in the housing benefit model, it is easier to determine income for families that have received housing benefit for non-pensioners for several years than for new recipients (housing benefit for 'old' recipients being calculated on the basis of income from two years earlier).

This overestimation of incomes can mean that the number of potential recipients of housing benefit for non-pensioners is underestimated, though only to a rela-

tively limited extent, since changes in income for actual recipients cannot be expected to be relevant for potential recipients to the same degree. Furthermore, only 15% of housing benefit income is included in the calculations for new recipients of housing benefit for non-pensioners with low incomes, while the percentage is larger for family units with higher incomes (see Appendix 3). This has the effect of increasing the robustness of the housing benefit calculations with respect to errors in income data.

The difference between actual and calculated annual amounts of housing benefit for non-pensioners are also shown in Appendix Table 4.1. The table shows that housing benefit is, on average, underestimated by between DKK 300 and DKK 450 per month for actual recipients, equivalent to an underestimate of between 34% and 53% of the actual amount of housing benefit; this is a difference which must be regarded as being very considerable. The housing benefit model's general underestimation of actual housing benefit for non-pensioners is a consequence of two factors: first, incomes used by the model are higher than those actually used to determine housing benefit; and second, adjusted rent is underestimated.

It must be stressed that only some of the factors discussed in the above comparisons for actual recipients can be expected to apply for potential recipients (see the discussion earlier in this appendix). In all, it must be assumed that the housing benefit model gives a somewhat uncertain and perhaps slightly low estimate of the number of potential recipients of housing benefit for non-pensioners. However, even though the results produced by the housing benefit model must be interpreted with caution, it must be stated that the main conclusions that can be drawn from the analyses are virtually unaffected by this.

4.2 Housing benefit for pensioners in rented accommodation

The following section describes a similar check of the housing benefit model for the actual recipients of housing benefit for pensioners living in rented accommodation. Once again the starting point is actual recipients in the month of December in the years 1987-1992.

Appendix Table 4.2 shows the difference between the monthly rent calculated by the model and the actual rent for recipients of housing benefit for pensioners. The actual figures have been taken from the housing benefit register. For each year in the period, the annual rent calculated by the housing benefit model has been deducted from the actual rent for recipients of housing benefit for pensioners. As was the case with Appendix Table 4.1, a positive result therefore indicates that rent has been underestimated by the housing benefit model in comparison with the actual rent as stated in the case file.

The table shows that rent is slightly underestimated by the housing benefit model – the average monthly rent calculated for 1989 is DKK 141 less than the actual rent, while calculated monthly rent for the cross-sectional data set for 1992 is only DKK 39 lower. This figures are equivalent to between 2% and 7% of the average rent as given in the housing benefit register.

Appendix Table 4.2. Differences between actual and calculated case figures for recipients of housing benefit for pensioners, calculated for December of each year.

	1987	1988	1989	1990	1991	1992	1992t
	----- DKK -----						
Rent	139	135	141	126	101	67	39
Adjusted rent	215	219	225	220	204	191	174
Housing benefit income	-362	-376	-509	-524	-348	-223	-143
Housing benefit for pensioners	264	273	296	290	236	230	213
Total	6,205	6,648	6,936	7,271	7,785	8,107	7,535

Note: The column '1992t' shows the results obtained on the basis of the cross-sectional data set for 1992.

Source: Own calculations based on data in registers at Danmarks Statistik.

The adjusted rent is slightly lower in the housing benefit model compared with the case files. That the rent has been underestimated here can partly be due to the fact that allowance has not been made for a maintenance supplement given if a tenant is partly or wholly responsible for maintaining the property. A second reason is that, as mentioned previously, the housing benefit model does not take into account the fact that the standardised area of the dwelling is not reduced for families already receiving housing benefit if a spouse dies or moves into a nursing home. This factor has no effect on potential recipients of housing benefit for pensioners, inasmuch as they are not of course already receiving housing benefit. This means that the adjusted rent in the housing benefit model is underestimated relatively more for actual than for potential recipients.

Appendix Table 4.2 also shows the difference between actual and calculated housing benefit incomes for normal recipients of housing benefit for pensioners living in rented accommodation. Housing benefit income is overestimated in the housing benefit model by from DKK 100 to DKK 500 a month, equivalent to between 2% and 8% of the average housing benefit income recorded in the housing benefit register. One of the reasons for the greater level of precision when compared to recipients of housing benefit for non-pensioners is that incomes are significantly more stable among recipients of housing benefit for pensioners, while recipients of housing benefit for non-pensioners often have a greatly fluctuating income, for example due to a move from unemployment to full-time employment. Another reason for the greater precision is that the make-

up of the family unit rarely changes as drastically during the course of a year as can be the case with recipients of housing benefit for non-pensioners.

The above-mentioned differences between actual and calculated incomes should also be viewed in the light of the fact that housing benefit legislation requires that changes in a family's income must be of a significant nature before the original basis for assessing housing benefit is revised. Slight deviations in the basis income are therefore to be expected.

The differences between the actual and calculated monthly amounts of housing benefit for pensioners are also shown in Appendix Table 4.2. Housing benefit for pensioners is on average underestimated by between DKK 200 and DKK 300 a year, equivalent to between 15% and 25% of the average level of housing benefit for pensioners. Amounts of housing benefit are thus also underestimated for actual recipients of housing benefit for pensioners, albeit to a lesser degree than was the case for recipients of housing benefit for non-pensioners.

The housing benefit model's general underestimation of amounts paid in housing benefit for actual recipients is, also in the case of housing benefit for pensioners, a consequence of housing benefit incomes used in the model being higher than those in the actual calculations of housing benefit, and of the fact that the adjusted rent is underestimated. One reason for this might be that the housing benefit model does not incorporate the favourable terms for actual recipients of housing benefit for pensioners. This does not mean one can therefore conclude that the amounts are similarly underestimated for potential recipients, since the more favourable regulations for the standardised dwelling area apply only to recipients of housing benefit after a family has been reduced in size.

4.3 Summary

As is made clear by this appendix, calculating take-up is associated with a certain element of inaccuracy, which results in the differences between the actual and calculated housing benefit paid to actual recipients. Generally speaking, however, the accuracy of the calculations for rent must be seen as being fairly satisfactory, especially in the case of recipients of housing benefit for pensioners. The incomes of recipients of housing benefit for non-pensioners are difficult to calculate, and this factor has led to the model overestimating levels of income for this group. The incomes of recipients of housing benefit for pensioners, on the other hand, basically comprise pensions of one sort or another, and are as such easier to determine.

As the model has a tendency to underestimate the amounts of housing benefit paid out, especially in the case of recipients of housing benefit for non-pensioners, the results of the calculations using the model and presented in Chapter 3 must be seen as being no more than a conservative estimate as to the numbers of potential recipients, especially in the case of potential recipients of

housing benefit for non-pensioners. The results reached on the basis of the housing benefit model should therefore be interpreted with a certain amount of caution.

Appendix 5. Results of logistic regressions

The tables produced below show the results of the logistic regressions discussed in Chapter 3, and required when calculations are made for 1987 and 1992.

Appendix Table 5.1 presents the results for single persons who, according to the housing benefit model, are eligible for housing benefit for non-pensioners.

Appendix Table 5.1. Probability of receiving housing benefit for non-pensioners if eligible to do so¹

	1987 ²		1992 ²	
	Estimated		Estimated	
Constant	-1.1383*	(0.3545)	-1.3428*	(0.2951)
Log (calculated housing benefit)	0.9430*	(0.0778)	0.9797*	(0.0696)
Income in DKK'000	0.0036*	(0.0016)	0.0045*	(0.0011)
Age	0.0147*	(0.0041)	0.0162*	(0.0034)
Gender:				
Male (0/1)	-0.2595*	(0.1128)	-0.3076*	(0.0895)
Number of children	0.3394*	(0.0811)	0.1759*	(0.0791)
Occupation:				
Senior management	0.5651	(0.4376)	-0.0364	(0.3466)
Other management	1.2706*	(0.2715)	0.8184*	(0.2373)
Skilled	0.4452	(0.3513)	0.8535*	(0.2778)
Unskilled	0.9441*	(0.2685)	0.7944*	(0.2704)
Other employed	0.9575*	(0.3295)	0.5993*	(0.2652)
No employment category	1.3189*	(0.2611)	1.0144*	(0.2269)
Accommodation:				
Publicly owned housing assoc. (0/1)	-0.5202*	(0.1031)	-0.5578*	(0.0810)
Floor space, square metres	-0.0207*	(0.0024)	-0.0154*	(0.0019)
No income support (0/1)	-0.3333*	(0.1235)	-0.2150*	(0.1076)
Amount paid in to the Supplementary Pension Fund	-0.2642*	(0.1792)	-0.3559*	(0.1375)
Log Likelihood	-1,446		-2,063	
Number of observations	2,623		3,755	

Note: 1) The response variable has a value of 1 if housing benefit for non-pensioners is received, otherwise the value is 0.

2) The asterisk designates that the parameter is significant at the 5 % level for a χ^2 test. Figures in brackets show standard deviation.

Source: Own calculations based on data in registers at Danmarks Statistik.

Appendix Table 5.2 presents the results for single people who, according to the housing benefit model, are eligible for housing benefit for pensioners.

Appendix Table 5.2. Probability of a tenant receiving housing benefit for pensioners if eligible to do so¹

	1987 ²⁾		1992 ²⁾	
	Estimated		Estimated	
Constant	3.0973*	(0.3157)	1.2601*	(0.3532)
Log (calculated housing benefit)	0.8903*	(0.0517)	1.2887*	(0.0678)
Income	0.0149*	(0.0018)	-0.0078*	(0.0014)
Age	-0.0160*	(0.0041)	-0.0120*	(0.0034)
Gender:				
Male (0/1)	-0.3697*	(0.1128)	-0.3628*	(0.1021)
Accommodation:				
Publicly-owned housing assoc. (0/1)	-0.2175*		-0.2595*	(0.0940)
Floor space, square metres	0.0139*	(0.4376)	-0.0099*	(0.0021)
Log Likelihood	-2,067		-1,832	
Number of observations	5,152		5,862	

Notes: 1) The response variable has a value of 1 if housing benefit for pensioners is received, otherwise the value is 0.

2) The asterisk designates that the parameter is significant at the 5 % level for a χ^2 test. Figures in brackets show standard deviation.

Source: Own calculations based on data in registers at Danmarks Statistik.

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