Study no. 11

Do-It-Yourself work in North-western Europe

Maintenance and improvement of homes

Søren Brodersen

The Rockwool Foundation Research Unit

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Linguistic adviser:
Steve Churchill

Address:
The Rockwool Foundation Research Unit
Danmarks Statistik (Statistics Denmark)
Sejrøgade 11
DK-2100 Copenhagen

Telephone +45 39 17 38 32
Fax +45 39 20 52 19

E-mail: hly@rff.dk
Home page www.rff.dk

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Preface

The Rockwool Foundation Research Unit has been carrying out questionnaire-based surveys of the extent of the informal economy in Denmark – i.e. black activities and do-it-yourself (DIY) activities – since the end of the 1980s. The DIY surveys were carried out partly as an integrated part of the Unit's broader analyses of the Danish labour market, including incentive conditions, and partly as independent surveys published in the Unit's newsletters.

In 1998, the Unit had also started on a questionnaire-based survey, using identical questions, of the extent of black activities in Denmark, Sweden, Norway, Great Britain, and Germany, which has just been published as *The Shadow Economy in Germany, Great Britain and Scandinavia*, by Søren Pedersen (2003). It thus seemed obvious to expand this questionnaire with a series of questions on DIY in the same countries. The analyses of the DIY data were carried out by Søren Brodersen, M.Sc. (Econ.), head of department at Statistics Denmark, who has many years' experience in empirical analyses, and who had also carried out the Unit's previous analyses in this area. Søren Brodersen has special interests and production within the fields of household expenditure, DIY work and national accounts, and he was member of the editorial board of the *Review of Income and Wealth* 1983-89.

The results of this work, based on comparable data from the above-mentioned countries, are now presented in book form under the title *Do-It-Yourself work in North-western Europe. Maintenance and improvement of homes*, by Søren Brodersen.

Statistics Denmark has been responsible for the data collection in Denmark in recent years, while the various national Statistical Offices have been used to collect data in Sweden, Norway and Great Britain, namely Statistics Sweden, Statistics Norway and Office of National Statistics (Social Survey Division) respectively. In Germany, Infratest Burke Sozialforschung, a private market research firm with considerable experience in collecting data for social science research, has conducted the interview surveys for the Rockwool Foundation Research Unit.

As in the publication of previous working papers in this series, Statistics Denmark's interview section, and its graphical department and library have provided invaluable help. Many thanks both to Statistics Denmark and its director, Jan Plovsing.

The Unit's Søren Pedersen has helped with parts of the analyses, and one of the Unit's student research assistants, Christian Scheuer, has helped with a number of the calculations and prepared the appendix. Bent Jensen, deputy director of

the Research Unit, has read and commented on the manuscript and also liased with the printers at Statistics Denmark, while Hanne Lykke, the Unit's secretary, has been responsible for the layout of the book.

The study has naturally been carried out by the Research Unit in full scientific independence of both Statistics Denmark and the national market research institutes we have collaborated with in Sweden, Norway, Great Britain and Germany, and in relation to the Rockwool Foundation.

However, despite the generous financial framework, the analyses would have been difficult to carry out without the enormous helpfulness and interest of the Foundation. I owe the Foundation's staff, including its director Poul Erik Pedersen, and not least the Foundation's Board, headed by Tom Kähler, warm thanks for the usual good working relations between the Foundation and the Research Unit.

Copenhagen, May 2003 Gunnar Viby Mogensen

1. Background, scope and methodology

1.1 Introduction

The massive increase in taxation which has accompanied the expansion of the welfare state in OECD countries since the Second World War has resulted, over the last few decades, in an intensification of the debate on areas where production can be separated from the formal, taxed part of the economy, and transferred into an untaxed form of production involving black labour or non-market production within households, e.g. do-it-yourself (DIY) activities.

This debate has been as heated in Denmark as elsewhere. The Danish tax burden, when measured according to usual international practice (total tax revenue, including compulsory social security contributions, as a percentage of gross domestic product, GDP (see OECD, 2002c), reached a high of 51% in 1999. While it has fallen slightly since then, to 49% in 2001, it is still, from an international point of view, very high: 5-10 percentage point above that of most west European countries and approximately 20 percentage point higher than in both the USA and Japan. The Swedish level increased to over 50% from 1997 and onwards, while in Norway it remained fairly stable at around 42% in the same period. Tax levels in Germany and Great Britain were around 37% in 2001, i.e. 12 percentage point lower than the Danish level in that year, according to OECD figures.

This way of measuring the tax burden is open to discussion, of course. For example, there can be a subtle distinction between compulsory state social security contributions, which are thus included in the tax burden, and other social insurance contributions paid to private insurance schemes, which are not. However, the OECD's ratios of taxes compared with GDP is seen as a very robust indicator of the overall tax burden and the potential distortion of relative prices.

The high level of taxation has been used to fund the welfare state's extensive use of transfer incomes and its comprehensive range of either free or modestly-priced public sector services to households. However, this has resulted in a significant distortion of a large number of relative prices, in particular between prices for taxed and untaxed production. This has led to increasing doubts about the ability of market mechanisms to ensure an effective utilization of the factors of production and to ensure a reasonably low level of unemployment.

In Denmark, in order to counteract some of the unwanted effects of such a distortion, state subsidies were introduced in 1993 to encourage households to purchase services in various areas commonly associated with the shadow economy and households' own DIY. More specifically, these financial provisions involved

grants for home maintenance and improvements, together with a number of domestic services such as cleaning, window cleaning, and gardening. The aim of these subsidies was both to stimulate production and employment and to transfer work back from the shadow economy and households' own (unpaid) production to the formal, registered part of the economy. The subsidy for home maintenance and improvements expired after a couple of years.

Not only do countries like Denmark and Sweden have extremely high direct and indirect taxation, but there is also a very narrow spread of wages, or, in international terms, a small difference between high and low wages. This has resulted in both relatively high and rapidly rising marginal rates of taxation on even modest incomes (in Denmark from approximately 51% up to a maximum of 69% in 1993, though these have since fallen to 45% and 63% respectively in 2000), with a considerable number of taxpayers paying the highest rate.

In view of the above, it would therefore be interesting – certainly from a Danish point of view – to determine, first, the extent of unpaid production, and second, the possibilities for transferring some of these activities to normally paid, taxed employment.

In this book, we present the results of six Danish interview-based surveys on DIY home maintenance and improvements and of interview surveys in Sweden, Norway, Great Britain and Germany. The Danish surveys were carried out between 1993 and 2001 and the surveys in the four other countries between 1998 and 2001, all using a core of nearly identical questions on DIY in the respondent's household. All ten surveys were from the Rockwool Foundation Research Unit.

The interested reader might notice that a few values in the present study differs slightly from values in formerly publicised material. The reason is a new (and slightly improved) method of weighting. Regarding the Danish 2001 survey, some difference is also explained by the fact that we originally used a preliminary version of this survey.

1.2 The theoretical background

In simple labour supply models, the supply of labour is seen as being a choice between paid work and leisure (see Viby Mogensen, 1995). Becker (1965), however, includes factors such as untaxed domestic production (including DIY) in the supply function. The supply of labour, in other words, is not merely a choice between leisure time and paid (taxed) work, it is also influenced by the productivity of consumers' non-market household production, including DIY. Or, put another way, does it make most economic sense to work in the paid, but taxed, labour market and purchase services which are subject to VAT and on

which the supplier has to pay income tax, or would the consumer be better off doing such work himself? Taxation is removed from the equation in the latter, and, even at a typically low level of productivity, DIY and other non-market household production make economic sense, also for the highly paid. In Denmark, people have to work 4-5 hours on average to pay for one hour's work by a plumber or carpenter (see Ministeriet for Erhvervspolitisk Samordning. 1993. (The Ministry for Business Policy Co-ordination)).

Gronau (1977) and others point out that DIY activities can in fact be associated with a certain degree of enjoyment and self-satisfaction, which in turn strengthens this aspect of the labour supply. Gronau believes that this should be further studied through interviews. But factors such as the amount of paid work available, and the existence in Denmark and other northwest European countries of a relatively high level of compensation for both insured and uninsured unemployment, can also be assumed to influence the choice between paid work, DIY, and leisure time activities. The extent of DIY can be expected to increase with unemployment and the level of unemployment benefit.

Over the years, researchers have increasingly supplemented official statistics with estimates of DIY and other forms of household production in order to study topics such as long-term economic growth, international comparisons of income, and the distribution of income within a country.

More recently, interest in extending the traditional national accounts statistics for GDP to welfare indicators has led to renewed interest (also in Denmark) in measuring non-market household production (see Rørmose & Møllgaard, 1995; Eurostat, 1999; OECD, 2002a).

1.3 Scope and coverage

Danish and international surveys agree that a large proportion of the total labour supplied by private households is in the form of unpaid work, and that the time spent on this far exceeds paid, but untaxed (undeclared), work, i.e. black activities or outright criminal activities. The black economy is discussed in more detail in Søren Pedersen (2003).

Unpaid labour in the form of DIY can be grouped under *non-market household production*. According to Gronau (1977), the goods and services produced in this category of production all have close market substitutes. In many surveys, this category is further divided into activities which, in addition to household chores, also includes DIY activities (especially repairs and improvements to private vehicles and private homes) (see Smith and Wied-Nebbeling, 1986).

Due to the limited resources available for these surveys, it has not been possible to cover the entire spectrum of unpaid work or DIY activities. In the *Welfare and Incentives* survey from 1993/94, therefore, it was decided to concentrate on those areas of non-market household production which were most closely related to the other parts of the survey.

The two categories chosen then were: DIY in the form of repairs and improvements to first and second homes, and day childcare. Childcare and DIY in second homes were not covered in our later surveys, and are not covered in this book in general. However, results on second homes from 1993/94 are included in section 3.9.

An important element of the *Welfare and Incentives* survey was to test the methodology used by Viby Mogensen (1990) in a Danish survey in 1988. It was also of interest to determine the effects on this form of DIY of attempts by the Danish government, through grants for home improvements, to increase overall production (in the short term) and transfer some of this activity from black or unpaid work to the formal economy.

The main purpose of the survey was thus to shed some light on the supply of unpaid labour with obvious paid substitutes, whether in the framework of the formal economy (invoiced work by a firm) or as non-invoiced work carried out by a person outside the household.

This interest in household labour supply and paid substitutes for household production has been a regular feature of our surveys ever since. All ten surveys included both questions about DIY home maintenance and improvements and about labour supply for underground production, i.e. the black economy (see Søren Pedersen, 2003). The questions on DIY were used as an introduction to the more sensitive questions on black activities. All the surveys reported in this book were carried out by the Rockwool Foundation Research Unit.

1.4 The classification problem

As indicated in the above, repairs and improvements to homes and second homes are regarded as constituting the main part of those unpaid activities usually referred to as DIY. But it also includes repairs and improvements to boats and cars, and many researchers also include gardening. This is not the case in the Danish *Time and Consumption* survey (Viby Mogensen, 1990), which classifies gardening with household chores. However, this survey involved two concepts of DIY: A "narrow" definition, covering the areas mentioned above, and a broader concept of DIY which includes such activities as sewing and knitting, which have previously been (and are still) regarded as typical female activities.

The home repairs and improvements included in this survey fall into Viby Mogensen's narrow band. While it could be argued that a very broad DIY concept should be included, based on all activities that have obvious paid substitutes, such a distortion of the normal understanding of DIY – i.e. of a handyman hammering a nail or sawing a piece of wood – would hardly serve a useful purpose.

1.5 The production boundary in relation to DIY home repairs and maintenance, construction and improvements

National accounts, and with it the measurement of production and value added, are based on the UN's national accounts system (SNA93). The starting point for determining what to include in these measures, and thus also in gross domestic product (GDP), is the production boundary. A general and simple definition would be to include all activity, or production, which results in an exchangeable output. The SNA production boundary is narrower than the general boundary (UN, 1993).

With regard to DIY in the form of home maintenance, repairs and improvements, SNA lists those domestic and personal services specifically excluded when produced and consumed within the household. These include decorating and maintenance of the dwelling occupied by the household, including minor repairs of a kind usually carried out by tenants as well as owners. However, more substantial repairs, e.g. replastering walls or roof repairs, carried out by the owner, are essentially intermediate inputs in the production of housing services. Major DIY renovations or extensions are included within the production boundary as gross fixed capital formation. As mentioned above, however, minor DIY home maintenance and repairs and consumer durables are excluded.

With the exception of housing services, the 1993 SNA includes no values for the production of services by households for own final consumption. This was justified on the following grounds:

- "Limited repercussions on the rest of the economy,
- difficulty in the imputation of monetary values, and
- adverse effects on the usefulness of the accounts for macroeconomic analysis and policy purposes."

OECD (2002a) defines a terminology for activities most likely to be non-observed even if they lie within the SNA production boundary: Underground production, illegal production, production in the informal sector, and household production for own final use. The DIY home maintenance and improvements covered by this book are of the latter type, though some minor repairs and maintenance lie outside the SNA production boundary.

To sum up, DIY home maintenance and improvements can be categorized into three groups:

a) Types of repairs and maintenance typically carried out by both owner-occupiers and tenants.
b) Repairs and maintenance typically only carried out by owner-occupiers/landlords (e.g. outside maintenance).
c) Major repairs, alterations and improvements, together with construction of own house (fixed capital formation).

Activities under a) are definitely outside the production boundary in SNA when the work is done by the household itself in their own home (owned or rented), but, as mentioned above, a broader definition of production would include it as a part of household production (could be carried out by others). Here, materials consumed in the production process is treated as final consumption expenditure.

The value of activities under b) are under all circumstances included in the imputed rent value of own dwelling, since the rent in rental housing, on which the imputed rent value is based, also covers landlords' expenditure on repairs and maintenance. This type of repairs and maintenance, carried out by households who own their own home, must therefore be regarded as being within the production boundary. In any event, this type of work will be included in value added, indirectly measured through the imputed rent value of own dwelling, even though the activity is not shown as output from the construction industry. Here, materials consumption will thus either be shown as intermediate expenditure incurred in the production of housing services or in the production of the construction industry.

Activities under c) are definitely within the production boundary, and in principle are included as part of the activities of the construction industry in the national accounts. Common to the activities mentioned here is that they are both difficult to measure statistically and include in full in the national accounts.

1.6 Methodology

Earlier attempts to measure the extent of DIY have often been indirect, e.g. measuring turnover at DIY stores. Another method is based on the materials and tools used, plus the time spent by the people involved. Studies of the latter type have measured household production, including DIY activities, based on time use surveys or consumer surveys. These studies often measure input costs by wage costs alone, using different substitution patterns between unpaid labour in the home and paid work in the market (Chadeau, 1992). By adding fixed capital consumption, net indirect taxes and intermediate consumption, an estimate of the value of non-market household production is obtained.

A third approach, the output approach, is to impute a money value to some kind of quantitative measure for household production, and then subtract intermediate consumption to arrive at gross value added. This is the approach first used by Pahl (1984) and later modified by Viby Mogensen (1990). These authors used questionnaire surveys to ask about the proportion of DIY compared with work done by firms or others outside the household. The questions on home repairs and improvements used in the 1993/94 survey extend the questions used by Viby Mogensen.

A new element in the 1993/94 survey was that respondents were asked about the cost of minor repairs and maintenance carried out in the home either by a firm or others outside the household. In all later surveys, we also asked about major improvements. This enabled us to make a cautious estimate of a household's non-market household production within the areas mentioned (see chapter 6). This method has been used in all later DIY surveys from the Rockwool Foundation Research Unit reported in this book.

As mentioned above, we use the output approach here to calculate the production value of households' own DIY in the home. However, input-based studies of the extent and value of DIY are by far the most common. Thus, according to Chadeau (1992), the output approach has been used in only a few countries, due to lack of data. Similarly, Lützel (1989) observes that the output approach requires comprehensive data on the services provided and goods produced in households, broken down by type, quality and quantity. A representative survey will thus at best be possible for only a few selected kinds of output. The surveys from the Rockwool Foundation Research Unit have been limited in the latter sense, in that we only cover DIY home maintenance and improvements. On the other hand, our method has allowed us to measure the value of output from DIY household production in a more direct way, by asking households about the relative share of their own production compared with similar kinds of output purchased in the market, thus avoiding the need for detailed questions about type and quantity pointed out by Lützel.

Few surveys have combined the extent of households' DIY with the actual motives for doing it. In this survey, however, we also asked about the reasons for DIY. The answers to these questions should make it easier to evaluate the possibilities for using subsidies or changes in fiscal legislation to transfer unpaid work in the informal part of the economy to paid work in the formal economy. Questions of this type were included in the Danish surveys in 1993/94, 2000 and 2001, and in the German survey in 2001.

The Danish survey from 2001 also included questions about the kind of minor repairs and maintenance or major improvements carried out in respondents' homes within the last 12 months. This type of detailed information is rarely found in DIY studies.

1.7 The questions used

The Rockwool Foundation Research Unit's surveys of DIY activities are unique from an international point of view, in that the same core of questions have been asked in a more or less identical way in 10 (11 if the somewhat differently formulated questions in the 1988 survey are included) interview surveys over an 8-year (13-year) period, from 1993 (1988) to 2001. Six (seven) of the surveys have been carried out in Denmark, and the remaining four in Sweden, Norway, Great Britain and Germany, cf. appendix C.

As in previous Danish surveys, the aim of the 1993/94 survey was to identify precisely who does DIY. Some of the questions included were therefore designed to show the relative division of work between firms, the household itself or other paid or unpaid work, in the following categories: Minor repairs, major home improvements, and work on second homes. Questions on second homes have not been included in the surveys after 1993/94.

These questions were first used in the 1988 survey (see Viby Mogensen, 1990). The questions were more straightforward in all the later surveys, however. Where previously there had been eight possible answer categories, now there were only three. The first group, "invoiced work by a firm", remained unchanged, while the other two, "the household itself" and "non-invoiced work by persons outside the household", covered three and four answer categories respectively from the 1988 survey. This allowed a direct comparison between the first and all later surveys, though it cannot be ruled out that this simplified approach can have affected the results, of course. However, it is not considered to have any significant effect.

To further improve the possibility of comparison between the two sets of results, the analysis of unpaid work in the 1993/94 survey and all later surveys of DIY home maintenance and improvements were limited to answers from persons in the 18-66 age group, i.e. the answers from 15-17-year-olds were omitted from this part of the analysis. The main results of the 1988 survey, which are compared with the later surveys in table 2.1 and figures 2.1-2.4, have been recalculated to cover the same age group (the 1988 survey included respondents in the 18-74 age group).

Error correction and the validation of data are described in section 6.2, and in more detail in appendix D. For a more general description of the samples and the surveys, see Søren Pedersen (2003), table 2.1 and the appendix.

2. Frequency and relative share of DIY home maintenance and improvements

2.1 Frequencies for home maintenance and improvements

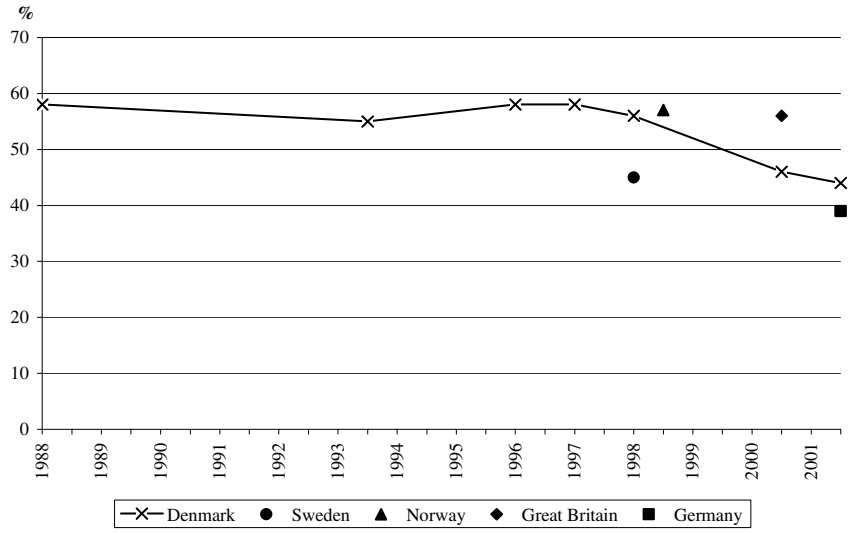
In the five Danish surveys carried out in the 10-year period 1988-98, nearly 60% of respondents said that they had had minor repairs and maintenance carried out as invoiced work by a firm, non-invoiced work by others outside the household, or that they had done the work themselves. This figure fell over the next few years, and by June 2001, only 44% said they had had such work carried out in the last 12 months, cf. figure 2.1. The tendency is different with regard to major improvements. In the surveys from November 2000 and June 2001, 21% said they had had major improvements done, which is higher than in all previous surveys except maybe the one in 1997, where the figure was 20% (figure 2.2).

The answers from the Swedish, Norwegian, English and German respondents were largely similar to those in the Danish surveys. Major improvements were considerably less frequent than minor repairs and maintenance – in these countries, respondents reported major improvements within the last 12 months in 7-15% of the interviews, against frequencies for minor repairs and maintenance of between 39-57%.

There were rather lower frequencies for households' home repairs and maintenance in Germany than in the other countries, which, to some extent, can be attributed to the lower level of owner-occupied homes in Germany, cf. Det Økonomiske Råd (2001). In the countries surveyed, tenants are normally only responsible for indoor maintenance, while all outside maintenance, and anything else needed to keep the property in good running order, is the responsibility of the owner/landlord. Variations in tenants' responsibilities from country to country can affect the result, however. For example, in many cases, Swedish landlords have greater responsibilities regarding indoor maintenance than in the other countries. In line with this, Swedish households also report a relatively lower frequency for minor repairs and maintenance.

The incidence of major home improvements, in the form of renovations, conversions and extensions, can be expected to be greater in economic upswings. As with consumer durables (cars, TVs, white goods, etc.), a booming economy and positive expectations for the future will often be decisive for the realisation of long-held dreams of home improvements, including renovating those parts of the home which have become outdated and shabby. This applies especially to kitchens and bathrooms in many of the homes built during the hectic housing boom at the end of the 1960s and beginning of the 1970s in Denmark (see section 6.4).

Figure 2.1: Have had minor home repairs and maintenance carried out within the last 12 months

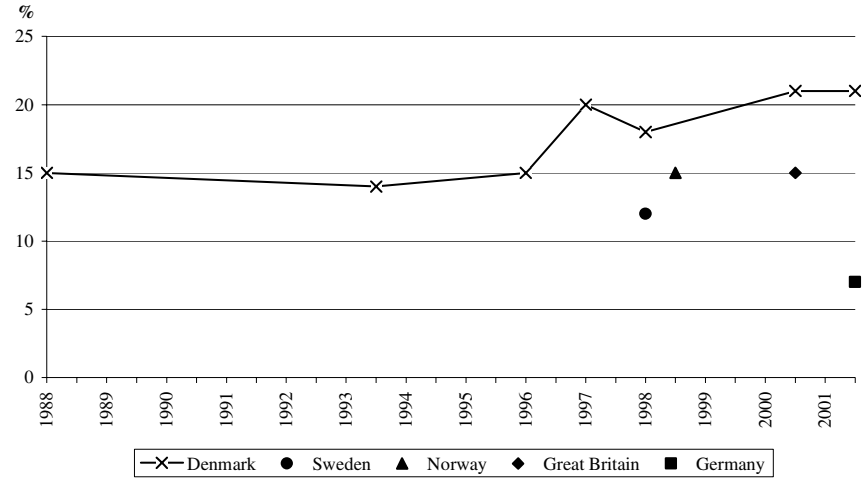


In this light, therefore, it is not surprising that there is still a high level of major home improvements in Denmark in 2000 and 2001. In addition to this, credit terms in the late 1990s were favourable, and interest rates still low, e.g. on mortgage loans, which more and more households are able to obtain as property prices, and with it equity, have risen. Relatively lower growth rates for GDP in Germany point in the opposite direction.

The relatively high proportion of Danes who say that they have had major improvements, etc., carried out within the last 12 months should also be seen in the context of the considerable damage caused by the winter storm in December 1999. The gross fixed capital formation needed to compensate for damage caused by the storm is estimated at about DKK 15 billion (damages paid by insurance companies alone amounted to about DKK 12 billion), and has taken place in the whole of 2000. Thus, both the November 2000 and June 2001 surveys have been influenced by this extraordinary repairs and improvements activity.

Furthermore, given the need to repair storm damage anyway, it is reasonable to assume that many homeowners would take the opportunity to get long-desired improvements carried out at the same time. Due to the pressure on the construction industry of both the storm damage and a relatively favourable economic climate, in many cases insurance companies paid out compensation directly to the households. These could then decide whether they were willing to wait for builders to do the work, or do some – or all – of it themselves.

Figure 2.2: Have had major home improvements carried out within the last 12 months



All in all, this has had a clear effect on major home improvements, while the proportion of households who say they have had minor repairs and maintenance carried out has fallen in the two latest surveys.

The decreasing frequency of minor home repairs and maintenance (in Denmark) could be connected with the high level of major improvements in the second half of the 1990s, in that any minor repairs, might merely have been added to a major renovation project. It would therefore make some of this type of work unnecessary for a time.

The developments outlined above differ for Danish homeowners and tenants in the 13-year period since 1988. Then, about a third of homeowners and half of tenants said that they had had neither minor repairs and maintenance nor major improvements carried out within the last 12 months, cf. table 2.1. In June 2001, a third of homeowners still say this, while the proportion of tenants has risen gradually throughout the period, and now stands at 76%.

This pattern can also be seen in other northwest European countries around the turn of the millennium. As in Denmark, about 2/3 – 3/4 of tenants in Sweden, Norway, Great Britain and Germany, i.e. in all the survey countries, say that they have neither had minor repairs and maintenance nor major improvements carried out in the home within the last 12 months. About 1/3 of homeowners in Sweden, Norway and Great Britain say the same, which is also around the same level as in Denmark.

However, homeowners in Germany differ significantly from those in other countries, nearly half (46%) saying that they have neither had the one nor the other type of work carried out in the home within the last 12 months. This is yet another reason why German frequencies for minor and major work on the home are significantly lower than in the other countries surveyed.

The figures do not necessarily mean that rented accommodation is not maintained to the same degree as owner-occupied housing, however, or that they are increasingly not being maintained or improved at all.

Table 2.1: Proportion of owner-occupiers and tenants who have had neither minor repairs and maintenance nor major improvements carried out within the last 12 months. %

		Owners	Tenants	Total
DK	1988	30	48	37
DK	1993/94	31	53	40
DK	1996	29	48	36
DK	1997	21	57	32
DK	1998	23	64	36
DK	2000	31	71	42
DK	2001	30	76	44
S	1997/98	35	76	50
N	1998	31	67	38
GB	2000	31	67	39
D	2001	46	65	57

Firstly, in all the countries surveyed, outside maintenance is the responsibility of the landlord, and secondly, a lot of indoor maintenance in rented accommodation is financed out of compulsory maintenance accounts. Often, these accounts will be used in connection with moving in/out, so respondents are unlikely to mention such work in our surveys.

At the same time, in the 13-year period concerned, there has been a continuing trend towards the conversion of rented accommodation to co-operative and owner-occupied housing in Denmark. Moreover, minority groups such as the very young and the elderly make up a growing proportion of the remaining group of tenants, i.e. groups which can be assumed to carry out repairs and maintenance to a lesser extent.

2.2 The relative share of DIY in home maintenance and improvements

If we look at the proportion of work done by the household itself, respondents in the last two Danish surveys, in November 2000 and June 2001, say that they

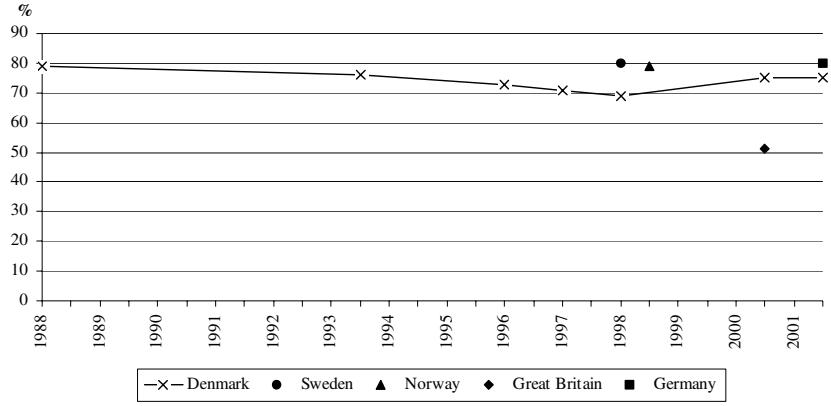
have carried out 75% of minor repairs and maintenance, and 48% and 54% respectively of major improvements themselves, cf. figure 2.3 and 2.4.

There are similar figures for minor repairs and maintenance in Sweden, Norway and Germany, but the DIY share of this kind of work is significantly lower in Great Britain. The same is true for major improvements, though the figure for this type of work is a lot higher, at 69%, in Norway.

The share of DIY home repairs and maintenance is higher in the latest Danish surveys than in the 1997 and 1998 surveys, but around the same level as in surveys carried out in the first half of the 1990s – albeit still lower than in 1988. For major home improvements, the DIY shares reported by Danes in 2000 and 2001 have recovered from the low levels in 1993/94 (at the same time as temporary government subsidies for major maintenance and improvements carried out by firms) and 1998 to the same high level found in earlier years. This tendency has clearly been supported by the development of more DIY-friendly materials and tools, and by the increasing popularity of DIY programmes on TV and in other media. This not only increases the motivation for DIY, but also provides step-by-step information on how to do this type of work.

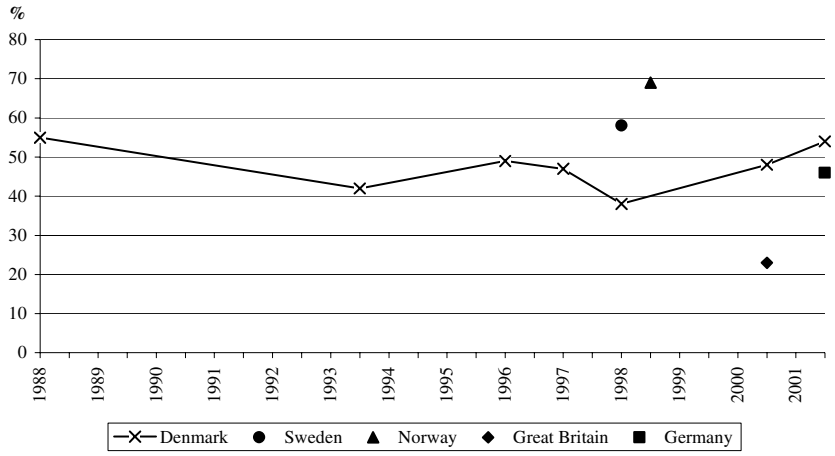
Respondents' answers regarding a growing share of DIY are also corroborated by Statistics Denmark's retail sales index for DIY centres. From 1994 to 2000, the index showed a 66% increase in turnover in current prices, which corresponds roughly to a 50% increase in volume.

Figure 2.3: Share of minor home repairs and maintenance carried out by the household itself



The increase is much higher than for other types of retail outlets, where total retail trade volumes grew by less than 10% in the same period. The increase in DIY activity has thus clearly benefited DIY centres.

Figure 2.4: Share of major home improvements carried out by the household itself



There was a marked tendency towards a greater share for firms in major home improvements in the 1993/94 survey, and thus a lower share of DIY, see figure 2.4 and appendix E. This is presumably due to the existence of special state grants for home maintenance and improvements at the time of the 1993/94 survey. These grants, which, for the period relevant to this survey, covered 50% of labour costs (minus DKK 2000, and with an upper limit of DKK 10,000 per dwelling), were almost exclusively for major home improvements (Ministry of Finance, 1995). This probably explains why the share of this type of work done by firms rose from 35% to 54%, and the share of non-invoiced work fell from 10% to 4% from 1988 to 1993/94. These changes are consistent with both a larger overall volume of major home improvements and alterations and a relative shift away from DIY and black activities. The state grant scheme appears to have enjoyed a certain amount of success in both these areas. This effect of state grants on the volume of black activities in this area has also been found by Søren Pedersen (1995), whose results are based on a supply side analysis of the shadow economy.

2.3 Concluding remarks

From a methodological point of view, it is interesting that the questions in this area gave such comparable answers in successive surveys in Denmark and in four surveys in Sweden, Norway, Germany and Great Britain. In an area which must be seen as being less affected by economic conditions and other events (minor repairs), the pattern of answers is fairly stable, while there is a clearly stronger variation over time and between countries in the pattern of DIY for major improvements. In Denmark in 1993/94, the state grants resulted in a shift

in relative prices to the advantage of invoiced work by a firm, while the winter storm in 1999 created an urgent need for major home improvements in 2000 and 2001.

Frequencies for minor repairs and maintenance are more or less within the same band of variation in the Danish surveys and in the four other northwest European countries surveyed, but for major home improvements we found a much wider spread in the results. The last four Danish surveys show significantly higher frequencies for major home improvements than in the four other countries surveyed. The Research Unit's survey in Germany found an extremely low level of frequencies for major home improvements. Favourable trade cycle movements in Denmark during that period and a depressed German economy probably explain a good deal of the variation.

The results for DIY shares in the four other countries surveyed are remarkably similar to the pattern in the Danish surveys – only Great Britain has a significantly lower level of DIY shares for home repairs and maintenance and major improvements. This was not unexpected, however, given the lower tax burden in Great Britain compared with the Scandinavian countries and the fact that marginal tax rates for most wage earners are the lowest of the five countries surveyed (OECD, 2002b). For Norway, we found an unexpectedly high level of DIY home improvements, which is probably due to the strong tradition for this type of DIY in Norway. This is to some extent supported by the tradition for wooden houses and the fact that the population is spread over a very wide geographical area.

3. Who does DIY?

3.1 The choice of variables

The following presents a cross-sectional analysis of the questions on DIY in the five surveyed countries. The analysis includes the following variables, which are the most commonly used variables in previous Danish and international surveys (see Viby Mogensen, 1990):

- Income.
- Respondent's status in the labour market.
- Type of occupancy.
- Gender, age, marital status and life cycle category.
- Region/degree of urbanization.

The substitution between white or black labour, leisure and DIY is thought to depend on wages, taxation, the cost of working, and DIY productivity. We expect a lower level of DIY with higher income per hour worked (see Gronau, 1977). Geographical differences in hourly wage rates explain the inclusion of geography as a variable.

Other factors, such as time constraints and technical skills (DIY productivity), are thought to explain part of the DIY behaviour. This is why we included respondents' status in the labour market, which also reflects some aspects of occupational skill, in the analysis. Age is also thought to affect DIY productivity.

As mentioned above, homeowners have much more responsibility for repairs and maintenance (tenants are only responsible for indoor maintenance), and regard improvements to the home as an investment which can be realised when the home is sold. Due to restrictions in the labour supply and a supposed difference in the preference for DIY between owner-occupiers and tenants, we expect owner-occupiers to be relatively the most DIY active of the two groups.

3.2 A logistic test

As a supplement to the earlier analyses, we carried out a logistic regression analysis of whether respondents, or rather respondents' households, had carried out minor or major DIY in the home. The response variable was the extent to which the household had or had not carried out DIY in the home in the previous 12 months. However, most other studies of household production and DIY are based on time use surveys, so the response variable in these studies is the time actually spent by the respondent within a specified period, most often a few weeks.

The logistic analysis thus differs from the other analyses described in this book, which focus on the amount of DIY done. This means that the test results presented here cannot be directly transferred to the DIY analyses in other parts of the book, but rather supplement and support the conclusions of these analyses.

The results of the logistic regression analysis are shown in table 3.1.

Table 3.1: Logistic regression of the likelihood of DIY in all countries. 18-74-year-olds[1)]

	Denmark		Norway		Sweden		Germany		Great Britain	
	Minor	Major	Minor	Major	Minor	Major	Minor	Major	Minor	Major
Gender	Unim.	Unim.	Unim.	Unim.	**	Unim.	***	Unim.	**	***
Age	***	***	***	***	**	***	***	***	***	**
Marital status	***	***	***	***	**	*	***	***	**	Unim.
Children under 6[2)]	Unim.	Unim.	Unim.	Unim.	Unim.	Unim.	**	**	Unim.	Unim.
Occupation	***	Unim.	Unim.	Unim.	**	Unim.	***	Unim.	Unim.	Unim.
Education	Unim.	Unim.	Unim.	Unim.	Unim.	Unim.	***	***	Unim.	Unim.
Income[3)]	Unim.	**	*	Unim.	***	**	**	*	Unim.	Unim.
Region	Unim.	Unim.	Unim.	Unim.	*	Unim.	***	***	**	Unim.
Lives in a one family house	***	***	**	Unim.						
Owneroccupied/ tenant	***	***	***	***	***	***	***	***	***	***
Proportion who have carried out DIY	45.6	12.8	49.1	12.5	40.2	8.6	32.9	3.9	35.3	4.3
No. of observations	5,538		1,121		1,947		4,883		1,458	

1) The response variable has the value 1 if the respondent has carried out minor or major DIY within the last 12 months, and the value 0 otherwise.
2) Children under 20 in Sweden and under 4 in Great Britain.
3) The German survey also includes the interviewer's estimate of the respondent's income if the respondent has not stated personal income. This reduces non-response to the income question to just 0.7%.
*** Indicates that the variable is significant at the 1% level.
** Indicates that the variable is significant at the 5% level.
* Indicates that the variable is significant at the 10% level.
Unim. Indicates that the variable is unimportant.
The table summarises the results from appendix tables F1 to F5.

The logistic regression analyses include Denmark, Sweden, Norway, Great Britain and Germany. The Danish analyses are based on the data from six surveys between 1996-2001 as a whole. The results should be interpreted with caution, however, since the questions concern households, whereas our explanatory background variables concern individuals, and the sample consists of representative individuals from the surveys in the three Scandinavian countries, while the samples in Germany and Great Britain consist of households.

In all countries, the logistic regression analysis is based on the 18-74-year-olds, whereas the population is limited to 18-66-year-olds in the analyses presented in the other sections of the book. The Danish survey from 1993/94 was also limited to this age group. The main results of the logistic tests from the 1996-2001 sur-

veys are included in the text below, while the estimation results are shown in appendix F.

For Denmark, as mentioned above, all the omnibus surveys from 1996 and onwards have been combined, i.e. February 1996, February 1997, March and December 1998, November 2000 and June 2001 – six surveys in all, comprising 6126 observations among the 18-74-year-olds (the survey from December 1998 has not been analysed in a DIY context separately).

The variables included in the analyses differ only slightly between the countries. For example, in both Denmark and Norway, there is a variable for whether people live in a one family house or not, while this is not included for the other countries.

With regard to income, in some countries it is included as a continuous variable, while in others it is grouped. This is because, in some countries, respondents could only specify income in pre-determined intervals, whereas in others, e.g. the Danish surveys, respondents could specify their income precisely (in DKK '000)[1].

As can be seen from the notes to table 3.1, the number of children under six is included as an explanatory variable in Denmark, Norway and Germany, while it was necessary to specify different ages in Sweden and Great Britain. We chose children under 20 in Sweden and under 4 in Great Britain.

In the German survey, 19.6% of respondents have not stated their income. In order to reduce the number of "not stated" answers, the interviewer's estimate of the respondent's income, based on other background information, was also included. This reduced the number of "not stated" answers to this variable to just 0.7%.

3.3 Gender and DIY

In Denmark and Norway, there are no significant differences between men's and women's answers about whether their household has carried out minor DIY within the last 12 months. There are in both Sweden, Great Britain and Germany, on the other hand, where men have a statistically certain greater likelihood of answering yes to this question. With regard to major improvements and alterations, only in Great Britain do men specify significantly more DIY than women.

1. Note that for practical reasons it has been necessary to use different measures of income in the various countries.

However, in most studies based on time use surveys or similar sources, there is a strong male dominance in minor repairs and maintenance (see, for example, Flood, Klevmarken & Ståhlberg, 1990; Smith & Wied-Nebbeling, 1986; Merz & Wolff, 1993). Notwithstanding, Flood & Gråsjö (1995) point out that male-female differences have been reduced in both DIY activities and household work during the last decade. Based on Swedish time use studies from 1984 and 1993, they show that men in all age groups spend considerably more of their time on repairs and maintenance than women. It is especially men in the 30-64 age group who spend a lot of time on home repairs and maintenance, while Swedish women in all age groups spend very little time on this activity. On the other hand, women spend a lot of time gardening, albeit not as much as men, who spend more and more time on this DIY activity with age. Kitterød (1994) finds similar differences between the sexes in Norwegian and Swedish families with young children. Time use studies in the two countries in 1990 show that fathers spend about three times as much time on maintenance (which includes gardening, building, renovation and repairs and maintenance, etc.) than mothers. This result applies to all families, irrespective of the children's age.

Based on Danish time use studies in 1987 and 2001, Bonke (2002) finds that women spend significantly less time on DIY than men in both survey years. More surprisingly, he also finds that women spend significantly less time on DIY in 2001 than in 1987. This can be due to the fact that the time use studies use a broad definition of DIY which apparently includes a lot more than home maintenance and improvements.

However, we cannot expect that the results for the factors which determine respondents' time use in the latter studies are completely identical with the results of our surveys, which focus on DIY in the respondent's household.

Moreover, as mentioned above, our surveys in Denmark and the four other northwest European countries cannot directly confirm whether there is a clear statistically significant difference between men's and women's answers about whether they and their household have carried out DIY in the home within the last 12 months, either. To a large extent, this can probably be explained by the fact that our surveys ask specifically about households' overall DIY, and couples should therefore give the same answers.

In order to examine gender-specific differences in our surveys, we must therefore look at single men and women. In the 1993/94 survey, we found that, on average, single women under 45 said that they carried out more or less the same proportion of DIY in the home as single men in the same age group: 4 percentage points higher for minor repairs and maintenance and 4 percentage points lower for major improvements. Single women over 45 gave appreciably lower figures for DIY in the home than men in the same age group, on the other hand: More than 20 percentage points less for both minor repairs and maintenance and

major improvements. This could point to the existence of a generation effect (as opposed to a simple age effect), which would imply that the gender-specific differences in the likelihood of carrying out DIY will decline over time.

We have therefore carried out a logistic test for single women and men in the six Danish surveys combined in the period 1996-2001, and similar tests were carried out for the four surveys in Sweden, Norway, Great Britain and Germany.

The results of this test, which are shown in appendix table F6, do not give a clear picture, however. True, the results now, as opposed to the test which included all the interviewed persons, show that single Norwegian men are clearly significantly more likely to carry out minor home repairs and maintenance than single women, and in Denmark, single men have a slightly significantly (at the 10% level) greater likelihood of having carried out major improvements. At the same time, however, men in both Sweden and Great Britain no longer have a significantly greater likelihood of having carried out minor repairs and maintenance.

3.4 The role of age and marital status

The imbalance in the amount of DIY carried out by the two sexes found in other time use surveys appears, to some extent, to be associated with generation and age. The age variable plays a clear role in our surveys, and is both significant and negative in the logistic regressions, as shown in table 3.1 and appendix table F1-F5.

With regard to age, the likelihood of DIY falls with age in all five countries: The older people get, the less likely they are to carry out minor repairs and maintenance or major improvements in their own home.

These results agree with those of Viby Mogensen from the 1988 survey and Brodersen from the 1993/94 survey.

While the negative age effects found here support earlier Danish and international results, Flood, Klevmarken & Ståhlberg (1990) found a positive age effect in the Swedish time use survey in 1984 for minor home repair and maintenance. Viby Mogensen (1990) reports similar results from a Norwegian study by Lingsom & Ellingsæter from 1983. However, in time use studies number of hours spent on DIY is the response variable, whereas the response variable in our study was the extent to which the household had or had not carried out DIY in the home in the previous 12 month. Both of the methods do not take productivity into account, which we must expect to fall significantly for the higher age groups. In contrast, when calculating the value of DIY work, the present study takes productivity into account by relating the volume of DIY to purchases in the market.

Marital status – here defined as being married or cohabiting, as opposed to being single – is also significant in all five northwest European countries included in our surveys. As with age, the results are identical in all the countries, married/cohabiting respondents being more likely to carry out minor DIY than single respondents. Except for Great Britain (and, in part, also Sweden), marital status also has significant importance for major DIY activities. As with minor DIY, married/cohabiting respondents are more likely to carry our conversions, extensions, renovations and other major DIY projects in the home.

In general, having children does not affect the likelihood of carrying out minor DIY in the home. The exception is Germany, where it makes minor DIY significantly less likely. Also in Germany, having children has a statistically certain effect on major DIY, increasing the likelihood of major home improvements and alterations. In Germany, therefore, this variable has opposite effects on minor DIY and major repairs and improvements.

3.5 Income plays the biggest role in Sweden

Income has no importance for the likelihood of carrying out DIY activities in Great Britain, and the correlation is only statistically certain at the 10% level in Norway for minor DIY. In Denmark, income is significant for major DIY, and in Sweden for both minor and major DIY. In these countries, the likelihood of carrying out minor or major DIY increases with income, while the opposite is true in Germany, where the likelihood of carrying out both minor and major DIY declines with income.[2] In Germany, the income variable for major DIY is almost significant at the 5% level (a significance likelihood of 0.0515).

The rather unclear picture of the importance of income for the likelihood of carrying out DIY agrees with previous Danish surveys. Based on the 1993/94 Danish interview survey, Brodersen (1995b) found that people from medium-income households reported a higher percentage for DIY in minor repairs and major improvements in the home than higher- or lower-income households.

At first glance, this is a surprising result, inasmuch as a higher income could be expected to be directly linked to a higher hourly wage, and thus a greater loss of hourly earnings for each hour spent on DIY. Going from lower to higher income brackets should therefore lead to a greater degree of substitution of DIY by the purchase of services from a firm or third party. It is also in the higher income groups that respondents in jobs without maximum working hours are most likely

[2] An analysis has also been carried out (shown in appendix table F7) where income is included as a grouped variable. For Denmark, this analysis shows that, if income is included as a grouped variable, it becomes significant at the 1% level for minor DIY, while occupation becomes insignificant at the 5% level. The two variables are thus correlated. This is interpreted to mean that the lower people's income, the more likely they are to carry out minor DIY, as we also found for Germany. Other changes have no great importance for the conclusions.

to be found, and where they consequently find it difficult to substitute paid work with time spent on DIY. However, this was only clearly seen in the highest income bracket.

In general, the curves for DIY shares were bell-shaped in the 1993 survey – most clearly for minor repairs. It is therefore not surprising that the logistic regression at the time turned out to be insignificant for income (a test on grouped results was also attempted, but without success).

Similar results were found by Viby Mogensen (1990) in the 1988 survey. However, in a Swedish time use survey from 1984, Flood, Klevmarken & Ståhlberg (1990) found a strong negative effect from income on time spent on minor home repairs and maintenance, though if we exclude the lowest income group, these results are also bell-shaped. It should be remembered, however, that the two types of survey ask questions about different dimensions of DIY, which means that the results are not directly comparable.

The bell-shaped curve for the variation in the share of DIY by household income (especially for minor repairs) is partly due to the fact that a relatively high proportion of households with low income consist of pensioners (early retirement pensioners or respondents with a spouse who is an old-age pensioner). As mentioned above, we have found a strong negative effect of age for both minor and major DIY in all the Danish surveys and in the four other countries surveyed.

3.6 Occupation and education are especially important in Germany

Occupation is important for the likelihood of minor DIY in Denmark, Sweden and Germany, but is not significant in Norway and Great Britain. In Denmark, it is especially white-collar and skilled workers who are more likely to carry out minor DIY compared with unskilled workers, which is the reference group, cf. appendix F. In Sweden, the self-employed are less likely to carry out DIY, while, as in Denmark, skilled workers are more likely to carry out minor repairs and maintenance compared with unskilled workers. Skilled workers are also more likely to carry out minor DIY in Germany, while students are significantly less likely to, compared with unskilled workers.

In general, the respondent's occupation and education has no influence on the likelihood of major DIY activities. Germany is an exception with regard to education, however, since students in particular are more likely to carry out major DIY.

In the Danish 1993/94 survey, which is not included in the logistic tests above, similar results were found for minor repairs and maintenance, with skilled workers and the unemployed in particular doing this type of work. There was a

significant, but negative, coefficient for the self-employed, similar to what we found in the Swedish survey from 1997/98.

In contrast to the results of the analysis of minor repairs and improvements, the unemployed did not differ from other groups with regard to major DIY in the 1993/94 survey. Skilled workers had a significant, positive coefficient for this type of work.

The self-employed are characterised by jobs with no upper limit on working hours, and therefore have long working days and, in many cases, high incomes. As expected, this group reports a low figure for DIY minor repairs. The self-employed had a significant, negative coefficient in the logistic regression analysis in the Danish 1993/94 survey and in the Swedish survey in 1997/98. In contrast, the unemployed, a low-income group with plenty of time to carry out such activities, are characterised by high proportions for DIY minor repairs and maintenance (they had a significant, positive coefficient for minor repairs in the 1993/94 survey). In Germany, students had a positive, but insignificant, coefficient for minor DIY. For major DIY, the coefficient was both positive and significant.

It is especially skilled workers who carry out minor repairs in most of the logistic regressions presented in this chapter, and who carry out major home improvements in the 1993/94 Danish survey. This group combines the highest proportion of DIY with an income that is higher than that for both unskilled workers and the unemployed. There seems to be little doubt that this is due to these workers' training and proficiency in such work. A similar result was found by Viby Mogensen in the 1988 survey.

Thus, having the qualifications for this sort of work appears to explain DIY behaviour more than either jobs with long working hours or income. It is worth noting that a relatively large number of the skilled workers who were interviewed in the survey said that they enjoyed carrying out minor repairs and home improvements (see below). However, under Danish law, DIY carried out by skilled workers within their own occupation is considered as part of the black economy if it is not declared as income (although, in 2002, the Danish parliament – Folketinget – passed a law exempting these activities from taxation. The new law takes effect from 1/1-2003).

Søren Pedersen (2003) shows in chapter 3 that it is precisely skilled workers or people with a vocational education who contribute most to the black economy in Denmark, Sweden, Norway and Germany.

The high proportion of DIY carried out by the unemployed in 1993/94 (significant in the logistic regression for minor repairs) can, to some extent, be explained by the fact that this group also includes large numbers of skilled workers put

out of work by the Danish recession at that time, though having more time to carry out DIY is presumably also a contributory factor.

This result agrees with earlier Danish surveys. Ploug (1990) found that the short-term unemployed spent a relatively large amount of time on DIY activities, and Brodersen (1990) showed that the Danish consumer surveys of 1976 and 1981 revealed a relatively high level of consumption of DIY products by the unemployed and others without work (though excluding pensioners). In a Swedish survey, Flood & Gråsjö (1995) found that unemployed men spent three hours more a week on repairs and maintenance than other males, while unemployed women spent slightly less time on these activities than either employed men or women.

Apart from in Germany, education in itself has no effect on the likelihood of minor DIY. In Germany, people without vocational training are less likely to carry out minor DIY, while people who have gone to technical college ("Fachschule") are more likely to compared with people who have acquired their vocational training in a firm ("Berufliche-betriebliche Ausbildung").

3.7 Regional differences mean most in Germany

There do not appear to be any regional differences in Denmark and Norway, and the correlation is only statistically significant at the 10% in Sweden, where people who live in the country are less likely to carry out minor DIY. In Germany, people who live in the old "Bundesländer" (federal states) are clearly less likely to carry out minor DIY than those in the new "Bundesländer". There are also significant regional differences in Great Britain, where people in southern England and Wales in particular are more likely to carry out minor DIY compared with people in northern England (including Scotland), which is the reference region.

As with minor repairs and maintenance, major home improvements and alterations are significantly more likely to be carried out in the new "Bundesländer" than in the old. There are no regional differences in the likelihood of carrying out major DIY in the other countries.

In earlier Danish surveys, the geographical location of the household and urbanization of the area have been found to influence the amount of DIY carried out by a household. For example, Viby Mogensen (1990) finds that DIY activities decrease with urbanization, though Brodersen (1995b) could not quite confirm this in the 1993/94 survey, which is in line with our later results.

There was no clear pattern for minor repairs, though, as in earlier surveys, the capital had a slightly lower DIY proportion than the rest of the country. On the other hand, geography had a clear effect on the incidence of major DIY home

improvements, with low proportions for this type of work in municipalities in Jutland.

The reason for the low proportion of DIY in Jutland was that a bigger proportion of the work, almost 60%, was carried out as invoiced work by firms. This was approximately 10% higher than in the rest of the country. This can to some extent be explained by geographically-determined wage differentials in the construction industry. In Greater Copenhagen, hourly wages in this sector are nearly 20% higher than in other parts of the country. There are also differences in mileage allowances, etc.

3.8 Home ownership plays a crucial role in all the countries surveyed

Type of accommodation can be expected to influence the amount of DIY, for several reasons. First, in Denmark and the other countries surveyed, the owner of an all-year dwelling is responsible for outside maintenance, while for rented accommodation this is typically the responsibility of the landlord. Second, owner-occupiers have a greater motivation to carry out repairs, and especially improvements, in the home than tenants, who are more likely to lose the value of such work when they move. Third, as a rule, owner-occupied houses are larger than rented accommodation.

A positive effect of homeowner status has previously been found by Smith & Wied-Nebbeling (1986), Viby Mogensen (1990) and Brodersen (1995b).

All the recent surveys of DIY have also included a variable for whether respondents are owner-occupiers or tenants. As expected, this variable is clearly significant in all the countries (Denmark, Sweden, Norway, Great Britain and Germany), i.e. owner-occupiers are significantly more likely to carry out both minor and major DIY than tenants, cf. table 3.1.

This is mainly due to the fact that, in all the surveyed countries, owner-occupiers say they have had minor or major work carried out on the home much more frequently than tenants, cf. appendix table E5. For minor repairs and maintenance, the frequency is typically twice as high for owner-occupiers than tenants, though the Danish survey from 1996 and the German survey from 2001 find rather less difference between the two groups. The differences between owner-occupiers and tenants are even relatively greater for major improvements: 12-28% of owner-occupiers report having carried out major improvements within the last 12 months, against only 2-9% of tenants.

On the whole, more maintenance and improvements is carried out in owner-occupied housing than in rented accommodation. This is confirmed by the results in appendix table E8 and E9. Firstly, the average cost (in the period concerned)

of minor repairs and major improvements was significantly higher for owner-occupiers than tenants.

Secondly, table E4 shows that, compared with tenants, homeowners have an overall tendency to carry out a larger proportion of minor repairs and major improvements on all-year dwellings themselves in Denmark and Great Britain. No significant differences were found for Sweden and Norway, whereas tenants in Germany carried out 12 percentage point more of the minor and major projects in the home as DIY than owner-occupiers.

Overall, the above factors mean that owner-occupiers carry out a far larger amount of DIY than tenants. This can be seen in table 3.2, which shows the total value of DIY carried out on an all-year dwelling by owner-occupiers and tenants respectively. In four of the five northwest European countries, the value of owner-occupiers' DIY is around 10 times higher than that of tenants, and about twice as high in Germany. Apart from the above-mentioned factors, the fact that tenants constitute a considerably higher proportion of households in Germany than in the other countries also plays a role, of course: Approximately 60% of households in Germany are rented, compared with around 40% or less in the other countries, if co-operative housing is regarded as owner-occupied, cf. Det Økonomiske Råd (2001).

Table 3.2: Value of own work in minor repairs and maintenance and major improvements of own home, current prices

Minor repairs and maintenance		Owner-occupiers	Tenants
		---------- Billion ----------	
DK	1993/94 (DKK)	10.0	2.8
S	1997/98 (SEK)	24.1	1.8
N	1998 (NOK)	11.9	1.9
GB	2000 (GBP)	6.1	0.5
D	2001 (DEM)	20.2	11.7
DK	2001 (DKK)	10.4	1.3

Major improvements		Owner-occupiers	Tenants
		---------- Billion ----------	
DK	1993/94 (DKK)	…	…
S	1997/98 (SEK)	18.8	1.2
N	1998 (NOK)	20.2	1.6
GB	2000 (GBP)	6.5	0.0
D	2001 (DEM)	4.7	1.2
DK	2001 (DKK)	26.9	1.4

3.9 Work on second homes

Work on second homes (e.g. weekend cottages, etc.) was included in the 1993/94 survey, but not in our later surveys in Denmark and the four other countries involved. For both categories of work, it was found that ownership of a second home seems to result in a marked fall in the amount of work done by the household on the all-year dwelling: 2-6 percentage point for minor repairs and 4-12 percentage point for major improvements.

In line with these results, the 1993/94 survey showed that owners of second homes who also owned their all-year home carried out 6 percentage point less work on their second home than tenants in all-year housing.

For most people, owning both an all-year dwelling and a second home means an increase in the amount of repairs and renovation that need doing. This group thus tends to reduce the average amount of DIY carried out by households, since, after all, there is a limit to just how much DIY a family can cope with.

Finally, we have tested whether the type of home plays a role, cf. table 3.1. Whether the respondent lives in a house or not (i.e. in a flat, etc.) is only included as an explanatory variable in the Danish and Norwegian surveys. In both Denmark and Norway, people who live in a house are significantly more likely to carry out minor DIY than those who do not. In Denmark, people who live in a house also have a clearly greater likelihood of carrying out major DIY, while in Norway this variable has no certain statistical importance for this type of work.

The clear positive effect on DIY activities in Denmark of living in a house, irrespective of ownership, can probably be attributed to the fact that much of the improvement and maintenance of co-operative flats and owner-occupied flats is carried out by housing co-operatives and homeowners' associations.

3.10 Concluding remarks

We have found that age is a statistically significant factor which affects households' likelihood of carrying out both major and minor DIY in the home. The likelihood of having carried out DIY within the last 12 months falls with age, and previous Danish surveys (Brodersen, 1995b) showed that the extent of work done also falls. This is a clearly significant variable in all our Danish surveys, and in the surveys in Sweden, Norway, Great Britain and Germany.

Whether the respondent was an owner-occupier or not was also a significant variable, those who owned their own homes being the most likely to carry out minor repairs and major improvements themselves. This is clearly the most significant variable in all the countries we have surveyed. We have also shown that

the volume and value of DIY in relation to home repairs and maintenance is much higher for owner-occupiers than for tenants.

Marital status is a third important variable, which is significant in the Danish surveys since 1996, and in Sweden, Norway, Great Britain and Germany. The variable is not significant with regard to major home improvements in Great Britain, however, and the level of significance is lower for Sweden. In the 1993/94 survey, marital status was not significant.

Apart from these three variables, which give significant results in all five northwest European countries, we have found significant results for a number of other variables in several of the countries. For income, we found significant results in all countries except Great Britain, though, apart from Sweden, the level of significance is low. In the Scandinavian countries, there is a positive correlation between income and the likelihood of DIY in the home, while the correlation is inverse in Germany. The latter result was surprising, since we had expected to find the same result in all the surveyed countries as we found in Germany.

We also found that respondents' occupation plays a role in Denmark, Sweden and Germany. It is especially skilled workers and the self-employed who carry out minor home repairs and maintenance. Skilled workers are significantly more likely to carry out this type of work in all three countries, and to carry out major improvements in the Danish survey from 1993/94. On the other hand, the self-employed are significantly less likely to carry out minor DIY than other occupational groups in the latter survey and in Sweden. In Germany, educational level also appears to play a role.

Finally, we found a regional effect in Sweden, Great Britain and Germany – there is a greater likelihood of both minor and major DIY in the home in the new German Länder in particular.

4. Which type of DIY is carried out? Empirical evidence from Denmark

4.1 Scale of DIY projects

For the first time, in the Danish DIY survey from June 2001, we asked households which had answered yes to having had work done on an all-year home within the last 12 months to specify which type of work this involved. The question was open, allowing the respondent to specify an unlimited number of different kinds of work, and was asked about minor repairs and maintenance and major improvements respectively.

In the coding of the open answers, it was possible in only a few cases to distinguish between work carried out by craftsmen and by the household itself. Notwithstanding, in all cases where the work is described merely as bricklaying, carpentry, painting, etc., we can probably assume that much of it has been done by craftsmen. With regard to major improvements, in those cases where only the trade is specified, we do not know whether the work was carried out in connection with, for example, a renovation, conversion or an extension.

It has therefore been necessary to limit the analysis of differences between types of work carried out by a firm (invoiced), the household itself (DIY), or by others (non-invoiced) to those cases where all the work was done by one of the three.

That this analysis is especially relevant to our surveys is due to the importance of the results for assessing the accuracy of our method of valuing DIY. If a clear pattern emerged of households mainly carrying out the less extensive work and leaving the major projects to a firm, then it would result in an overestimation of the macroeconomic values of DIY, cf. section 6.3 on the evaluation of our variant of an output-based method for calculating the total production value of DIY in the home. In addition to this, knowledge about the type of DIY carried out enables us to refine the other analyses of the extent and trend of DIY over time and of those who mainly carry out DIY.

The June 2001 survey involved a total of 797 interviews with persons between 18 and 66. The population was a representative sample of persons in the 16-74 age group, but the DIY analyses focus on the 18-66-year-olds, cf. section 1.6 on the technical background of the Rockwool Foundation Research Unit's DIY surveys. Of these 797 persons, 44%, or 358 persons, said that they had had minor repairs and maintenance carried out within the last 12 months, while 21%, or 171 persons, said that they had had major improvements and alterations carried out. In all, the respondents specified 619 different types of minor repairs and maintenance and 315 different types of major improvements and alterations.

Table 4.1: Incidence of work on the home within the last 12 months, Denmark, June 2001

	100% firm	100% DIY	100% others, non-invoiced	Other combi-nations	Total
	---------- Number ----------				
Minor repairs and maintenance	63	352	9	195	619
Major improvements and alterations	83	99	0	133	315
	---------- %[1] ----------				
Minor repairs and maintenance	10	57	1	32	100
Major improvements and alterations	26	31	0	42	100

1) Due to rounding, the sum of percentages can be different from 100.

Work carried out as 100% DIY accounts for 57% of minor repairs and maintenance, while work carried out 100% by a firm, or as combinations of firm and DIY, account for considerably lower shares.

The reverse is true for major improvements and alterations, where the share of work carried out 100% by a firm, or as combinations of firm and DIY, is considerably higher, while the DIY share, at 31%, is considerably lower. The combination of firm, DIY, and others outside the household is now the biggest category, accounting for 42% of work carried out. This could be due to the fact that major projects typically call for different craft skills, and often involves types of work which require special tools or specialist knowledge, e.g. much electrical and plumbing work. This is also supported by the following analysis.

4.2 Types of work carried out on all-year homes

Over half of all minor home repairs and maintenance, but only a third of major improvements and extensions, is 100% DIY. There is therefore a marked difference in the need for craftsmen at all, depending on the type of work involved. But, within these two major categories of work, is there also a difference between what people leave to a firm and what they do themselves? This is shown in tables 4.2 and 4.3, which present the results of the June 2001 survey.

Among households which say they have done all minor repairs and maintenance themselves, in two out of three cases the type of work done is painting, cf. table 4.2. For repairs and maintenance carried out 100% by a firm, on the other hand, painting only accounts for one in five cases. A large proportion of the work done by firms typically requires special tools and is subject to strict safety requirements. About 40% of the work which households get firms to do consists of re-

pairs to domestic appliances, electrical and plumbing work, boiler repairs, etc. This type of work constitutes only 5% of the work in households which do everything themselves.

More than 20% of major improvements consists of the category "new roof, ceilings, cupboards and carpentry", which is the most frequent type of work irrespective of who does it. The fact that this group is relatively big is probably connected with major repairs needed after the winter storm in December 1999, which some respondents confirm directly.

Table 4.2: Incidence of various types of minor repairs and maintenance carried out in the home within the last 12 months, Denmark, June 2001

	100% firm		100% DIY		100% others, non-invoiced		Other combinations	
	%[1)]	No.	%[1)]	No.	%[1)]	No.	%[1)]	No.
Painting and wallpapering	21	13	63	222	67	6	38	75
Floor planing, repairs to windows and doors	10	6	7	23	0	0	13	25
Bricklaying and wall repairs	3	2	6	22	0	0	7	13
Renovation, kitchen and bathroom, etc.	6	4	7	23	0	0	9	17
Repairs to white goods, electrical work	10	6	0	1	11	1	4	7
Repairs to roof, ceilings, cupboards, carpentry	14	9	10	36	11	1	8	15
Plumbing and heating, boiler, wood stove	29	18	5	18	11	1	17	34
Laying tiles, other and not stated	8	5	2	7	0	0	5	9
Total	100	63	100	352	100	9	100	195

1) Due to rounding, the sum of percentages can be different from 100.

Table 4.3: Incidence of various types of major improvements carried out in the home within the last 12 months, Denmark, June 2001

	100% firm		100% DIY		Other combinations	
	%[1)]	No.	%[1)]	No.	%[1)]	No.
Painting and wallpapering	10	8	8	8	9	12
Floor planing, window and door repairs	12	10	12	12	10	13
Bricklaying and wall repairs	7	6	9	9	7	9
New kitchen, repairs	6	5	13	13	9	12
New bath, repairs	11	9	4	4	10	13
Renovation and modernizing, besides	12	10	5	5	10	13
Rebuilding and extension	6	5	14	14	8	10
New roof, ceiling, cupboards, carpentry	23	19	21	21	20	26
Heat, water and sanitation, boiler, wood stove	10	8	5	5	9	12
Electrical work, tiles, other not stated	4	3	8	8	10	13
Total	100	83	100	99	100	133

Note: There are no reported cases of 100% "non-invoiced work by others".

1) Due to rounding, the sum of percentages can be different from 100.

Among those who leave all the work to a firm, much of it involves such major improvements as new bathrooms, plumbing/heating/sanitation, new boilers, etc., cf. Table 4.3. Among those who do everything themselves, on the other hand, there is a relatively high frequency of the categories new kitchen and conversions and extensions, while renovation is relatively more frequent among work done by a firm. Thus, there is no relative predominance of work carried out 100% by a firm among the biggest major improvements, which might have resulted in an overestimation of DIY based on payment for invoiced work by firms.

The above is to some extent confirmed by a Danish survey from 1995, carried out by European Construction Research (1995), where the annex, written by AIM/Nielsen, shows results from a survey over four quarters, from the fourth quarter in 1994 to the third quarter in 1995. At the beginning of each quarter, about 1000 Danish families were asked whether they were contemplating a modernization or renovation of their homes over the next three months.

About 70% of those interviewed said that they were not contemplating either modernization or renovation. Of the remaining 30%, 65% said they were thinking about painting, and that 8 out of 10 would do it themselves. By comparison, in our survey in 2001, 70% of painting in connection with home maintenance was carried out 100% as DIY. European Construction Research (1995) also finds large DIY shares for work on walls/ceilings, flooring, kitchens, windows and doors, while electrical installations, plumbing and heating, and bricklaying had considerably lower DIY shares (less than 50%). This pattern is also similar to the findings of the Research Unit's 2001 survey.

The European Construction Research survey also found that the likelihood of contemplated renovation/modernization increased with urbanisation, and, in addition, with household size: Only about 20% of single persons were contemplating renovation/modernization within the next three months, as opposed to about 40% of households of four persons or more.

4.3 Concluding remarks

The latest Danish survey of DIY from 2001 included, for the first time in the Research Unit's series of surveys, questions on the type of work involved in those households which had had either minor repairs and maintenance or major improvements and extensions carried out within the last 12 months.

In the case of minor repairs and maintenance, painting and wallpapering is by far the most common type of DIY activity, accounting for 63% of the 352 cases where households say they have done this type of work themselves 100%. In those cases where a firm has done all the work, painting accounts for only 21% of the cases. The high figure for DIY probably reflects the fact that painting

neither requires special knowledge nor expensive tools – whether the quality matches that of a professional painter is another matter, of course.

This preference for work which does not appear to require much in the way of specialist qualifications is to some extent reflected in the type of major projects which the household chooses to carry out entirely by itself. Typically, this includes fitting a new kitchen, new ceiling, cupboards and other carpentry, but households also carry out conversions and extensions largely by themselves. On the other hand, they typically leave decidedly specialist work, such as new bathrooms, plumbing and heating, new boilers, etc., to a firm. Thus, it is mainly work which requires expensive special tools or specialist knowledge which households avoid doing as DIY. It does not seem to be the actual *scale* of the work which determines whether or not it is carried out as DIY, therefore – a result which is important for the reliability of our method of calculating the economic macro value of DIY, see section 6.3 on validation of the method.

5. Motivation for DIY

5.1 An illustrative example

As soon as he has finished his last operation on a Friday afternoon, the surgeon puts his scalpel down, rushes from the operating theatre, past the office where they keep the list of patients waiting for hip replacement surgery, and out to his car. He then drives to the local DIY centre, timber yard, paint shop, etc., before they close to get everything he needs to carry out the much-needed repairs to the house the family bought after their first child was born.

It is not because he is really looking forward to a weekend of DIY, but some quick calculations have convinced him that it is economically rational to do it himself.

He had got an offer from a firm, which charged DKK 284 per hour, excluding VAT, i.e. a total of DKK 355 per hour.

The firm estimated that it would take about 8 hours to do the job, which means that labour costs would be DKK 2840, including VAT. He had been offered overtime at the hospital at DKK 311 an hour, but after paying marginal tax this would only leave him with DKK 114. He would therefore have to work 25 hours' overtime just to pay the building firm to do 8 hours' work. Alternatively, if he had chosen to work fewer normal working hours instead of working overtime, he would have had 37 hours to do the work. This corresponds well to a similar concrete Swedish example, and agrees even with the situation 10 years earlier described in "Erhvervsredegørelse 1993" (Business Review) from the Ministry of Business Policy Co-ordination, which estimated that an average wage earner had to work 4-5 hours to pay for 1 hour's house repairs.

Even though our surgeon could not do the work as quickly (or perhaps as well!) as a craftsman, he nevertheless thought he could do it in 16 hours – or twice as long as the craftsman needed. But doing the job himself would still give him 9 hours' more leisure time than working overtime at the hospital and paying a firm to do it. And if he had chosen to work fewer normal working hours, he would have had 21 hours' extra leisure time and been just as well off financially as if he had paid the firm out of his normal salary (disregarding earned pension rights).

The above example reflects concrete wages and marginal tax rates in Denmark. According to OECD (2002b), marginal tax is at the same level in Sweden, while it is slightly lower in Norway. In both Germany and Great Britain, however, marginal tax is considerably lower for many income groups. An experienced

hospital doctor in the latter two countries would only have to work about 2-4 hours to pay for one craftsman-hour – properly with GB in the lower end of this interval (depending on precise position and which type of craftsman actually demanded). Scandinavian would typically have to work 1-2 hours more than their colleges from Great Britain and Germany to pay for a one hour job by a craftsman in home maintenance or improvement.

The example is fictitious, of course, but illustrates quite well why so many people carry out DIY, and why, from a societal point of view, it is not inconsequential. Scarce labour, which society has invested a lot of time and money in, is being used for work which others, who are perhaps also unemployed, could do both quicker and better.

In economic terminology, there has been a distortion of market incentives, which results in the non-optimal allocation of resources, i.e. they are not being used the most efficiently.

But none of this would matter if the surgeon in our example repaired and maintained the family home first and foremost because he liked doing this type of work in his leisure time. Unfortunately, this is rarely the main motivation for DIY, something which we return to below.

However, it should also be mentioned here that, in many cases, DIY is the cheapest solution – also from a societal point of view. No matter how small the job, it nonetheless requires the transportation of craftsmen to and from the workplace, separate billing, etc. This is part of the reason why it can cost DKK 500 to mend a dripping tap, even though it only takes five minutes and the gasket costs less than DKK 1. Moreover, a lot of work requires several types of craftsmen, and can thus in some cases mean a disproportionate amount of transport time, etc., adding greatly to the cost.

5.2 Questions used and number of observations

An initiative included in the 1993/94 survey for Denmark, and repeated in the interviews for Denmark in 2000 and 2001 and Germany in 2001, was to ask people what motivated them to carry out DIY (in the 1993/94 survey, these questions were only asked in relation to minor repairs and maintenance). Respondents who had answered yes to carrying out such work were given the choice of four categories of motivation for minor repairs and major improvements respectively. These were: Enjoy doing this sort of work; mainly to save money; a combination of the two; other reasons. In the German interviews, the category “a combination of the two” was replaced by two categories: Mainly because you think you can do the work quicker and better yourself; several reasons are equally important. This might also have influenced the answers to the other categories.

There were 1898 observations on DIY in the 1993/94 survey, compared with 429 and 384 in the 2000 and 2001 surveys respectively. There were 1603 interviews on DIY in the German survey where households actually had carried out DIY work in the home within the last 12 months.

5.3 Motivation for DIY: Mainly to save money

The main motive for "minor repairs and improvements" was financial in all four surveys. Irrespective of category, around 80% of those asked gave the financial aspect as a reason. For Germany, the category "several reasons are equally important" has been included here.

Of those who answered the question on DIY, only about 20% said that enjoying repairing and maintaining their own homes was the main motivation (see table 5.1). For Germany, the category "mainly because you think you can do the work quicker and better yourself", has been included here.

Any attempt to shift this work, by means of state grants or tax cuts, from being done as DIY to invoiced work by firms would have to focus on this 80% - the 20% whose main motive is enjoyment are not going to change their ways under any circumstances.

Table 5.1: Motivation for DIY home repairs, maintenance and improvements

		Mainly or partly to save money	Mainly because they enjoy carrying out repairs and maintenance	Other reasons
Minor repairs and maintenance:		---------- %[1] ----------		
DK	1993/94	83	17	1
DK	2000	78	20	2
DK	2001	85	15	1
D	2001	75[2]	24[3]	2
Major improvements[4]:		---------- % ----------		
DK	2000	86	11	3
DK	2001	87	12	1
D	2001	84[2]	13[3]	3

1) Due to rounding, the sum of percentages can be different from 100.
2) "Several reasons equally important" is included here.
3) "Mainly because they think they can do the work quicker or better themselves" is included here.
4) The motivation to carry out major home improvements was not included among the questions in the 1993/94 survey.

It is even more clear that the financial motive is the main driving force behind DIY major improvements – big projects which take a long time to complete usually end up taking all the fun out of work long before they are finished. Table 5.1 shows that around 85% of respondents give financial motives for this type of DIY. The pattern is very similar in the three surveys where this question has been asked about major improvements.

Similar results are reported by Cécora (1991) in a small German survey, where participants were asked to give the three most important reasons for carrying out DIY. 75% said that "they could not afford the high prices in the market" or that "it helped to save money", 55% said it was to "take advantage of own knowledge and skills", 39% that it was "just for the fun of it", and 25% that they "had to do the job quickly" or "commercial infrastructure too far away". It should be borne in mind, however, that rural households were strongly overrepresented in this survey, which might explain the relatively high figure for the fourth category.

Similar results were found by Wunderink-van Veen (1993) in a small Dutch survey of 377 homeowners in 1987, which ranked the motives for carrying out DIY home repairs and maintenance. Of those who gave a main motive, 65% said it was "cheaper".

Flood, Klevmarken & Ståhlberg (1990) compare 1984 data from Sweden with US data from 1975 and 1981. In all three surveys, the respondents were asked to rank their pleasure from various activities on a scale of 0 to 10. In all the surveys, respondents preferred most other activities to home repairs and maintenance. Even time spent at work scores much higher on the satisfaction scale. Of the nine activities included, only cleaning scored lower than DIY.

In the Swedish survey, it was also found that people tended to spend more time on activities with a higher score.

Table 5.2 shows that there is also a connection between motivation and the share of repairs, etc., a household carries out itself in the Danish surveys from the Rockwool Foundation Research Unit. In households that had carried out minor repairs and/or major improvements in the home (either partly or entirely), there was a positive correlation between the proportion of work done by the household and the motivation for doing it. There was a difference of 4-12 percentage point in the DIY element of minor repairs and maintenance between those whose main reason was to save money and those who mainly did it because they enjoyed this type of work. For major improvements, the difference was 7-18 percentage point.

There is a similar pattern for major improvements in our German survey, but not for minor repairs and maintenance. However, the German survey is not strictly

comparable to the Danish surveys on this point, since the questions were formulated differently, one question being split into two.

Table 5.2: DIY shares for households which have carried out repairs, maintenance or improvements themselves, by motivation

		Mainly to save money	Mainly because they like carrying out repairs and maintenance	A combination of both	Other reasons
Minor repairs and maintenance:		---------- % ----------			
DK	1993/94	87	91	90	90
DK	2000	81	93	85	86
DK	2001	79	89	89	100
D	2001	96	94[1)]	94[2)]	90
Major improvements[3)]:		---------- % ----------			
DK	2000	56	63	62	72
DK	2001	49	67	72	100
D	2001	85	96[1)]	60[2)]	79

1) Including persons who say "mainly because they think they can do the work quicker or better themselves".

2) "Several reasons equally important" is included here for Germany.

3) The motivation to carry out major home improvements was not included among the questions in the 1993/94 survey.

If we wanted to influence such behavioural patterns, it would therefore be interesting to know which types of household enjoy carrying out DIY.

The sample size of the 1993/94 survey was sufficient to analyse this question for minor repairs and maintenance (see Brodersen, 1995b). While there was no great variation between groups of households, some groups are worth singling out. Only 9% of single women over 45 who carried out this type of DIY said that they did it mainly because they enjoyed it. The highest status group in the labour market, the self-employed, managerial staff and academics, also had low scores on this question (11-15%). Those who enjoyed carrying out minor repairs and maintenance most appeared to be the long-term unemployed. Of this group, 26% said that enjoyment was their main motivation. Households without children also had fairly high scores (20-21%), whereas skilled workers (18%) are close to the average of 17%.

To sum up, the true DIY enthusiasts, who are not sensitive to changes in economic incentives, are most likely to be found among the long-term unemployed and families without children. On the other hand, the highest status groups in the labour market are the most likely to be tempted by economic incentives, and it is also these who have the best means to do so.

Based on a small Dutch survey, Wunderink-van Veen (1993) showed that people who carry out DIY are not as efficient as skilled craftsmen. Households gave information on the time spent on maintenance and renovation of their homes, and the money they saved by doing this work themselves. Based on this information, a relation was estimated between the time needed to do the work by craftsmen and the household respectively. For example, a job that would take a household 75 hours would only take a craftsman 23 hours. For small jobs taking 50 hours or less, the estimated difference between the time needed by the two types of labour was smaller.

From questions about the maximum price households would be willing to pay to let a craftsman do the job, Wunderink-van Veen found that, for average households, this would require a drop in craftsmens' wages of more than 60%. DIY enthusiasts would require an even larger wage drop. It was concluded from this that most households would not give up their DIY activities easily.

In terms of the example at the beginning of this chapter, a 60% reduction in craftsmens' wages would mean that our surgeon needed to work less than 1 1/2 hours' overtime at the hospital to pay for one craftsman-hour. Given such a price relation, he would probably drop a lot of the DIY work and buy the services of a firm instead – not least considering the much greater efficiency of the craftsmen in doing the work the surgeon would otherwise have done himself.

5.4 Concluding remarks

In the three Danish surveys from 1993/94, 2000 and 2001, plus the German survey from 2001, respondents who said that their household had carried out DIY were asked about their motives for doing so, the main emphasis being on economic motives. In both the Danish and German surveys, 75-87% of those asked said that it was mainly or partly to save money, while less than 25% said it was mainly because they enjoy doing this type of work. Only around 10% said that they carried out major home improvements as DIY because they enjoyed it.

Those Danes who give enjoyment as the main motive for carrying out DIY also do a greater part of the work themselves – around 90% of the minor DIY and 65% of major improvements, compared with about 80% and 50% respectively for households whose main motive is to save money. The German questions are not fully comparable with the Danish questions, but reveal by and large a similar pattern.

The results agree with a number of other surveys from European countries and the USA, which show both that economic motives play a large part in this context and that DIY is not rated as highly as other activities, but also that there is a tendency to spend more time on activities that are rated highly. This is hardly a surprising result in light of the fact that a very large proportion of the workforce

in northwest European countries have to work 3-5 hours just to pay for one hour's invoiced work from a firm.

According to a Dutch study, there would have to be an extremely big change in relative prices in this context to make larger numbers of households switch from DIY to paying a firm to carry out home maintenance and improvements.

6. Macro calculations and comparisons with other sources

6.1 The value of DIY and total home repairs and improvements

The previous chapter dealt with those who carried out DIY and people's attitudes to these activities. It is important to understand these behavioural patterns if they are to be shifted in the desired direction. At the same time, policymakers need to know the total economic extent of these activities in order to evaluate the socioeconomic consequences of introducing such a policy.

In order to put DIY activities in a socioeconomic context, we estimated the total value of these activities, based on the aforementioned interview surveys. We asked those respondents who said that they had had minor repairs or major improvements carried out by VAT-registered firms about the cost of this work. By combining this information with the firm and DIY proportions and non-invoiced work by others, we were able to calculate the value of both DIY and non-invoiced work by others, as in previous surveys from the Rockwool Foundation Research Unit (see, for example, Brodersen, 1995b). The following section presents the method used to calculate the extent of minor home repairs and major improvements.

6.2 The method used

Our approach can be seen as an attempt to answer the question: "How much would it have cost if the DIY and non-invoiced work done by others had been carried out as invoiced work by a firm?". It is assumed that those asked have based their answers on the actual cost of the minor repairs and major improvements, and estimated the value of the work at the same level of prices, no matter who carried it out (see appendix table E2 and figures 2.3 and 2.4). If, instead, the question had been about the amount of time spent doing the work, it must be assumed that we would have found a different relative size for these three categories.

Our starting point was the amount paid by respondents in our surveys to firms during the previous 12 months. Respondents were divided into tenants and owner-occupiers. We then calculated an average expenditure on minor repairs and major improvements carried out by firms for each of these two groups, which, using the comparative method, enabled us to estimate the value of the two groups' DIY and non-invoiced work by others outside the household (see appendix table E8 and E9). We assume that the average value of 1% home maintenance or improvements carried out as invoiced work by a firm is directly comparable in value to 1% DIY carried out by the household for each of the two

categories “minor repairs or maintenance” and “major improvements or extensions”.

We have corrected for non-response and for households with several potential respondents, i.e. for the fact that households with several persons over the age of 17 are more likely to be selected. We also corrected for incomplete or implausible answers, as described in depth in appendix D for some of the latter surveys.

Finally, we assumed that people in the 67-74 age group, who were not included in this part of the survey, had less work done (67%) and those above this age no work done at all.

The final calculation gave a total estimate for invoiced work by a firm for all households in Denmark, Sweden, Norway, Great Britain and Germany, as can be seen in the first row in tables 6.3 and 6.4. Using the comparative method (as in our previous surveys), we then transferred these figures to DIY and non-invoiced work by others outside the household (including black activities). This was calculated for all households combined, broken down by owner-occupiers and tenants, and the result is shown in the second and third rows in tables 6.3 and 6.4.

The 1993/94 survey only asked about the cost of minor repairs carried out by firms and others. Notwithstanding, an attempt has been made to calculate the extent of major home improvements, though, as can be seen from the above, any such calculation must be based on a great deal of supposition, if not bold supposition. Let us instead call it a mathematical exercise to establish an approximate level. The calculations assume an unchanged relationship in the two surveys from 1988 and 1993/94 between the total value of minor repairs on the one hand, and major home improvements and work on second homes on the other. This assumption was then combined with the comparative method. The method is described in more detail in Brodersen (1995b).

The results, together with Viby Mogensen’s from the 1988 survey, are shown in table 6.3. Any comparison between the two sets of results should be treated with a great deal of caution, however, partly because the methods used were not the same in both surveys, and partly because interview surveys always involve a certain degree of uncertainty, an uncertainty which is compounded when making comparisons between two such surveys. Finally, the choice of deflator when converting the results to the same price level will also be crucial to any comparison.

6.3 Validation of the Danish survey methods

Obviously, the analysis is based on a number of assumptions, the three most important being: First, that we can measure the actual cost of invoiced work done

by firms or non-invoiced work done by others fairly precisely through interviews. Second, that the respondent can give a fair estimate of the share of work done by firms, as DIY, or as non-invoiced work by others. The third, and not least critical, assumption is that the value of DIY for those households who say they have done all the work themselves is at the same level as invoiced work carried out 100% by a firm reported by other households in the same category of home ownership.

The first assumption can be tested by unpublished material from Statistics Denmark's consumer surveys, which we have had access to. The data is for 1994 and 1998, and has been collected using account books, which the selected households were asked to keep for a short period, and in-depth interviews for the latest one-year period. Overall household expenses on craftsmen, including materials, were calculated on the basis of answers from about 3000 households for each of the two 3-year periods 1993-95 and 1997-99. This was used by Statistics Denmark as a basis for calculating expenditure in 1994 and 1998. A distinction was made between repairs and maintenance on the one hand and expenditure of an investment nature on the other. The latter includes conversions, extensions, etc., which increase the value of the home.

We have compared Statistics Denmark's results with those from the Research Unit's 1993/94 and March 1998 surveys. Thus, both these surveys cover a 12-month period which falls within the first half of the 3-year periods covered by the consumer surveys, cf. table 6.1. The two sets of surveys were carried out completely independently of each other, and used partly different methods. Only in 1994 is there a difference of over 10% between the two surveys, for "minor repairs" and "major improvements" respectively. Since the differences between the two surveys have different signs in the two years concerned, there is no reason to suppose that the one method gives systematically different results from the other.

The first assumption appears to be confirmed by the agreement between actual expenditure on firms and non-invoiced work by others in Statistics Denmark's consumer surveys and the Research Unit's DIY survey. In fact, a surprisingly good match between these independent and methodologically different surveys was confirmed twice during the 1990s, at an interval of four years, and with considerable differences in the value of major home improvements and alterations.

The second assumption, whether households can give a fair estimate of the share of work done by firm, as DIY or as non-invoiced work by others, will probably require the participation of experts in the surveys and the direct inspection of homes in which DIY has been carried out.

The third assumption, on the other hand, can be tested by the survey from June 2001, where we asked about the kind of work done on the home. The answers to

these questions show no great tendency for households to leave the really major improvements to firms, cf. chapter 4. We found that such major improvements as a new kitchen, and renovations and extensions were more likely to be carried out as 100% DIY than 100% by a firm. Other work, such as floors, windows, doors and new roofs, etc., were equally likely to be carried out as 100% DIY or 100% by a firm.

Table 6.1: Expenditure on craftsmen/firms and on non-invoiced work by others, 1994 and 1998 prices. DKK billion

	Minor repairs and maintenance	Major improvements and alterations	Total
The Rockwool Foundation Research Unit 1993/94	3.5	8.6	12.1
Statistics Denmark 1994	4.2	7.3	11.5
Difference	(-0.7)	(1.3)	(0.6)
The Rockwool Foundation Research Unit 1998	5.4	20.1	25.5
Statistics Denmark 1998	5.5	20.6	26.1
Difference	(-0.1)	(-0.5)	(-0.6)

Note: The comparison is described in greater detail in Technical Note no. 6, 2001.

We have tried a more general way of validating our method by comparing our results with national accounts estimates for production and input for the relevant parts of the construction industry.

Danish households' expenditures on materials for DIY repairs and maintenance and major extensions, conversions and the building of all-year houses is based on Statistics Denmark's consumer surveys from 1994 and 1998, and can be seen in column 2 in table 6.2.

The turnover of DIY stores and paint and wallpaper shops, which is measured in Statistics Denmark's retail sales index, was over DKK 5 billion in 1994 and over DKK 7 billion in 1998, i.e. amounts which lie DKK 2-3 billion under households' materials purchases, according to the consumer surveys. In view of the considerable purchases made by DIY enthusiasts elsewhere, especially in timber yards, which do not come under the two aforementioned retail trades in the retail sales index, the figures seem reasonable – also given the fact that DIY stores sell both tools and materials for gardening and second homes, etc., which we have not included in the materials purchases in the consumer surveys.

The values for materials expenditure represent consumption in production from households' DIY. If we compare the purchases of materials for work on all-year homes with the estimated DIY values in the surveys from 1993/94 and 1998, converted to 1994 and 1998 prices respectively, we get a relation for the input percentage of households' DIY production.

Table 6.2: Estimated input of materials in minor and major DIY in the home

	Total value of DIY in purchaser prices[1)]	Value of materials purchases	Input percentage
	---------- DKK billion ----------		---------- % --------
1994	19.9	6.5	33
1998	26.4	9.6	36

1) The results of the two surveys, which covered work done in 1993 and 1997, have been converted to 1994 and 1998 price levels respectively.

The estimated input percentages are at the same level in the two surveys, i.e. around 35%. This should be seen in light of the fact that the production value and materials purchases are based on two completely separate surveys: The Research Unit's DIY surveys and Statistics Denmark's consumer surveys.

According to the national accounts (Statistics Denmark, 2001), in 1997, the direct requirement of goods and services on input was about 45% of the value of output in that part of the construction industry which is mainly involved in building repairs and maintenance, i.e. about 13% higher than our estimated value for the input percentage for DIY in the same year. The national accounts' input percentage is based on values in basic prices/purchaser prices, excluding VAT, while the values from the DIY surveys and consumer surveys in the table above are prices including VAT. This makes no difference as regards the comparison of input percentages, however, since households' materials purchases the estimated value of DIY are both inclusive 25% VAT.

If we take account of the fact that the national accounts' input percentage includes purchases of various services, energy, rent and minor purchases of, for example, tools which are not included in the direct materials purchases in the consumer surveys, then there is probably a reasonable agreement.

In a Norwegian input/output-based survey of non-market household production in 1991, Aslaksen, Fagerli & Gravningsmyhr (1995) find an input percentage of 32% for maintenance in general, i.e. maintenance of the home (which is the most important item), car, furniture, leisure equipment, etc. This is only slightly lower than the input percentage for home maintenance and major improvements estimated here.

A word of caution, however. Although, at first glance, our estimated value for DIY is almost the same as the levels in the national accounts, it should be mentioned that the input percentage for that part of the construction industry mainly concerned with building repairs and maintenance is a good deal lower than that for new building in general, which also includes the construction of large buildings involving a lot of prefabricated construction, and thus also higher input percentages. Both the consumer survey's materials purchases and DIY

activities include a certain proportion of new building, in the building or extension of own home. While the building of own homes is not directly mentioned in the questions in the DIY surveys, the occurrence of very large sums for the cost of work on the home done by a firm suggests that the respondent also includes this. Against this is the fact that, in our error correction of the data material, we omit values for expenditure on firms or others outside the household over a certain – albeit quite high – limit, cf. appendix B.

On balance, we can cautiously conclude that the levels we have estimated in the Danish surveys for the value of DIY do not appear to be substantially higher than those in the national accounts for the value of production in the construction industry. Considering that we obtain slightly lower, but nonetheless comparable, input percentages, and that the materials purchases in the consumer surveys come from surveys that are completely independent of our DIY surveys, we have good reason for believing that the level for the estimated values for purchases and production value we have found for the DIY sector in Denmark is reasonable.

A comparison of the results of the validation of the Danish surveys with those found over a longer period for work done on the home shows, in our view, that the method used here is both suitable and reliable. We have found both very stable values for minor repairs and maintenance and macroeconomically explainable movements in the value of major home improvements and alterations. The two latest Danish surveys only confirm this view. The results of the Danish surveys are presented in section 6.4, and a comparison of the results from all five northwest European countries surveyed is presented in sections 6.5 and 6.6.

6.4 Big increase in DIY in Denmark

The change shown for the period from 1988 to 1993/94 was in the expected direction, in accordance with the theory on the supply of DIY outlined at the start of the book (see figure 2.4 and table 6.3). Furthermore, the strongest effect was found in the reduction of the share of DIY in major home improvements and renovations, which were the main targets for the labour cost subsidies. The DIY share of major improvements dropped from 54% in 1988 to 42% in 1993.

All in all, the results appear to confirm that, in their choice between paid work, DIY and leisure time, households are very sensitive to major changes in the financial incentives offered. The state grants for part of the labour costs of VAT-registered building firms introduced in Denmark at the beginning of the 1990s to stimulate home repairs and improvements did precisely that: They significantly changed the relationship between disposable hourly income from paid work and the price of certain services which were direct substitutes for DIY (or black activities).

Put another way, the subsidies changed the relationship between the number of taxed working hours needed to pay a firm for a given job and the number of hours required to do the same job as DIY. In 1993 (the year covered by the survey), government grants actually paid amounted to DKK 1.5 billion (Ministry of Finance, 1995). However, owners of tenement buildings were also eligible for the grants. It is probably realistic to assume that at least 10% of households' expenditure on invoiced work by a firm was refunded by the government during this period.

The apparently strong effect of these subsidies agrees well with the fact that about 80-90% of all households which carried out DIY in the home gave saving money as one of the main reasons (see table 5.1). When the relative price of invoiced work by a firm falls, we must therefore expect a relatively strong shift away from DIY and black activities, as shown above.

The total value of home repairs and maintenance – by firms, "moonlighting craftsmen" or as DIY – increased dramatically from a level of about DKK 60 billion in the surveys from 1996/97 and 1998 to DKK 73 billion in the 2000 survey, cf. table 6.3. In the survey carried out six months later, i.e. for the period 2000/2001, the figure fell slightly again, but at DKK 69 billion is still clearly higher than in the surveys in the second half of the 1990s. There is an opposite trend for minor repairs and maintenance, however, which shows the same falling tendency as the proportion of households which say they have had this type of work done in the last 12 months.

Thus, it is major improvements and alterations that have pushed the total value up by so much in the two recent surveys. As mentioned previously, this should be seen in the light of both the general economic conditions and the extensive damage caused by the December 1999 storm. It took most of 2000 to repair this damage, which was estimated at DKK 15 billion. Both the two latest surveys are therefore influenced by this one-off event – the 2000 survey in full, while the latest survey only includes the remainder of the storm repairs.

Since the mid-1990s, there has been a fall in minor DIY home repairs and maintenance, while there has been a huge increase in major improvements and alterations. We have estimated the total value of DIY to be in the region of DKK 40 billion in 2000 and 2001, which is somewhat higher than the highest measured level from the mid-1990s to date. The value of major DIY is at the same level in the two latest surveys (if not higher in 2001), which must largely be attributed to the higher proportion of major improvements and alterations which, especially in the latest survey, households say they have done themselves.

All in all, therefore, there has been a dramatic increase in the total amount of DIY carried out in the home over the last few years, which in the last two surveys has been estimated at approximately DKK 40 billion (including materials

and VAT). We described the types of work done by households in chapter 4 above, but it is worth noting here the divergence between minor repairs and maintenance and major improvements and changes over the 13 years which our surveys cover.

Table 6.3: Total value of DIY in the home. Denmark. 2001 prices

	1988	1993/94	1996/97	1998	2000	2001
Minor repairs and maintenance						
	---------- DKK billion ----------					
Firm	4.1	4.9	5.2	5.9	4.5	3.3
DIY	17.1	18.4	18.2	15.6	15.2	12.1
Others	1.2	0.8	0.8	1.1	0.6	0.6
Total	22.4	24.1	24.2	22.6	20.3	16.0
	---------- % ----------					
Firm	18.3	20.3	21.5	26.1	22.2	20.6
DIY	76.3	76.4	75.2	69.0	74.9	75.6
Others	5.4	3.3	3.3	4.9	2.9	3.8
Total	100.0	100.0	100.0	100.0	100.0	100.0
Major improvements						
	---------- DKK billion ----------					
Firm	5.9	10.3	18.2	21.6	23.4	21.1
DIY	7.8	7.9	17.7	14.3	26.1	28.7
Others	1.5	0.6	1.6	1.4	2.9	2.8
Total	15.2	18.8	37.5	37.3	52.4	52.6
	---------- % ----------					
Firm	38.8	54.8	48.5	57.9	44.7	40.1
DIY	51.3	42.0	47.2	38.3	49.8	54.6
Others	9.9	3.2	4.3	3.8	5.5	5.3
Total	100.0	100.0	100.0	100.0	100.0	100.0

In 1988, the value of minor DIY repairs and maintenance was double that of major DIY improvements and alterations (DKK 17.1 billion and DKK 7.8 billion respectively, in 2001 prices). This was reversed in 2001, however (DKK 12.1 billion and DKK 28.7 billion respectively). The value of major DIY improvements and alterations is now more than double that of minor repairs and maintenance. Apart from the aforementioned need for major repairs due to storm damage, this trend should be seen in light of the development of more DIY-friendly building materials and tools, and the greater awareness and knowledge of the possibilities for doing the work oneself, which is in no small part due to widely popular DIY programmes on TV.

The new Danish surveys show a higher absolute level for the value of DIY in the home (including materials) in 2000 and 2001 than in any previous survey. We have estimated the total value of these activities at about DKK 40 billion. This corresponds to about 3% of GDP, about the same level as the approximately 3% we found for 1996/97, though significantly higher than in any other previous Danish survey from the Research Unit. We have converted the total value of

DIY to the number of full-time jobs that would be created in the construction industry if this work were carried out by VAT-registered firms instead. In our calculations, we have used input-output coefficients, which express the number of additional jobs that would be created in the construction industry for each DKK 1 billion of demand. Such coefficients are calculated each year by Statistics Denmark.

The calculations for 2000 and 2001 show that the total value of DIY in Denmark corresponds to 50,000 full-time jobs. Put another way, the DIY activities of every 1000 Danes between 18 and 70 correspond to 12-14 full-time jobs. The calculations are described in more detail in section 6.6. below.

The enormous growth in Danes' DIY and in work done by craft firms since the beginning of the 1990s should be seen in the light of both the generally favourable economic climate in Denmark in this period and the fact that there was actually a huge need for modernization and major repairs of the existing housing stock, not least of the popular single-family detached houses. A questionnaire survey of 727 estate agents from all over Denmark, carried out by The Danish Federation of Small and Medium-Sized Enterprises, Håndværksrådet (1992), revealed the need for extensive modernization of this type of housing at the beginning of the 1990s, something which typically happens in connection with a change of ownership.

Non-renovated properties were in especially bad condition on the outside, which is presumed to be closely related to the fact that older, non-renovated houses are typically occupied by elderly persons (often the original occupants). The elderly are often physically incapable of maintaining their homes themselves, just as their age and poor physical condition can blind them to the need for maintenance.

As regards modernization, the general impression is that much of the work is done as DIY (often in connection with a change of ownership). According to the estate agents, they find poor craftsmanship in about one in four houses on the market. This is thought to be typically DIY.

Poor craftsmanship is found particularly in older single-family houses (86%), older houses in the country and older owner-occupied flats, but also in newer single-family housing from the 1960s (37%), where suspended ceilings and a change in layout (blinding of doors) are the most frequent examples of shoddy DIY.

Estate agents come across illegal alterations (presumably DIY) in the form of ceilings and electrical installations, etc., in about 15% of the houses they sell. They rarely see illegal plumbing and heating installations.

DIY can in many cases be a short-sighted solution to a needy repair, etc., since illegal work will reduce the market value of the house.

A report from the Ministry of Housing (Boligministeriet, 1998) underlines the huge need for modernization of single-family housing in Denmark by also including newer single-family housing. According to the report, houses built in the period 1960-80 are in particular need of renovation.

The report is based on a representative sample of property condition surveys written by building experts, which, since 1996, have been obligatory in connection with the sale of property. The sample involved about 1500 properties selected from the registers.

Replacing part of an existing house normally costs a lot more than its cost in a new house. A complete modernization can easily cost twice as much as a new house.

Even though the kitchen and bathroom are the two most expensive rooms in a house, new owners in particular characteristically choose to modernise precisely these two rooms – whether they need it or not.

Finally, the Ministry of Housing report mentions that, within the last 12 months (1996), 5.8% of Danish homeowners have installed a new kitchen, while 6.7% have installed a new bathroom.

6.5 Similarities and differences in the value of DIY between five north-west European countries

There are remarkable similarities between the countries in the total value of work which households themselves have carried out in the form of DIY or left to a firm or others to do (see tables 6.3 and 6.4). If we ignore the differences between the countries in the extent or value of work done, then a very stable picture emerges for minor repairs and maintenance. In Sweden, Norway and Germany, DIY constitutes about 80% of work done, while in Denmark the DIY share has been stable at around 75% over a 13-year period (slightly lower in the 1988 survey). In Great Britain, however, the household only carries out about 50% of repairs and maintenance itself.

Major improvements are carried out as DIY by the household itself to a much smaller extent, which applies to all countries and all surveys, though the variation from country to country and between the various Danish surveys is greater than for minor repairs and maintenance. In Denmark, Sweden and Germany, the DIY share is typically between 40-60%, while in Norway it is 70%, estimated in purchaser prices of invoiced work by firms. British homeowners

carry out a significantly lower proportion of major improvements themselves, namely about 25%.

Table 6.4: Total value of DIY in own home. Other countries. Prices in the survey year concerned

	Sweden 1997/98	Norway 1998	Great Britain 2000	Germany 2001
Minor repairs and maintenance				
	---------- Billion units of national currency ----------			
Firm	4.8	3.2	4.1	5.9
DIY	25.9	13.7	6.6	32.0
Others	1.5	0.3	1.7	1.9
Total	32.2	17.2	12.4	39.8
	---------- % ----------			
Firm	14.9	18.6	33.1	14.8
DIY	80.4	79.7	53.2	80.4
Others	4.7	1.7	13.7	4.8
Total	100.0	100.0	100.0	100.0
Major improvements				
	---------- Billion units of national currency ----------			
Firm	12.4	8.6	16.7	6.1
DIY	20.0	21.8	6.5	5.9
Others	1.9	0.7	1.8	0.5
Total	34.3	31.1	25.0	12.5
	---------- %[1)] ----------			
Firm	36.2	27.7	66.8	48.9
DIY	58.3	70.1	26.0	47.2
Others	5.5	2.3	7.2	4.0
Total	100.0	100.0	100.0	100.0

1) Due to rounding, the sum of percentages can be different from 100.

The greater variation for this type of work is probably due to the fact that major improvements are more sensitive to economic fluctuations or affected by special factors, e.g. storm damage or temporary government subsidies. Nor can a higher sample uncertainty be ruled out.

The results of the British survey are both very distinctive and bear out our assumptions regarding the correlation between the supply of labour and income and marginal tax. Great Britain has a lower tax burden than the other four countries, cf. OECD (2002b), and, as far as we can tell, also a lower marginal tax for most income groups.

Britons and Germans in the median income groups have to work about 2-4 ordinary hours more to pay for one craftsman-hour, against typically 4-6 hours in the other countries.

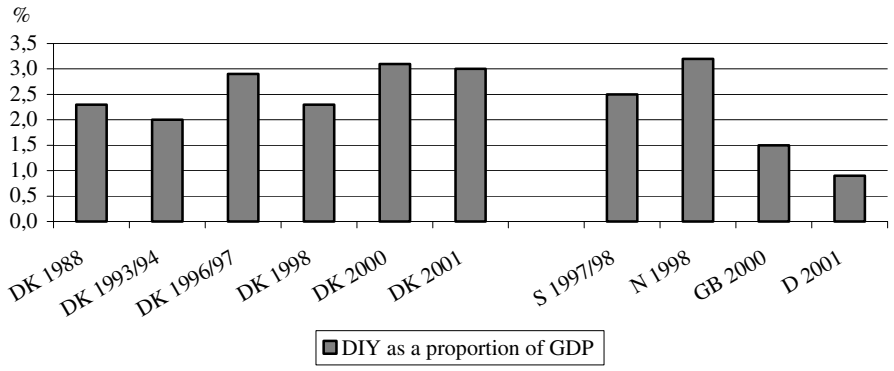
The very high DIY share for Norway, which is only markedly different for major home improvements, cannot be explained by either income or marginal tax, but is probably more to do with the special geographical conditions and the

tradition for timber houses in Norway. We also found a high DIY share for major improvements in Sweden (58%), and from the Danish survey in 2001 (see table 4.3) we know that some of the most popular DIY involves precisely wood products: New kitchen installations, new ceilings, doors and windows, conversions, etc. Conversely, work which requires a lot of, for example, bricklaying and plumbing will rarely be carried out as 100% DIY.

If we look at total DIY in relation to GDP, two things in particular stand out: Firstly, DIY in Danish homes has grown in relative importance over the last 13 years (see figure 6.1), from over 2% of GDP in the first Danish surveys from 1987 and 1993/94 to about 3% at the turn of the millennium. Secondly, the Research Unit's results show a level of 2½-3% of GDP in the Scandinavian countries, compared with 1-1½ % in Great Britain and Germany. The Research Unit's surveys thus clearly indicate both a growing extent of DIY and large differences in levels between the Scandinavian countries on the one hand and the two big northwest European countries on the other.

Bonke (1993) estimates a total value for household work for 1987 of approximately DKK 300 billion (in 1993 prices), and Rørmose & Møllegaard (1995) find similar results. We found a total value for DIY in 1993/94 of DKK 18 billion, including the value of input materials, which are not included in the estimates of total household production based on Danish time use studies. DIY minor repairs and major improvements carried out in the home in Denmark thus constitute about 6% of the values found for total household production.

Figure 6.1: Extent of DIY home maintenance and improvements, measured as a share of the respective countries' GDP



Norwegians and, recently, Danes, stand out as the most DIY enthusiastic in northwest Europe, with a per capita value for total DIY home maintenance and improvements of more than € 1000 in 2001 prices (see table 6.5). Swedes come next, with a value of over € 600 per capita, or almost the same level as in the

Danish survey in the same year (1998). The levels in Great Britain and Germany were considerably lower, where per capita values for this type of DIY are between 1/3 – 1/5 of the high levels in Norway and Denmark. For minor repairs and maintenance, values were largely identical between the countries and between the various Danish surveys, though the level in both Great Britain and Germany is only about half that in the Scandinavian countries for the DIY value in Euro per capita. The difference is much greater for major improvements and extensions, where Germany in particular stands out with an exceptionally low level, which is only 6% of the high Danish/Norwegian level for major DIY.

Table 6.5: Value of households' DIY in the home, in 2001 purchaser prices[1)] per inhabitant, converted to Euro

		Minor repairs and maintenance	Major improvements	Total
S	1997/98	358	277	635
DK	1998	395	362	757
N	1998	417	671	1088
GB	2000	192	178	370
DK	2000	385	661	1046
DK	2001	306	727	1033
D	2001	199	41	239

1) The price the household would have had to pay a firm, including materials used and VAT.

The very low level for DIY in Germany can only to a limited extent be explained by lower marginal taxation here than, for example, in the Scandinavian countries. We have shown that it is not so much due to the low share of DIY in the work which German households have had done on the home, but rather to the very low level for the frequency of work on the home in general. This can to some extend be explained by a somewhat depressed German economy during that period. Furthermore due to the large number of households in rented accommodation in Germany compared with the other countries in the Research Unit's surveys, a lower level for especially major improvements was only to be expected, which has been more than confirmed. However, a more developed market for ready-built houses, which are built at a developer's own expense and risk, can result in lower values for work done as DIY in Germany than in countries where, to a larger extent, the household is directly responsible for the construction of new single-family homes, and does some of the work itself – and in some cases more or less all of it – which is not unusual in the Scandinavian countries.

6.6 DIY on an all-year house converted to full-time jobs

In this section, we attempt to calculate how many jobs would be created in the construction industry if all the work which households in the various surveys say they do themselves had been carried out by a craft firm instead.

We take a starting point in the estimated value of DIY in market prices, i.e. what it would have cost for a craft firm to do the work, including materials and VAT.

In some countries it is usual to calculate so-called input-output coefficients, including a coefficient for the direct effect on employment in a given industry for each million national currency units' demand for that industry's products. These coefficients are based on the production value in basic prices, i.e. excluding VAT on deliveries from industry. In the Research Unit's surveys, the value of DIY in market prices has therefore been converted to basic prices by correcting for VAT on work done for private households by the construction industry.

Input-output coefficients are usually calculated after a time lag of several years, and since the coefficients are specific to the price level of the year concerned, it has in some cases been necessary to convert the value of DIY to the prices in the year which the I/O coefficients concern. In these cases, we have used a building cost index (so-called input-price index) for home repairs and housing construction respectively, though for Great Britain we have used an output-price index for major improvements. The same type of index has also been used in comparisons of the value of DIY in different survey years. The results should therefore be interpreted with caution, and only the most robust results used as a basis for the conclusions.

The number of full-time jobs are thus calculated as follows:

1. Value of DIY in year t in market prices
2. Value excluding VAT (year t basic prices)
3. Value converted to basic prices in year t-y
4. Number of employed persons in building repairs and improvements (housing construction) for each million DKK/NOK/SEK/GBP/DEM, demand (I/O coefficients for year t-y)
5. Employment content (3. x 4.)

Note: t-y is the year for the I/O coefficients.

As can be seen from the above, the value of total DIY is of macroeconomic importance. Based on these values, we have estimated the total employment content by taking a starting point in coefficients for the direct employment content in production from the most comparable parts of the construction industry for which data are available. The data from Denmark, Sweden and Germany have been of this kind, while we have used Swedish coefficients to estimate the employment content in Norway and German coefficients for Great Britain.

The estimates, which, as mentioned above, are subject to considerable reservations, show that the DIY activities of every 1000 Danes in 2000 and 2001 and of

Norwegians in 1998 would have created about 10 full-time jobs in the construction industry if the work had been done as invoiced work by a firm instead (see table 6.6). The level is slightly lower in Sweden, and in the Danish survey from 1998, with a job creation corresponding to about 7-8 full-time jobs. We found substantially lower levels in Great Britain and Germany, where only 3-4 new jobs would have been created for every 1000 inhabitants, even though the figures for these countries included both full- and part-time jobs.

Table 6.6: Estimated number of full-time jobs from households' DIY on an all-year home, per 1000 inhabitants

		Minor repairs and maintenance	Major improvements	Total
		--------- No. of jobs per 1000 inhabitants ----------		
S	1997/98	4.1	2.7	6.7
DK	1998	4.1	3.7	7.8
N	1998[1)]	4.2	5.9	10.1
GB	2000[2)]	2.1	2.1	4.2
DK	2000	3.8	6.0	9.8
DK	2001	3.1	6.7	9.8
D	2001	2.3	0.5	2.8

[1)] Swedish coefficients have been used for the direct employment content.
[2)] German coefficients have been used for the direct employment content.

6.7 Concluding remarks

We have tried to explain the very clear picture of a high Scandinavian level for DIY in the form of home repairs and maintenance and improvements by differences in economic incentives resulting from the distortion of relative prices by the tax system in these countries, which have a relatively high tax burden and high marginal taxes compared with Great Britain and Germany. But other factors also play a role.

First, very low growth rates in the German economy during the period covered by the Rockwool Foundation Research Unit survey.

Second, national differences in building traditions and in the actual need for major repairs, etc., of the housing stock are important for both the total volume of work done and for the proportion carried out as DIY. This has been documented in Danish surveys of the need for major renovation and modernization of also newer houses from the 1960s and 1970s.

In this connection, it should be mentioned that, according to Eurostat calculations based on purchasing power parities, the real value of total housing-related consumption is much higher in the Scandinavian countries than in Great Britain and Germany. Given this, we should therefore expect to find higher levels for

total home repairs and maintenance in the also more geographically dispersed populations in Scandinavia, and with it higher overall values for DIY.

Another factor which should not be ruled out is that there can be different traditions between the countries as regards the acquisition of DIY skills. In particular, the improvement in building materials and tools for DIY enthusiasts in recent years, combined with intensified information, and even direct DIY courses – not least through popular TV programmes – can help explain the significant growth in DIY in Denmark over the last 13 years. This is further supported by the above-mentioned huge need for renovation and modernization of parts of the Danish housing stock. Finally, special national factors, such as temporary subsidies and storm damage, can also help explain differences between countries and between years.

7. Summary

7.1 General summary

This book differs from other international research by publishing and evaluating results from 10 DIY surveys carried out by the Rockwool Foundation Research Unit over an 8-year period from 1993/94 to 2001. Six of the surveys were carried out in Denmark, and the remaining four in Sweden, Norway, Great Britain and Germany, the latter four between 1998 and 2001. All surveys were interview surveys, based on a more or less identical core of questions on DIY.

The method first used by Pahl (1984) proved to be successful in several reruns of some direct questions about the relative extent of DIY, first asked in an earlier Danish survey in 1988. Six later Danish DIY surveys from the Research Unit and four surveys in Sweden, Norway, Great Britain and Germany also included questions about direct expenditure on home maintenance or improvements carried out by firms or others outside the household. The answers to these questions were used to calculate the socioeconomic value of DIY home maintenance and improvements. In addition, three of the Danish surveys and the German survey also included questions about the motivation for carrying out DIY, and, finally, the Danish survey in 2001 asked about concrete types of home maintenance or improvements reported by the households.

The surveys in Denmark and the four other northwest European countries over the last 10 years appear to vindicate the use of direct questions as a means of measuring trends in DIY over time, and for analysing the factors which determine the extent of DIY among various types of households.

From a methodological point of view, it is interesting that the questions in this area gave such comparable answers in successive surveys in Denmark and in four surveys in Sweden, Norway, Great Britain and Germany. In an area which must be seen as being less affected by economic conditions and other events, minor repairs, the pattern of answers is fairly stable, while there is a clearly stronger variation over time and between countries in the pattern of DIY for major improvements. In Denmark in 1993/94, the state grants resulted in a shift in relative prices to the advantage of invoiced work by a firm, while the winter storm in 1999 created an urgent need for major home improvements in 2000 and 2001, and with it also financing via the damages paid out by the insurance companies.

Frequencies for minor repairs and maintenance are more or less within the same band of variation in the Danish surveys and in the four other northwest European countries surveyed, but for major home improvements we found a relatively

much wider spread in the results. The last four Danish surveys show significantly higher frequencies for major home improvements than in the four other countries surveyed. The Research Unit's survey in Germany found an extremely low level of frequencies for major home improvements. Favourable trade cycle movements in Denmark during that period and a depressed German economy explain a good deal of the variation.

The results for DIY shares in the four other countries surveyed are remarkably similar to the pattern in the Danish surveys – only Great Britain has a significantly lower level of DIY shares for home repairs and maintenance and major improvements. This was not unexpected, however, given the lower tax burden in Great Britain compared with the Scandinavian countries and the fact that marginal tax rates for most wage earners are the lowest of the five countries surveyed. For Norway, we found an unexpectedly high level of DIY home improvements, which is probably due to the strong tradition for this type of DIY in Norway. This is to some extent supported by the tradition for wooden houses and the fact that the population is spread over a very wide geographical area, which can make it difficult to get hold of craftsmen.

In line with earlier Danish and international surveys, a logistic test of the last five Danish surveys combined and the four other northwest European countries surveyed showed that the willingness of respondents to reveal whether their household had carried out DIY within the last 12 months depended on three factors in particular: The respondent's age, whether the household is owner-occupied, and the respondent's marital status.

We have found that age is a statistically significant factor which affects households' likelihood of carrying out both major and minor DIY in the home. The likelihood of having carried out DIY within the last 12 months falls with age, and previous Danish surveys (Brodersen, 1995b) showed that the scale of work done also falls. This is a clearly significant variable in all our Danish surveys, and in the surveys in Norway, Sweden, Germany and Great Britain.

Whether the respondent was an owner-occupier or not was also a significant independent variable, those who owned their own homes being the most likely to carry out minor repairs and major improvements themselves. This is clearly the most significant variable in all the countries we have surveyed. We have also shown that the volume and value of DIY in relation to home repairs and maintenance is much higher for owner-occupiers than for tenants.

It should be noted that the results of these surveys, based on the share of work carried out by the household as DIY, cannot be directly converted to a picture of the volume of work involved. While owner-occupiers carry out only a slightly higher share of minor repairs and improvements than tenants (and in some sur-

veys even less), calculations in this book show that the volume of work done by owner-occupiers was from two to more than twenty times higher.

Marital status is a third important variable, which is significant in the Danish surveys since 1995, and in Sweden, Norway, Germany and Great Britain. The variable is not significant with regard to major home improvements in Great Britain, however, and the level of significance is lower for Sweden. In the 1993/-94 survey, marital status was not significant.

Apart from these three variables, which give significant results in all five north-west European countries, we have found significant results for a number of other variables in several of the countries. For income, we found significant results in all countries except Great Britain, though, apart from Sweden, the level of significance is low. In the Scandinavian countries, there is a positive correlation between income and the likelihood of DIY in the home, while the correlation is inverse in Germany. The latter result was surprising, since we had expected to find the same result as we found in Germany in all the surveyed countries.

We also found that respondents' occupation plays a role in Denmark, Sweden and Germany. It is especially skilled workers and the self-employed who carry out minor home repairs and maintenance. Skilled workers are significantly more likely to carry out this type of work in all three countries, and to carry out major improvements in the Danish survey from 1993/94. On the other hand, the self-employed are significantly less likely to carry out minor DIY than other occupational groups in the latter survey and in Sweden. In Germany, educational level also appears to play a role.

Finally, we found a regional effect in Sweden, Great Britain and Germany – there is a greater likelihood of both minor and major DIY in the home in the new German Länder in particular.

The latest Danish survey of DIY from 2001 included, for the first time in the Research Unit's series of surveys, questions on the type of work involved in those households which had had either minor repairs and maintenance or major improvements and extensions carried out within the last 12 months.

In the case of minor repairs and maintenance, painting and wallpapering is by far the most common type of DIY activity, accounting for 63% of the 352 cases where households say they have done this type of work themselves 100%. In those cases where a firm has done all the work, painting accounts for only 21% of the cases. The high figure for DIY probably reflects the fact that painting neither requires special knowledge nor expensive tools – whether the quality matches that of a professional painter is another matter, of course.

This preference for work which does not appear to require much in the way of specialist qualifications is to some extent reflected in the type of major projects which the household chooses to carry out entirely by itself. Typically, this includes fitting a new kitchen, new ceiling, cupboards and other carpentry, but households also carry out conversions and extensions largely by themselves. On the other hand, they typically leave decidedly specialist work, such as new bathrooms, plumbing and heating, new boilers, etc., to a firm. Thus, it is mainly work which requires expensive special tools or specialist knowledge which households avoid doing as DIY. It does not seem to be the actual *scale* of the work which determines whether or not it is carried out as DIY – a result which is important for the reliability of our method of calculating the economic macro value of DIY, see section 6.3 on validation of the method.

In the three Danish surveys from 1993/94, 2000 and 2001, plus the German survey from 2001, respondents who said that their household had carried out DIY were asked about their motives for doing so, the main emphasis being on economic motives. In both the Danish and German surveys, 75-87% of those asked said that it was mainly or partly to save money, while less than 25% said it was mainly because they enjoy doing this type of work. Only around 10% said that they carried out major home improvement as DIY because they enjoyed it. Those Danes who give enjoyment as the main motive for carrying out DIY also do a greater part of the work themselves – around 90% of the minor DIY and 65% of major improvements, compared with about 80% and 50% respectively for households whose main motive is to save money. The German questions are not fully comparable with the Danish questions, but reveal a similar picture.

The results agree with a number of other surveys from European countries and the USA, which show both that economic motives play a large part in this context and that DIY is not considered as enjoyable as other activities, but also that there is a tendency to spend more time on activities that are rated highly.

In support of the fact that 75-87% of those asked said that they mainly or partly carried out DIY to save money, we found a clear reaction to the temporary government subsidies for renovation and improvement of existing houses in Denmark. In the Danish survey from 1993/94, when these subsidies were introduced, the share of work done by firms was very high and the share of both DIY and non-invoiced work by others outside the household was relative low compared to an earlier and later Danish survey.

According to a Dutch study from 1993, there would have to be an extremely big change in relative prices in this context to make larger numbers of households switch from DIY to paying a firm to carry out home maintenance and improvements.

That there are good reasons to weight financial incentives for DIY highly is emphasised by the fact that, in Denmark, an experienced and highly qualified surgeon would have to work over three hours' overtime to pay for one hour's work by a craftsman, and almost five hours' work at normal rates. This is despite recent years' efforts to reduce marginal tax on income in Denmark. The situation is similar in the other northwest European countries – a concrete example from Sweden shows the same, and we also think this is the case in Norway. In Great Britain and Germany, we estimate that a similar wage earner would only have to work 2-4 ordinary working hours' to pay for one hour's fully taxed work by a craftsman.

We have cautiously estimated that the total value of DIY in the form of home repairs and maintenance and improvements corresponds to approximately 2 1/2-3% of GDP in the Scandinavian countries and 1-1 1/2% in Germany and Great Britain. Using input coefficients from the national accounts, we have converted these values to the number of full-time jobs that would be created in the construction industry if all the DIY in question were carried out as invoiced work by a firm. We found that, in the latest Danish surveys and in Norway, the DIY activities of every 1000 inhabitants would correspond to 10 full-time jobs a year – slightly less in Sweden and in earlier Danish surveys. The surveys in Great Britain and Germany indicate a significantly lower level, corresponding to 3-4 full-time jobs per 1000 inhabitants.

We have tried to explain the very clear picture of a high Scandinavian level for DIY in the form of home repairs and maintenance and improvements by differences in economic incentives resulting from the distortion of relative prices by the tax system in these countries, which have a relatively high tax burden and high marginal taxes compared with Great Britain and Germany. But other factors also play a role.

First, very low growth rates in the German economy during the period covered by the Rockwool Foundation Research Unit survey.

Second, national differences in building traditions and in the actual need for major repairs, etc., of the housing stock are important for both the total volume of work done and for the proportion carried out as DIY. This has been documented in Danish surveys of the need for major renovation and modernization of also newer houses from the 1960s and 1970s housing construction boom.

Third, Eurostat calculations show that, based on purchasing power parities, the real value of total spending on housing is higher in the Scandinavian countries than in Great Britain and Germany. Given this, we should therefore expect to find higher levels for total home repairs and maintenance in Scandinavia, and with it greater possibilities for DIY here, and the relatively high proportion of

Scandinavian owner-occupier households is also an important explanation for the high Scandinavian DIY levels.

Another factor which should not be ruled out is that there can be different traditions between the countries as regards the acquisition of DIY skills. In particular, the improvement in building materials and tools for DIY enthusiasts in recent years, combined with intensified information, and even direct DIY courses – not least through popular TV programmes – can help explain the significant growth in DIY in Denmark over the last 13 years. This is further supported by the above-mentioned huge need for renovation and modernization of parts of the Danish housing stock. Finally, special national factors, such as temporary subsidies and storm damage, can also help explain differences between countries and between years.

In this connection, it should be mentioned that the enormous growth in DIY in Denmark in recent years has occurred during a period in which successive tax reforms have reduced marginal income taxes from a high of about 69% in 1993 to approximately 63% in 2001.

Finally, the method for calculating the macroeconomic value of home DIY has been successfully validated against Statistics Denmark's consumer surveys and Danish national accounts figures from 1994 and 1998. We found a surprisingly good match between consumer survey information on household purchases of home maintenance and improvements carried out by firms and the Research Unit's corresponding results. Based on the consumer surveys' materials purchases and our estimated values for DIY production, we calculated input percentages which were not that much lower than the national accounts' input percentages for similar production, and which agreed with a Norwegian input/-output-based survey from 1995. We regard this result as confirming that our survey methods – at least those for Denmark – enable us to estimate overall values for DIY comparable with those in the national accounts for the relevant parts of the industry.

In our view, we have developed a method for calculating the total value of DIY home maintenance and improvements which, despite its being output-based, does not require the large amounts of data (on volume, quality, etc.) which numerous articles and handbooks in the area claim. At the same time, it avoids the problems with pricing and productivity assumptions common to input-based methods with a starting point in time use.

7.2 Conclusion

The main results of the Rockwool Foundation Research Unit's DIY surveys can be summarised in the following six points:

1. Ten almost identical surveys in five northwest European countries have made it possible to – successfully – test a method using direct questions on DIY shares and the purchase of similar services in the market.

2. We have demonstrated a relatively very high level of home-related DIY in Scandinavia compared with Germany and Great Britain. DIY constitutes 2 1/2-3% of GDP in the former countries, against 1-1 1/2% in the two latter. We have found low frequencies for this type of work in Germany, especially for major improvements, irrespective of who carried it out, while there were relatively low DIY shares in Great Britain. The weak growth of the German economy in recent years, and lower taxation in Great Britain, and with it lower relative hourly wages for craftsmen compared with the Scandinavian countries, clearly help explain the striking differences. However, a number of other factors, e.g. building traditions, craft skills, and single events such as storm damage and temporary subsidies also play a role.

3. We have shown an increase in the extent of DIY in Denmark over a 13-year period, accompanied by a shift away from minor repairs and maintenance towards major home improvements. Apart from the storm damage in December 1999, economic conditions and the technological development of building materials and tools, supported by information about DIY via, for example, TV, also help explain this trend. A trend which has occurred despite attempts in the same period to reduce marginal taxes in Denmark.

4. In all the Research Unit's surveys, and in agreement with surveys from a large number of countries, we have found that home ownership is by far the most important explanatory factor for the extent of DIY, but age and marital status are also significant variables in all surveys.

5. Again as in other surveys, we have found that most people carry out DIY in the home mainly or partly to save money.

6. We have found that, for minor DIY repairs and maintenance, painting is by far the most frequent type of work carried out, while for major improvements, new kitchens, new ceilings, cupboards and other carpentry, together with conversions and extensions, are the relatively most popular. Thus, while households are not afraid to tackle major projects, they tend to avoid work which requires specialist knowledge and expensive tools, e.g. much plumbing/heating and electrical work.

Appendix

Appendix A: Overview of the DIY surveys

Appendix Table A1: Interview surveys of DIY in 5 countries, carried out by the Rockwool Foundation Research Unit

Country	Interview Year	Month carried out	Approx. period covered by the survey
DK	1988	March-May	March 1987 - May 1988
DK	1993/94	October -March	October 1992 - March 1994
DK	1996[1)]	Feb.-March	Feb. 1995 - March 1996
DK	1997[1)]	February	Feb. 1996 - Feb. 1997
DK	1998	March	March 1997 - March 1998
DK	2000	November	November 1999 - November 2000
DK	2001	June	June 2000 - June 2001
S	1997/98	Dec.-Jan.	Dec. 1996 - Jan. 1998
N	1998	May-July	May 1997 - July 1998
GB	2000	April	April 1999 - April 2000
D	2001	April-October	April 2000 - October 2001

1) When calculating the value of DIY activities, the two surveys from 1996 and 1997 were combined due to the small sample size.

Appendix B: Technical data on data collection in surveys from the Rockwool Foundation Research Unit since 1996

DATA COLLECTION	
Omnibus survey	1996 Statistics Denmark
Method	Telephone interview
Carried out	Feb.-March 96
Covers DIY over 12 months	Feb. 95-March 96
No. of respondents	2,300
No. with telephone	1,886
No. of completed interviews, 16-74-year-olds	1,532
No. of completed interviews, 18-66-year-olds	1,347
No. of answers corrected for errors, 18-66-year-olds	74
Accepted min/max amount for firm:	
- Minor repairs	DKK 0-55,000
- Major improvements	DKK 0-1.0 million
Accepted min/max amount for others:	
- Minor repairs	DKK 0-55,000
- Major improvements	DKK 0-1.0 million
<u>18-66-year-olds:</u>	
No. with minor repairs	795
No. with major improvements	226
No. by DIY, minor repairs	674
No. by DIY, major improvements	149
No. by DIY, either minor repairs or major improvements or both	730
Proportion of interviews carried out where minor repairs and major improvements are by DIY	54%
No. who have disclosed expenses for firm	
- Minor repairs	201
- Major improvements	125
Conversion of average value to macro figures	- Correction for households with more than one adult - Owner-occupiers and tenants listed separately

Continued

DATA COLLECTION		
Omnibus survey	1997 Statistics Denmark	1998 Statistics Denmark
Method	Telephone interview	Telephone interview
Carried out	February 1997	March 1998
Covers DIY over 12 months	February 1996-February 1997	March 1997-March 1998
No. of respondents	1,500	1,500
No. with telephone	1,259	1,258
No. of completed interviews, 16-74-year-olds	990	974
No. of completed interviews, 18-66-year-olds	869	853
No. of answers corrected for errors, 18-66-year-olds	37	81
Accepted min/max amount for firm:		
- Minor repairs	DKK 0-55,000	DKK 0-55,000
- Major improvements	DKK 0-1.0 million	DKK 0-1.0 million
Accepted min/max amount for others:		
- Minor repairs	DKK 0-55,000	DKK 0-55,000
- Major improvements	DKK 0-1.0 million	DKK 0-1.0 million
<u>18-66-year-olds:</u>		
No. with minor repairs	518	492
No. with major improvements	183	161
No. by DIY, minor repairs	444	409
No. by DIY, major improvements	118	104
No. by DIY, either minor repairs or major improvements or both	494	458
Proportion of interviews carried out where minor repairs and major improvements are by DIY	57%	54%
No. who have disclosed expenses for firm		
- Minor repairs	180	188
- Major improvements	102	118
Conversion of average value to macro figures	- Correction for households with more than one adult - Owner-occupiers and tenants listed separately	

Continued

DATA COLLECTION		
Omnibus survey	2000 Statistics Denmark	2001 Statistics Denmark
Method	Telephone interview	Telephone interview
Carried out	November 00	June 01
Covers DIY over 12 months	November 99-November 00	June 00-June 01
No. of respondents	1,500	1,500
No. with telephone	1,225	1,328
No. of completed interviews, 16-74-year-olds	959	897
No. of completed interviews, 18-66-year-olds	859	797
No. of answers corrected for errors, 18-66-year-olds	79	69
Accepted min/max amount for firm:		
- Minor repairs	DKK 200-55,000	DKK 200-55,000
- Major improvements	DKK 200-1.0 million	DKK 200-1.0 million
Accepted min/max amount for others:		
- Minor repairs	DKK 0-55,000	DKK 0-55,000
- Major improvements	DKK 0-1.0 million	DKK 0-1.0 million
<u>18-66-year-olds:</u>		
No. with minor repairs	409	358
No. with major improvements	194	171
No. by DIY, minor repairs	355	308
No. by DIY, major improvements	135	125
No. by DIY, either minor repairs or major improvements or both	429	384
Proportion of interviews carried out where minor repairs and major improvements are by DIY	50%	48%
No. who have disclosed expenses for firm		
- Minor repairs	147	106
- Major improvements	121	88
Conversion of average value to macro figures	- Correction for households with more than one adult - Owner-occupiers and tenants listed separately	

Continued

DATA COLLECTION		
Collected in	Sweden	Norway
Omnibus survey	1997/98 Statistics Sweden	1998 Statistics Norway
Method	Telephone interview	Telephone interview 46.7 % / Face-to-face interview 53.3 %
Carried out	Dec 97-Jan 98	25/5-3/7 1998
Covers DIY over 12 months	Dec. 96 - Jan. 98	Maj 97 - Juli 98
No. of respondents	3,000	2,000
No. with telephone	2,867	•
Total number of interviews carried out	…	1,220
No. of completed interviews, 16-74-year-olds	2,178	1,179
No. of completed interviews, 18-66-year-olds	1,978	1,067
No. of answers corrected for errors, 18-66-year-olds	84	81
Accepted min/max amount for firm:		
- Minor repairs	SEK 0-64,000	NOK 100-60,000
- Major improvements	SEK 0-1.16 million	NOK 200-1.0 million
Accepted min/max amount for others:		
- Minor repairs	SEK 0-64,000	NOK 100-60,000
- Major improvements	SEK 0-1.16 million	NOK 200-1.0 million
<u>18-66-year-olds:</u>		
No. with minor repairs	891	608
No. with major improvements	234	161
No. by DIY, minor repairs	798	538
No. by DIY, major improvements	171	139
No. by DIY, either minor repairs or major improvements or both	871	586
Proportion of interviews carried out where minor repairs and major improvements are by DIY	44%	55%
No. who have disclosed expenses for firm		
- Minor repairs	215	181
- Major improvements	115	76
Conversion of average value to macro figures	- Correction for households with more than one adult - Owner-occupiers and tenants listed separately	

Continued

DATA COLLECTION		
Collected in	GB	Germany
Omnibus survey	2000 Office for National Statistics	2001 Infratest Sozialforschung
Method	Face-to-face interview	Face-to-face interview
Carried out	Apr. 00	All in 2001: 5/4-27/4, 31/5-28/6, 30/7-16/8, 9/8-30/8, 9/10-24/10.
Covers DIY over 12 months	Apr. 99-Apr. 00	Apr. 00- Oct. 01
No. of respondents	3,000	9,706
No. with telephone	•	•
Total number of interviews carried out	1,757	6,396
No. of completed interviews, 16-74-year-olds	1,574	5,683
No. of completed interviews, 18-66-year-olds	1,366	4,912
No. of answers corrected for errors, 18-66-year-olds	134	142
Accepted min/max amount for firm:		
- Minor repairs	GBP 10-5,000	DEM 50-20,000
- Major improvements	GBP 10-90,000	DEM 50-250,000
Accepted min/max amount for others:		
- Minor repairs	GBP 10-5,000	DEM 50-20,000
- Major improvements	GBP 10-90,000	DEM 50-250,000
<u>18-66-year-olds:</u>		
No. with minor repairs	757	1,786
No. with major improvements	203	316
No. by DIY, minor repairs	476	1,483
No. by DIY, major improvements	58	184
No. by DIY, either minor repairs or major improvements or both	491	1,603
Proportion of interviews carried out where minor repairs and major improvements are by DIY	36%	33%
No. who have disclosed expenses for firm		
- Minor repairs	357	300
- Major improvements	146	167
Conversion of average value to macro figures	- Correction for households with more than one adult - Owner-occupiers and tenants listed separately	

Appendix C: The questionnaire

The Rockwool Foundation Research Unit's surveys of DIY activities are unique from an international point of view, in that the same core of questions have been asked in a more or less identical way in 10 (11 if the more limited questions in the 1988 survey are included) interview surveys over an 8-year (13-year) period, from 1993 (1988) to 2001. Six (7) of the surveys have been carried out in Denmark, and the remaining four in Sweden, Norway, Great Britain and Germany. As mentioned above, the formulation of the central core of questions differs only slightly from country to country, so the following is based on the questions from the 2000 survey in Great Britain.

Minor repairs or maintenance

Q_1. In the past 12 months, have you had any small scale repair or maintenance jobs carried out on your accommodation; for example, painting and decorating, plumbing, electrical repair works etc.?

Yes or No

Q_2. Thinking now of the total value of all the small scale repairs and maintenance work carried out in the past 12 months, how much of this work was carried out by a firm that gave you/will give you a receipt?

Enter a percentage between 0-100

Q_3. Thinking still of the total value of all the small scale repairs and maintenance work carried out in the past 12 months, how much of this work was carried out by you or others in your household?

Enter a percentage between 0-100

Q_4. And thinking still of the total value of all the small scale repairs and maintenance work carried out in the past 12 months; how much of this work was carried out by people outside your household who did not/ will not give you a receipt?

Enter a percentage between 0-100

Q_5. Approximately how much did you pay/will you have to pay in total to the firm (that gave you/will give you a receipt) for doing this work?

Enter a value in 10-5,000 £

Q_6. Approximately how much did you pay/will you have to pay in total to people outside the household (without a receipt) for doing this work?

Enter a value in 10-5,000 £

Major improvements or changes

Q_7. In the past 12 months, have you had any larger scale improvements or changes made to your accommodation, for example any rebuilding; installing central heating; adding a garage or having a loft conversion?
Yes or No

Q_8. Thinking now of the total value of all the larger scale improvements or changes carried out in the past 12 months; how much of this work was carried out by a firm that gave you/will give you a receipt?
Enter a percentage between 0-100

Q_9. Thinking still of the total value of all the larger scale improvements or changes carried out in the past 12 months; how much of this work was carried out by you or others in your household?
Enter a percentage between 0-100

Q_10. And thinking still of the total value of all the larger scale improvements or changes carried out in the past 12 months; how much of this work was carried out by people outside your household who did not/ will not give you a receipt?
Enter a percentage between 0-100

Q_11. Approximately how much did you pay/will you have to pay in total to the firm (that gave you/will give you a receipt) for doing this work?
Enter a value in 10-90,000 £

Q_12. Approximately how much did you pay/will you have to pay in total to people outside the household (without a receipt) for doing this work?
Enter a value in 10-90,000 £

Apart from giving an idea of the extent of DIY activities, the above questions have also served as an introduction to a series of direct questions on the supply of work in the so-called black market, i.e. taxable work within the production boundary of the national accounts which has evaded taxation ("underground production"). These surveys have been reported in a number of publications from the Rockwool Foundation Research Unit, the latest being in Søren Pedersen (2003).

The aim of the questions in the Unit's surveys is to measure the value of DIY production in work on the home through a direct measurement of output values for the household's purchases of corresponding services in the market. This differs from most of the Danish and international studies of DIY activities and other non-market household production, which take a starting point in time use

studies. Based on households' time use, this type of study calculates, where possible, the production value from the input side, according to a method corresponding to the calculation of the production value of non-market general government production in the national accounts.

In four of the surveys, supplementary questions have been asked to try to determine both the motivation for carrying out DIY and the kind of home repairs and maintenance and improvements carried out. The questions on motivation were asked in the three Danish surveys in 1993/94, 2000 and 2001, though in the 1993/94 survey the questions were limited to the motivation for carrying out minor repairs and maintenance in the respondent's own home. The questions were as follows:

After question 6 and 12 respectively, the following questions were put to all respondents who had answered yes to having carried out minor repairs and maintenance or major improvements:

If the household has carried out a lot of the repairs or improvements itself, is it:

(Choose one answer only)
1. Mainly because you enjoy carrying out repairs and maintenance?
2. Mainly to save money?
3. A combination of both?
4. Other. Please specify: _____

The questions varied slightly in the German survey in 2000. Answer 3 *"A combination of both"* was replaced by two new choices: "Because you can do the work quicker or better yourself" and "Several reasons are equally important".

The questions on the kind of DIY carried out have only been asked in the Danish survey in June 2001, and were put to all respondents who had had work done on the home either as DIY and/or by a firm or others outside the household, invoiced or non-invoiced. The question was open, allowing the respondent to specify different kinds of work, and was asked about minor repairs and maintenance and major improvements respectively.

"What work of this kind have you had carried out within the last 12 months?"

The various types of work were then coded and classified into 22 categories. The question was placed inside the question on invoiced expenses from a firm or non-invoiced expenses from others.

Finally, for the sake of completeness, it should be mentioned that all the surveys involved work on own permanent dwelling. Work on own second home (holiday cottage) was also included in the 1988 and 1993/94 surveys, but has been

excluded from the calculations in comparisons of the value of DIY with the later surveys. However, the results of the 1993/94 survey regarding second homes are briefly mentioned in the section on the importance of home equity for the spread of DIY.

Appendix D: Error correction

The respondents had little difficulty in saying whether they had had minor repairs and maintenance or major improvements carried out on the home during the last 12 months. It proved more difficult to specify the percentage of each of the three answer categories, however: Work done by a firm and invoiced, by the household itself, or by others outside the household and non-invoiced. The number of obvious insufficiencies in the answers to these questions vary from survey to survey, partly depending on the interviewer instructions and the technical quality of the telephone interviews. The methods used to correct for insufficient answers are described in the following.

If the respondent answered yes to minor or major work on the home, but the specified percentages for minor repairs and maintenance or major improvements do not add up to 100%, the answers are assessed on an individual basis and the error corrected – either in the form of a residual calculation of missing answer categories or scaling of the answers so that they sum to 100%. If the respondent answered yes to the work and specified an amount for a firm and/or "others", but not a percent distribution, this is assigned on the basis of the specified amount, according to pre-determined distribution norms (see Appendix table D1).

The disclosed amounts for payment for invoiced work by a firm or non-invoiced work by others outside the household was also checked for errors and corrected where required.

If the specified amount for expenses for a firm or "others" was extremely high or improbably low, this was corrected. If the amounts for minor repairs were below a fixed, very low, limit, the answer was regarded as "not stated" and the rules for this were then followed, cf. below. This was based on the assumption that, in cases where expenses for a firm were specified at, for example, DKK 2, it was probably because the respondent had forgotten two or more zeroes, and that it should have been DKK 200 or DKK 2000. If the amounts for major improvements are below the (high) lower limit for the cost of this type of work, the answer is transferred to minor repairs and maintenance, and the rules for this area were then followed.

If the amount for the cost of minor repairs and maintenance were above the fixed upper limit, the answer was transferred to major improvements. If the amounts for major improvements were above the (high) upper limit for this type of work (DKK 1 million in the latest Danish surveys), the answer was regarded as *amount not stated*. This concerned only a few answers in each survey, however.

If the respondent had specified a percent distribution, and a percentage was stated for work carried out by a firm and/or others, but the amount was not stated, the following was done: A value in relation to the specified percentage

was assigned, based on the average value per percentage point for all the answers where the value was specified.

If the respondent had answered yes to either minor repairs and maintenance and/or major improvements, but both the percent distribution for those who did the work and the amounts were filled in with combinations of blank, zero and don't know, the respondent was left out of this analysis. If the answers for the percent distribution and amounts alone were zero and/or blank, the answer was regarded as a no to minor repairs and/or major improvements.

If the respondent had answered yes to both minor repairs and major improvements, but a percent distribution and amount was only filled in for one of the two categories, the answers were corrected to a "yes" for this category of work but a "no" for the category where there was neither a percent distribution nor amount.

The amount limits used and number of corrected answers can be seen in Appendix B. The number of corrected answers was typically between 2-10% of all interviews in the various surveys. This suggests that minor differences in the way of asking the same question, differences in interviewer instructions, and differences in the technical facilities in the telephone interviews have played a certain role in the quality of the answers, but we do not think this has had any systematic effect on the results. There are mainly variations in quality from country to country, and only to a lesser extent between the various Danish surveys.

The rules used for correcting errors for the surveys in Norway, the GB and Germany are shown in appendix table D1, which also shows the number of answers corrected according to the rule in question.

Appendix table D1: List of possible errors in the international DIY surveys

	Controlled in:			
Possible error	**GB**	**Germany**	**Norway**	**Error correction**
Answered yes to minor repairs, but the percentages do not add up to 100 %.	X (Yes, 15)	X (Yes, 1)	X (Yes, 2)	Possible errors are assessed individually and corrected manually. Scaling is carried out for Norway.
Answered yes to major repairs, but the percentages do not add up to 100 %.	X (Yes, 1)	X (No)	X (No)	Possible errors are assessed individually and corrected manually. Scaling is carried out for Norway.
Answered yes to minor and major repairs, but the percentages for at least one of the categories do not add up to 100 %.	•	X (No)	•	Possible errors are assessed individually and corrected manually. Scaling is carried out for Norway.
Extreme amount. Small firm.	X (Yes, 26)	X (Yes, 3)	X (Yes, 12)	If the amount is under the fixed limit, the answer is regarded as not stated. If it is over the set limit, the answer is corrected to appear as if it concerns a major improvement instead.
Extreme amount. Smaller others.	X (Yes, 68)	X (Yes, 1)	X (Yes, 18)	If the amount is under the fixed limit (including if it is zero), the answer is regarded as not stated. If it is over the set limit, the answer is corrected to appear as if it concerns a major improvement instead.
Extreme amount. Large firm.	X (Yes, 6))	X (Yes, 1)	X (Yes, 3)	If the amount is under the fixed limit (including if it is zero), the answer is corrected to appear as though it concerns a minor repair instead. If the amount is over the fixed limit, the answer is regarded as not stated.
Extreme amount. Larger others.	X (Yes, 10)	X (No)	X (Yes, 10)	If the amount is under the fixed limit (including if it is zero), the answer is corrected to appear as though it concerns a minor repair instead. If the amount is over the fixed limit, the answer is regarded as not stated.
Specifies a percentage for small firm, but there is no amount, don't know, or no answer.	X (Yes, 4)	X (Yes, 20)	X (Yes, 15)	The respondents are allocated the average value per per-centage point for all who have answered.

Continued

Specifies a percentage for smaller others, but there is no amount, don't know, or no answer.	X (No)	X (Yes, 5)	X (Yes, 2)	The respondents are allocated the average value per per-centage point for all who have answered.
Specifies a percentage for large firm, but there is no amount, don't know, or no answer.	X (Yes, 1)	X (Yes, 19)	X (Yes, 4)	The respondents are allocated the average value per per centage point for all who have answered.
Specifies a percentage for larger others, but there is no amount, don't know, or no answer.	X (No)	X (Yes, 8)	X (Yes, 1)	The respondents are allocated the average value per per centage point for all who have answered.
Answered yes to small repairs and no to major repairs, but there are no percentages or amounts for major repairs.	X (No)	X (Yes, 8)	X (No)	Since there are only "don't know" or "0" answers for major repairs, this information is omitted.
Answered yes to major repairs and no to minor repairs, but there are no percentages or amounts for minor repairs.	X (No)	X (No)	X (No)	
Answered yes to minor repairs and "don't know", "0", or "no answer" instead of percentages for the three categories for minor repairs.	X (No)	X (Yes, 26)	Yes (Yes, 1)	A percentage distribution is assigned based on the following order: Self, Firm, Others: If no amount has been stated, we proceed to the next error type. If there are only amounts for firm: 20, 80, 0 If there are only amounts for others: 20, 0, 80 If there are amounts for both firm and others: 20, 40, 40
Answered yes to major improvements and "don't know", "0" or "no answer" instead of percentages for the three categories for major repairs.	X (No)	X (Yes, 4)	X (No)	----//----
Answered yes to both minor repairs and major improvements, and "don't know", "0" or "no answer" instead of percentages for the three categories for either minor repairs or major improvements.	•	X (Yes, 3)	•	----//----

Continued

Answered yes to both minor repairs and major improvements, and “don’t know” or “no answer” instead of one of the percentages for the three categories for either minor repairs or major improvements. But the percentages add up to 100.	•	X (Yes, 1)	•	Since the other percentages add up to 100, “don’t know”, or “no answer” are regarded as blank answers.
Answered yes to minor repairs, but answered ”0” or blank to both the amount and percentage categories.	X (Yes, 1)	X (Yes, 13)	X (Yes, 3)	The person is regarded as having answered: Neither major nor minor repairs.
Answered yes to minor repairs, but answered “0”, “don’t know”, “no answer” or “blank” to both the amount and percentage categories (and not blank to all).	•	X (Yes, 6)	•	The persons are omitted.
Answered yes to major repairs, but answered blank to both the amount and percentage categories.	X (Yes, 2)	X (Yes, 3)	X (Yes, 1)	The person is regarded as having answered: Neither major nor minor repairs.
Answered yes to major repairs, but answered “0”, “don’t know”, “no answer ” or “blank” to both the amount and percentage categories (and not blank to all).	•	X (No)	•	The persons are omitted.
Answered yes to minor and major repairs, but blank to both the amount and percentage categories for minor repairs	•	X (Yes, 3)	•	The person is regarded as having only answered yes to major improvements.
Answered yes to minor and major repairs, but blank to both the amount and percentage categories for major improvements.	•	X (Yes, 8)	•	The person is regarded as having only answered yes to minor repairs.
Answered yes to minor and major repairs, but blank to both the amount and percentage categories for minor repairs and major improvements.	•	X (Yes, 8)	•	The person is regarded as having answered: Neither major nor minor repairs.
Answered yes to minor and major repairs, but “0”, “don’t know”, “no answer ” or “blank” to both the amount and percentage categories (and not blank to all).	•	X (Yes, 1)	•	The persons are omitted.

Appendix E: Detailed and supplementary tables

Appendix table E1: Proportion who answered yes to having had home repairs or improvements carried out within the last 12 months. Weighted distribution[1)]

		Minor repairs and maintenance		Major improvements and changes	
		%	N[2)]	%	N[2)]
DK	1988	58	…	15	…
DK	1993/94	55	2,216	14	583
DK	1996	58	795	15	226
DK	1997	58	518	20	183
DK	1998	56	492	18	161
DK	2000	46	409	21	194
DK	2001	44	358	21	171
S	1997/98	45	891	12	234
N	1998	57	608	15	161
GB	2000	56	757	15	204
D	2001	39	1,786	7	316

1) By weighted distribution is meant the following: The Danish surveys have been weighted in order to correct the sample for any non-response in relation to the representative selection. The statistical offices in Norway and Sweden consider such weighting to be unnecessary. In Germany and the GB, the sample is selected by households, which are therefore weighted to persons. The German survey is also weighted for representativeness in the sample.

2) N = observations from the non-weighted distribution, which is why the percentage distribution does not wholly correspond to the number of observations.

Appendix table E2: Proportion of home repairs and improvements carried out by a firm and invoiced, by the household itself or other persons outside the household and non-invoiced. Weighted distribution[1)]

		Minor repairs and maintenance	Major improvements and changes
		%[2)]	%[2)]
	Carried out by firm and invoiced:		
DK	1988	16	35
DK	1993/94	21	54
DK	1996	24	46
DK	1997	25	48
DK	1998	26	57
DK	2000	21	45
DK	2001	20	41
S	1997/98	14	36
N	1998	18	29
GB	2000	34	67
D	2001	14	50
	Carried out by the household itself:		
DK	1988	79	55
DK	1993/94	76	42
DK	1996	73	49
DK	1997	71	47
DK	1998	69	38
DK	2000	75	48
DK	2001	75	54
S	1997/98	80	58
N	1998	79	69
GB	2000	51	23
D	2001	80	46
	Carried out by other persons outside the household and non-invoiced:		
DK	1988	5	10
DK	1993/94	3	4
DK	1996	3	6
DK	1997	4	5
DK	1998	5	4
DK	2000	4	7
DK	2001	5	5
S	1997/98	5	6
N	1998	2	2
GB	2000	15	10
D	2001	6	5

1) By weighted distribution is meant the following: The Danish surveys have been weighted in order to correct the sample for any non-response in relation to the representative selection. The statistical offices in Norway and Sweden consider such weighting to be unnecessary. In Germany and the GB, the sample is selected by households, which are therefore weighted to persons. The German survey is also weighted for representativeness in the sample.

2) Due to rounding, the sum of percentages can be different from 100.

Appendix table E3: Proportion of persons who have had work carried out on the home in the last 12 months, by owner-occupiers and tenants. Weighted distribution[1)]

	Owner-occupier		Tenant	
	%	N[2)]	%	N[2)]
Have had work carried out on the home:				
Denmark 1996:				
- minor repairs and maintenance	63	626	50	169
- major improvements and extensions	21	213	3	13
Denmark 1997:				
- minor repairs and maintenance	66	430	39	88
- major improvements and extensions	25	165	8	18
Denmark 1998:				
- minor repairs and maintenance	67	408	34	84
- major improvements and extensions	24	150	4	11
Denmark 2000				
- minor repairs and maintenance	53	357	26	52
- major improvements and extensions	28	187	3	7
Denmark 2001				
- minor repairs and maintenance	53	311	21	47
- major improvements and extensions	28	162	4	9
Sweden 1997/1998:				
- minor repairs and maintenance	57	731	23	160
- major improvements and extensions	17	214	3	20
Norway 1998				
- minor repairs and maintenance	63	544	32	64
- major improvements and extensions	17	149	6	12
GB 2000				
- minor repairs and maintenance	64	641	32	116
- major improvements and extensions	19	193	3	11
Germany 2001				
- minor repairs and maintenance	47	866	33	920
- major improvements and extensions	12	237	3	79

1) By weighted distribution is meant the following: The Danish surveys have been weighted in order to correct the sample for any non-response in relation to the representative selection. The statistical offices in Norway and Sweden consider such weighting to be unnecessary. In Germany and the GB, the sample is selected by households, which are therefore weighted to persons. The German survey is also weighted for representativeness in the sample.

2) N = observations from the non-weighted distribution, which is why the percentage distribution does not wholly correspond to the number of observations.

Appendix table E4: Work on the home, by who has carried it out, and by owner-occupiers and tenants. Weighted distribution[1)]

	Owner-occupier	Tenant
	%[2)]	%[2)]
Denmark 1996:		
Minor repairs and maintenance. Carried out by:		
- firm, invoiced	22	27
- the household itself	75	69
- others outside the household	2	4
Major improvements and extensions. Carried out by:		
- firm, invoiced	46	47
- the household itself	48	53
- others outside the household	6	0
Denmark 1997:		
Minor repairs and maintenance. Carried out by:		
- firm, invoiced	23	33
- the household itself	73	63
- others outside the household	4	4
Major improvements and extensions. Carried out by:		
- firm, invoiced	46	64
- the household itself	49	29
- others outside the household	5	7
Denmark 1998:		
Minor repairs and maintenance. Carried out by:		
- firm, invoiced	24	34
- the household itself	72	58
- others outside the household	4	8
Major improvements and extensions. Carried out by:		
- firm, invoiced	55	81
- the household itself	40	18
- others outside the household	4	0
Denmark 2000:		
Minor repairs and maintenance. Carried out by:		
- firm, invoiced	23	10
- the household itself	73	84
- others outside the household	4	6
Major improvements and extensions. Carried out by:		
- firm, invoiced	45	43
- the household itself	49	39
- others outside the household	7	18
Denmark 2001:		
Minor repairs and maintenance. Carried out by:		
- firm, invoiced	21	18
- the household itself	75	75
- others outside the household	4	7
Major improvements and extensions. Carried out by:		
- firm, invoiced	41	38
- the household itself	54	53
- others outside the household	5	9

Continued

	Owner-occupier	Tenant
	%[2)]	%[2)]
Sweden 1997/1998:		
Minor repairs and maintenance. Carried out by:		
- firm, invoiced	16	9
- the household itself	80	82
- others outside the household	4	9
Major improvements and extensions. Carried out by:		
- firm, invoiced	37	29
- the household itself	58	59
- others outside the household	5	13
Norway 1998:		
Minor repairs and maintenance. Carried out by:		
- firm, invoiced	18	18
- the household itself	80	77
- others outside the household	2	4
Major improvements and extensions. Carried out by:		
- firm, invoiced	29	31
- the household itself	69	69
- others outside the household	3	0
GB 2000:		
Minor repairs and maintenance. Carried out by:		
- firm, invoiced	36	24
- the household itself	51	49
- others outside the household	13	27
Major improvements and extensions. Carried out by:		
- firm, invoiced	68	56
- the household itself	24	6
- others outside the household	8	38
Germany 2001:		
Minor repairs and maintenance. Carried out by:		
- firm, invoiced	20	8
- the household itself	74	86
- others outside the household	6	6
Major improvements and extensions. Carried out by:		
- firm, invoiced	52	41
- the household itself	43	56
- others outside the household	5	3

1) By weighted distribution is meant the following: The Danish surveys have been weighted in order to correct the sample for any non-response in relation to the representative selection. The statistical offices in Norway and Sweden consider such weighting to be unnecessary. In Germany and the GB, the sample is selected by households, which are therefore weighted to persons. The German survey is also weighted for representativeness in the sample.

2) Due to rounding, the sum of percentages can be different from 100.

Appendix Table E5: Distribution of major and minor repairs, by owner-occupiers and tenants. Weighted distribution[1)]

	Both minor repairs and major improvements	Only minor repairs	Only major improve-ments	Neither minor improvements nor major repairs	Total
	---------- %[2)] ----------				N[3)]
Denmark 1988[4)]					
- Owner-occupiers	16	50	4	30	2,077
- Tenants	7	44	2	48	1,482
- Total	12	47	3	37	3,559
Denmark 1993/1994[4)]					
- Owner-occupiers	12	51	6	31	2,380
- Tenants	5	38	4	53	1,604
- Total	9	46	5	40	3,984
Denmark 1996					
- Owner-occupiers	13	50	9	29	973
- Tenants	1	48	2	48	374
- Total	8	49	6	36	1,347
Denmark 1997					
- Owner-occupiers	13	53	12	21	647
- Tenants	4	35	4	57	222
- Total	10	48	10	32	869
Denmark 1998					
- Owner-occupiers	14	53	10	23	611
- Tenants	2	32	2	64	242
- Total	10	46	8	36	853
Denmark 2000					
- Owner-occupiers	12	41	16	31	657
- Tenants	0	26	3	71	202
- Total	9	37	12	42	859
Denmark 2001					
- Owner-occupiers	11	42	17	30	584
- Tenants	1	20	3	76	213
- Total	8	35	13	44	797

Continued

	Both minor repairs and major improvements	Only minor repairs	Only major improve-ments	Neither minor improvements nor major repairs	Total
	---------- %[2] ----------				N[3]
Sweden 1997/1998					
- Owner-occupiers	9	48	7	35	1,275
- Tenants	2	22	1	76	691
- Total	7	39	5	50	1,966
Norway 1998					
- Owner-occupiers	11	52	6	31	865
- Tenants	5	27	1	67	202
- Total	10	47	5	38	1,067
GB 1998					
- Owner-occupiers	13	50	6	31	1,019
- Tenants	1	31	1	67	347
- Total	11	46	5	39	1,366
Germany 1998					
- Owner-occupiers	5	42	7	46	1,907
- Tenants	1	32	2	65	3,005
- Total	3	36	4	57	4,912

1) By weighted distribution is meant the following: The Danish surveys have been weighted in order to correct the sample for any non-response in relation to the representative selection. The statistical offices in Norway and Sweden consider such weighting to be unnecessary. In Germany and the GB, the sample is selected by households, which are therefore weighted to persons. The German survey is also weighted for representativeness in the sample.

2) Due to rounding, the sum of percentages can be different from 100.

3) N = observations from the non-weighted distribution, which is why the percentage distribution does not wholly correspond to the number of observations.

4) In the surveys from 1988 and 1993/94, co-operative housing are regarded as rented accommodation, but in all the following surveys as owner-occupied dwellings.

Appendix table E6: Relative significance of DIY activities. Weighted distribution [1)]

	Percentage of the total work carried out as DIY by the household			
	Minor repairs		Major repairs	
	%[2)]	N[3)]	%[2)]	N[3)]
Denmark 1993/1994				
0	15	…	46	…
1-39	6	…	7	…
40-59	6	…	8	…
60-99	8	…	10	…
100	65	…	29	…
Total	100	2,216	100	583
Denmark 1996-2001				
0	16	382	32	304
1-39	7	172	15	141
40-59	8	201	11	102
60-99	12	290	13	121
100	57	1,527	28	267
Total	100	2,572	100	935
Sweden 1997/1998				
0	10	93	27	63
1-39	6	49	12	28
40-59	6	51	8	18
60-99	10	89	11	26
100	68	609	42	99
Total	100	891	100	234
Norway 1998				
0	12	70	14	22
1-39	5	31	12	20
40-59	7	40	9	14
60-99	10	63	17	28
100	65	404	48	77
Total	100	608	100	161
GB 2000				
0	35	281	70	145
1-39	11	85	5	10
40-59	6	48	4	9
60-99	14	108	5	10
100	34	235	16	29
Total	100	757	100	203
Germany 2001				
0	16	303	43	132
1-39	3	55	7	24
40-59	2	30	7	17
60-99	4	60	5	19
100	76	1,338	37	124
Total	100	1,786	100	316

1) By weighted distribution is meant the following: The Danish surveys have been weighted in order to correct the sample for any non-response in relation to the representative selection. The statistical offices in Norway and Sweden consider such weighting to be unnecessary. In Germany and the GB, the sample is selected by households, which are therefore weighted to persons. The German survey is also weighted for representativeness in the sample.

2) Due to rounding, the sum of percentages can be different from 100.

2) N = observations from the non-weighted distribution, which is why the percentage distribution does not wholly correspond to the number of observations.

Appendix table E7: Proportion of all respondents who have not carried out DIY

		Tenants		Owner-occupiers	
		%	N	%	N
DK	1988	…	…	…	…
DK	1993/94	…	…	…	…
DK	1996-2001	71	891	39	1339
S	1997/98	79	552	43	555
N	1998	70	148	38	333
GB	2000	80	278	58	596
D	2001	72	2,178	59	1,131

Appendix table E8: Average payment (DKK) for minor repairs and maintenance in the previous 12 months, all owner-occupiers and tenants[1)]

	Tenants	Owner-occupiers	All	Tenants	Owner-occupiers	All
		DKK			No. of observations[2)]	
Denmark 1993/1994						
- Firm	678	2,509	…	117	402	519
- Other persons	28	22	…	71	89	160
- Total	706	2,531	…	1,642	2,407	4,049
Denmark 1996						
- Firm	462	1,650	1,199	30	171	201
- Other persons	32	100	74	11	56	67
- Total	494	1,750	1,273	374	973	1,347
Denmark 1997						
- Firm	1,209	2,864	2,358	29	151	180
- Other persons	31	347	251	8	48	56
- Total	1,240	3,211	2,609	222	647	869
Denmark 1998						
- Firm	1,417	3,258	2,673	33	155	188
- Other persons	307	550	473	13	49	62
- Total	1,724	3,808	3,146	242	611	853
Denmark 2000						
- Firm	474	3,155	2,446	11	136	147
- Other persons	63	139	119	2	11	13
- Total	537	3,294	2,565	202	657	859
Denmark 2001						
- Firm	405	2,536	1,919	10	96	106
- Other persons	58	45	49	4	8	12
- Total	463	2,581	1,968	213	584	797
Sweden 1997/1998						
- Firm	160	2,095	1,409	25	190	215
- Other persons	10	149	99	9	44	53
- Total	170	2,244	1,508	701	1,277	1,978
Norway 1998						
- Firm	1,450	2,508	2,308	17	164	181
- Other persons	75	143	130	4	27	31
- Total	1,525	2,651	2,438	202	865	1,067
GB 2000						
- Firm	87	221	190	35	322	357
- Other persons	38	65	59	42	173	225
- Total	125	286	249	347	1,019	1,366
Germany-2001						
- Firm	54	437	220	90	210	300
- Other persons	10	56	30	56	58	114
- Total	64	493	250	3,005	1,907	4,912

1) Average in relation to all tenants/owner-occupiers in the sample.
2) Indicates the number of observations where details of expenses were given; 'Total' indicates the total number of observations in the survey.

Appendix table E9: Average payment (DKK) for major improvements in the previous 12 months, all owner-occupiers and tenants[1)]

	Tenants	Owner-occupiers	All	Tenants	Owner-occupiers	All
	DKK			No. of observations[2)]		
Denmark 1993/1994						
- Firm	…	…	…	…	…	…
- Other persons	…	…	…	…	…	…
- Total	…	…	…	…	…	…
Denmark 1996						
- Firm	2,242	7,903	5,752	7	118	125
- Other persons	0	142	88	0	29	29
- Total	2,242	8,045	5,840	374	973	1,347
Denmark 1997						
- Firm	1,487	12,640	9,231	9	93	102
- Other persons	5	430	300	2	19	21
- Total	1,492	13,070	9,531	222	647	869
Denmark 1998						
- Firm	1,597	13,997	10,056	9	109	118
- Other persons	23	1,206	830	1	25	26
- Total	1,620	15,203	10,886	242	611	853
Denmark 2000						
- Firm	744	19,634	14,640	4	117	121
- Other persons	114	364	298	1	16	17
- Total	858	19,998	14,938	202	657	859
Denmark 2001						
- Firm	757	16,131	11,679	4	84	88
- Other persons	9	886	632	1	15	16
- Total	766	17,017	12,311	213	584	797
Sweden 1997/1998						
- Firm	414	5,379	3,619	7	108	115
- Other persons	29	251	172	4	20	24
- Total	443	5,630	3,791	701	1,277	1,978
Norway 1998						
- Firm	2,317	7,166	6,248	5	71	76
- Other persons	0	133	108	0	13	13
- Total	2,317	7,299	6,356	202	865	1,067
GB 2000						
- Firm	100	997	778	5	141	146
- Other persons	3	14,539	11,233	5	36	41
- Total	103	15,536	12,011	347	1,019	1,366
Germany-2001						
- Firm	346	2,417	1,245	29	138	167
- Other persons	5	74	35	5	20	25
- Total	351	2,491	1,280	3,005	1,907	4,912

1) Average in relation to all tenants/owner-occupiers in the sample.
2) Indicates the number of observations where details of expenses were given; 'Total' indicates the total number of observations in the survey.

Appendix table E10: Reason for households to carry out a lot of the minor repairs themselves. Weighted distribution[1)]

	%[2)]	N[3)]
Denmark 1993/1994		
Mainly because they like carrying out repairs and improvements	17	335
Mainly to save money	22	416
A combination of both	61	1,137
Other reasons	1	10
Total	100	1,898
Denmark 2000		
Mainly because they like carrying out repairs and improvements	20	71
Mainly to save money	24	84
A combination of both	54	191
Other reasons	2	9
Total	100	355
Denmark 2001		
Mainly because they like carrying out repairs and improvements	15	45
Mainly to save money	25	78
A combination of both	60	185
Other reasons	1	2
Total	100	310
Germany 2001		
Mainly because they like carrying out repairs and improvements	10	141
Mainly to save money	59	878
Mainly because they think they can do the work quicker or better themselves	14	204
Several reasons are equally important	16	230
Other reasons	2	26
Total	100	1,479

1) By weighted distribution is meant the following: The Danish surveys have been weighted in order to correct the sample for any non-response in relation to the representative selection. In Germany, the sample is selected by households, which are therefore weighted to persons. The survey is also weighted for representativeness in the sample.
2) Due to rounding, the sum of percentages can be different from 100.
3) N = observations from the non-weighted distribution, which is why the percentage distribution does not wholly correspond to the number of observations.

Appendix table E11: Reason for households to carry out a lot of the major repairs themselves. Weighted distribution[1)]

	%[2)]	N[3)]
Denmark 2000		
Mainly because they like carrying out repairs and improvements	11	16
Mainly to save money	24	37
A combination of both	62	95
Other reasons	3	6
Total	100	154
Denmark 2001		
Mainly because they like carrying out repairs and improvements	12	15
Mainly to save money	27	38
A combination of both	60	85
Other reasons	1	1
Total	100	139
Germany 2001		
Mainly because they like carrying out repairs and improvements	6	10
Mainly to save money	61	114
Mainly because they think they can do the work quicker or better themselves	7	14
Several reasons are equally important	23	33
Other reasons	3	9
Total	100	180

1) By weighted distribution is meant the following: The Danish surveys have been weighted in order to correct the sample for any non-response in relation to the representative selection. In Germany, the sample is selected by households, which are therefore weighted to persons. The survey is also weighted for representativeness in the sample.
2) Due to rounding, the sum of percentages can be different from 100.
3) N = observations from the non-weighted distribution, which is why the percentage distribution does not wholly correspond to the number of observations.

Appendix table E12: Reason for households to carry out a lot of the minor repairs themselves, by who has done the work. Weighted distribution[1)]

	Mainly because they like carrying out repairs and improvements	Mainly to save money	A combination of both	Other reasons
Denmark 1993/1994				
Proportion of minor repairs and improvements carried out by:	---------- %[2)] ----------			
Firm, invoiced	7	9	8	10
The household itself	91	87	90	90
Others outside the household	2	3	2	0
Total	100	100	100	100
	---------- N[3)] ----------			
Total observations	335	416	1,137	10
Denmark 2000				
Proportion of minor repairs and improvements carried out by:	---------- %[2)] ----------			
Firm, invoiced	5	13	12	14
The household itself	93	81	85	86
Others outside the household	1	6	3	0
Total	100	100	100	100
	---------- N[3)] ----------			
Total observations	71	84	191	9
Denmark 2001				
Proportion of minor repairs and improvements carried out by:	---------- %[2)] ----------			
Firm, invoiced	11	14	8	0
The household itself	89	79	89	100
Others outside the household	0	7	3	0
Total	100	100	100	100
	---------- N[3)] ----------			
Total observations	45	78	185	2

Continued

Germany 2001	Mainly because they like carrying out repairs and improvements	Mainly to save money	Mainly because they think they can do the work quicker or better themselves	Several reasons are equally important	Other reasons
Proportion of minor repairs and improvements carried out by:	---------- %[2] ----------				
Firm, invoiced	6	3	4	3	4
The household itself	93	96	95	94	90
Others outside the household	1	1	1	3	6
Total	100	100	100	100	100
	---------- N[3] ----------				
Total observations	141	878	204	230	26

1) By weighted distribution is meant the following: The Danish surveys have been weighted in order to correct the sample for any non-response in relation to the representative selection. In Germany, the sample is selected by households, which are therefore weighted to persons. The survey is also weighted for representativeness in the sample.
2) Due to rounding, the sum of percentages can be different from 100.
3) N = observations from the non-weighted distribution, which is why the percentage distribution does not wholly correspond to the number of observations.

Appendix table E13: Reason for households to carry out a lot of the major improvements themselves, by who has done the work. Weighted distribution[1)]

	Mainly because they like carrying out repairs and improvements	Mainly to save money	A combination of both	Other reasons
Denmark 2000				
Proportion of major improvements carried out by:		%[2)]		
Firm, invoiced	36	30	31	25
The household itself	63	56	62	72
Others outside the household	1	15	7	4
Total	100	100	100	100
		N[3)]		
Total observations	16	37	95	6
Denmark 2001				
Proportion of major improvements carried out by:		%[2)]		
Firm, invoiced	28	37	24	0
The household itself	67	49	72	100
Others outside the household	5	14	4	0
Total	100	100	100	100
		N[3)]		
Total observations	15	38	85	1

Germany 2001	Mainly because they like carrying out repairs and improvements	Mainly to save money	Mainly because they think they can do the work quicker or better themselves	Several reasons are equally important	Other reasons
Proportion of major improvements carried out by:			%[2)]		
Firm, invoiced	4	10	3	37	1
The household itself	96	85	96	60	79
Others outside the household	0	5	1	4	20
Total	100	100	100	100	100
			N[3)]		
Total observations	10	114	14	33	9

1) By weighted distribution is meant the following: The Danish surveys have been weighted in order to correct the sample for any non-response in relation to the representative selection. In Germany, the sample is selected by households, which are therefore weighted to persons. The survey is also weighted for representativeness in the sample.

2) Due to rounding, the sum of percentages can be different from 100.

3) N = observations from the non-weighted distribution, which is why the percentage distribution does not wholly correspond to the number of observations.

Appendix table E14: Number of observations with minor repairs and maintenance, by type of work and who has carried it out, June 2001

No. of observations	Owner-occupiers (incl. co-operative). No. of observations = 541.				Tenants. No. of observations = 78.			
	100% Firm	100% DIY	100% Others, non-invoiced	Other combi-nations	100% Firm	100% DIY	100% Others, non-invoiced	Other combi-nations
Paint inside and outside, tarring, wallpapering, varnish floors, stripping	10	142	4	54	3	27	0	5
Floor planing, floor, flooring, tiling, clinker	2	8	0	14	0	1	0	0
Various repair work (storm), repair wall, plastering, puttying windows	0	13	0	5	0	0	0	0
New kitchen, installing white goods, kitchen repairs	0	3	0	2	0	0	0	2
New bathroom and toilet, repair work, modernisation	0	7	0	4	0	1	0	1
Repairs of white goods	3	0	0	0	1	0	0	1
Doors and windows	4	13	0	11	0	1	0	0
Renovation, modernisation wash house/scullery, renovation of gable, total renovation, renovation of facade	4	3	0	3	0	1	0	1
Conversion, set wall up, changes to first floor	0	3	0	2	0	0	0	1
Extension, garage, wooden terrace, patio, greenhouse, woodshed	0	5	0	1	0	0	0	0
New roof, roof repairs, barge boards, fascia boards	4	3	0	1	0	0	0	0
Put listels up, make shelves, cupboards, new ceilings, panelling	0	8	0	3	0	2	0	0
Installation of burner, wood stove, repairs, solar energy	4	1	0	5	0	0	0	0
Lay tiles (outside), laying out a garden, stonework, laid out a terrace, driveway, hedge	2	6	0	4	0	0	0	0
Water pipes, taps, gaskets, fitting radiators	1	3	0	6	1	0	0	2
Plumbing and heating/smithing	12	14	1	18	0	0	0	3
Bricklaying	2	9	0	7	0	0	0	1
Carpentry/joinery	4	21	1	11	1	2	0	0
Painting	0	40	1	13	0	13	1	3
Electrical work, electrical installations	1	1	0	6	1	0	1	0
Glazing	2	0	0	0	0	0	0	0
Other and not stated (drainage system, sewers)	0	1	0	5	1	0	0	0
Total	55	304	7	175	8	48	2	20

Appendix table E15: Minor repairs and maintenance, %, by type of work, June 2001

Percent distribution, column	Owner-occupiers (incl. co-operative). No. of observations = 545.				Tenants. No. of observations = 78.			
	100% Firm	100% DIY	100% Others, non-invoiced	Other Combi-nations	100% Firm	100% DIY	100% Others, non-invoiced	Other Combi-nations
	% [2]							
Paint inside and outside, tarring, wallpapering, varnish floors, stripping	18	47	57	31	38	56	0	25
Floor planing, floor, flooring, tiling, clinker	4	3	0	8	0	2	0	0
Various repair work (storm), repair wall, plastering, puttying windows	0	4	0	3	0	0	0	0
New kitchen, installing white goods, kitchen repairs	0	1	0	1	0	0	0	10
New bathroom and toilet, repair work, modernisation	0	2	0	2	0	2	0	5
Repairs of white goods	5	0	0	0	13	0	0	5
Doors and windows	7	4	0	6	0	2	0	0
Renovation, modernisation wash house/scullery, renovation of gable, total renovation, renovation of facade	7	1	0	2	0	2	0	5
Conversion, set wall up, changes to first floor	0	1	0	1	0	0	0	5
Extension, garage, wooden terrace, patio, greenhouse, woodshed	0	2	0	1	0	0	0	0
New roof, roof repairs, barge boards, fascia boards	7	1	0	1	0	0	0	0
Put listels up, make shelves, cupboards, new ceilings, panelling	0	3	0	2	0	4	0	0
Installation of burner, wood stove, repairs, solar energy	7	0	0	3	0	0	0	0
Lay tiles (outside), laying out a garden, stonework, laid out a terrace, driveway, hedge	4	2	0	2	0	0	0	0
Water pipes, taps, gaskets, fitting radiators	2	1	0	3	13	0	0	10
Plumbing and heating/smithing	22	5	14	10	0	0	0	15
Bricklaying	4	3	0	4	0	0	0	5
Carpentry/joinery	7	7	14	6	13	4	0	0
Painting	0	13	14	7	0	27	50	15
Electrical work, electrical installations	2	0	0	3	13	0	50	0
Glazing	4	0	0	0	0	0	0	0
Other and not stated (drainage system, sewers)	0	0	0	3	13	0	0	0
Total	100	100	100	100	100	100	100	100

1) Due to rounding, the sum of percentages can be different from 100.

Appendix table E16: Number of observations with major improvements and extensions, by type of work and who has carried it out, June 2001

No. of observations	Owner-occupiers (incl. co-operative). No. of observations = 298.			Tenants. No. of observations = 17.		
	100% Firm	100% DIY	Other Combina-tions	100% Firm	100% DIY	Other Combina-tions
Paint inside and outside, tarring, wallpapering, varnish floors, stripping	6	6	3	0	0	1
Floor planing, floor, flooring, tiling, clinker	3	8	4	0	0	0
Various repair work (storm), repair wall, plastering, puttying windows	2	1	0	0	0	0
New kitchen, installing white goods, kitchen repairs	5	12	11	0	1	1
New bathroom and toilet, repair work, modernisation	8	4	13	1	0	0
Repairs of white goods	0	0	0	0	0	0
Doors and windows	7	4	9	0	0	0
Renovation, modernisation wash house/scullery, renovation of gable, total renovation, renovation of facade	8	5	13	2	0	0
Conversion, set wall up, changes to first floor	0	4	4	0	1	0
Extension, garage, wooden terrace, patio, greenhouse, woodshed.	5	9	6	0	0	0
New roof, roof repairs, barge boards, fascia boards	13	3	7	0	0	1
Put listels up, make shelves, cupboards, new ceilings, panelling	0	3	1	0	0	0
Installation of burner, wood stove, repairs, solar energy	2	1	3	0	0	0
Lay tiles (outside), laying out a garden, stonework, laid out a terrace, driveway, hedge	3	8	4	0	0	1
Water pipes, taps, gaskets, fitting radiators	0	0	1	0	0	0
Plumbing and heating/smithing	6	4	7	0	0	1
Bricklaying	4	8	9	0	0	0
Carpentry/joinery	5	14	15	1	1	2
Painting	2	1	7	0	1	1
Electrical work, electrical installations	0	0	5	0	0	1
Glazing	0	0	0	0	0	0
Other and not stated (drainage system, sewers)	0	0	2	0	0	0
Total	79	95	124	4	4	9

Appendix table E17: Major improvements and extensions, %, by type of work, June 2001

Percent distribution, column	Owner-occupiers (incl. co-operative). No. of observations = 298.			Tenants. No. of observations = 17.		
	100% Firm	100% DIY	Other Combina-tions	100% Firm	100% DIY	Other Combina-tions
	% [1]					
Paint inside and outside, tarring, wallpapering, varnish floors, stripping	8	6	2	0	0	11
Floor planing, floor, flooring, tiling, clinker	4	8	3	0	0	0
Various repair work (storm), repair wall, plastering, puttying windows	3	1	0	0	0	0
New kitchen, installing white goods, kitchen repairs	6	13	9	0	25	11
New bathroom and toilet, repair work, modernisation	10	4	11	25	0	0
Repairs of white goods	0	0	0	0	0	0
Doors and windows	9	4	7	0	0	0
Renovation, modernisation wash house/scullery, renovation of gable, total renovation, renovation of facade	10	5	11	50	0	0
Conversion, set wall up, changes to first floor	0	4	3	0	25	0
Extension, garage, wooden terrace, patio, greenhouse, woodshed.	6	10	5	0	0	0
New roof, roof repairs, barge boards, fascia boards	17	3	7	0	0	11
Put listels up, make shelves, cupboards, new ceilings, panelling	0	3	1	0	0	0
Installation of burner, wood stove, repairs, solar energy	3	1	2	0	0	0
Lay tiles (outside), laying out a garden, stonework, laid out a terrace, driveway, hedge	4	8	3	0	0	11
Water pipes, taps, gaskets, fitting radiators	0	0	1	0	0	0
Plumbing and heating/smithing	8	4	6	0	0	11
Bricklaying	5	8	7	0	0	0
Carpentry/joinery	6	15	12	25	25	22
Painting	3	1	6	0	25	11
Electrical work, electrical installations	0	0	4	0	0	11
Glazing	0	0	0	0	0	0
Other and not stated (drainage system, sewers)	0	0	7	0	0	0
Total	100	100	100	100	100	100

1) Due to rounding, the sum of percentages can be different from 100.

Appendix F: Logistical tests

Appendix table F1: Logistic regression of the probability of DIY in Denmark, 1996-2001. 18-74-year-olds [1)]

	Minor repairs		Major improvements	
	Coefficient	Std. deviation	Coefficient	Std. deviation
Constant	0.8662	0.1909	-2.5426	0.3210
Sex:				
Male	0.0828	0.0605	0.0141	0.0918
Female	-	-	-	-
Age	-0.0133	0.0031	-0.0407	0.0051
Marital status				
Married	0.2262	0.0692	0.3246	0.1093
Unmarried	-	-	-	-
Children				
Children under 6	0.1111	0.0809	0.1111	0.1077
No. children under 6	-	-	-	-
Employment				
Self-employed/assisting spouse	0.1810	0.1403	0.0617	0.1909
White-collar worker	0.3499	0.1158	-0.0570	0.1616
Skilled worker	0.3477	0.1153	-0.1043	0.1603
Short-term unemployed	0.0673	0.2444	-0.3356	0.3904
Long-term unemployed	0.1786	0.1986	-0.0782	0.3095
Pensioner/ early retirement benefit	0.0041	0.1417	-0.4106	0.2395
Under education	0.1132	0.1509	-0.2278	0.2214
Other	-0.1864	0.2119	-0.6103	0.3816
Unskilled worker	-	-	-	-
Length of education	-0.0048	0.0105	-0.0049	0.0165
Income	-0.0004	0.0003	0.0010	0.0004
Place of residence:				
Metropolitan area	0.0860	0.0733	-0.1046	0.1187
Outside the metropolitan area	-	-	-	-
Dwelling:				
House	0.3945	0.0852	0.5866	0.1583
Not house	-	-	-	-
Own/rent:				
Owner-occupier	0.9155	0.0787	1.8578	0.1867
Tenant	-	-	-	-
Log likelihood	-3,597.78		-1,888.04	
Proportion with dependent variable=1	45.6		12.8	
No. of observations	5,538		5,538	

1) The dependent variable has the value 1 if the respondent has carried out DIY activities during the last 12 months, and the value 0 otherwise.

Appendix table F2: Logistic regression of the probability of DIY in Sweden, 1997/1998. 18-74-year-olds [1)]

	Minor repairs		Major improvements	
	Coefficient	Std. deviation	Coefficient	Std. deviation
Constant	-1.5299	0.3015	-3.3195	0.5293
Sex:				
Male	0.2185	0.1027	0.1657	0.1733
Female	-	-	-	-
Age	-0.0106	0.0054	-0.0246	0.0094
Marital status				
Married	0.3851	0.1512	0.5991	0.3194
Unmarried	-	-	-	-
Children				
Children under 20	0.1553	0.1184	-0.0276	0.1945
No. children under 20	-	-	-	-
Employment				
Self-employed	-0.3973	0.2459	0.0640	0.3560
Civil servant	0.1225	0.1864	-0.2849	0.2918
Skilled worker	0.2905	0.1823	-0.2717	0.2897
Short-term unemployed[2)]	-0.5233	0.4336	-0.7494	0.7758
Long-term unemployed	0.2008	0.2868	-1.1207	0.7612
Under activation[2)]	-1.3521	1.1031	●	●
Pensioner	-0.1989	0.2277	-0.5211	0.4254
Under education	-0.1898	0.2749	-0.6509	0.5405
Other	-0.3066	0.3925	-0.2816	0.6612
Unskilled worker	-	-	-	-
Education				
Other education	-0.4635	0.4724	0.0892	0.7813
Primary and lower-secondary school	-0.0459	0.1504	0.0701	0.2719
Upper-secondary school	0.0257	0.1545	0.3974	0.2499
Short higher education	0.0667	0.1926	0.3968	0.3115
Long higher education	-0.0073	0.1782	0.3367	0.2860
Vocational training	-	-	-	-
Income	0.1064	0.0271	0.1008	0.0439
Place of residence:				
Lives in a thinly-populated area	-0.2104	0.1147	-0.0868	0.1890
Does not live in a thinly-populated area	-	-	-	-
Own/rent:				
Owner-occupier	1.0992	0.1175	1.4403	0.2426
Tenant	-	-	-	-
Log likelihood	-1,158.00		-507.76	
Proportion with dependent variable=1	40.16		8.63	
No. of observations	1,947		1,947	

1) The dependent variable has the value 1 if the respondent has carried out DIY activities during the last 12 months, and the value 0 otherwise.

2) Due to few observations for major improvement, the category: Under activation is included under Short-term unemployed.

Appendix table F3: Logistic regression of the probability of DIY in Norway, 1998. 18-74-year-olds [1)]

	Minor repairs		Major improvements	
	Coefficient	Std. deviation	Coefficient	Std. deviation
Constant	-1.2611	0.5529	-1.1101	0.8384
Sex:				
Male	0.1584	0.1559	-0.3675	0.2372
Female	-	-	-	-
Age	-0.0265	0.0069	-0.0412	0.0109
Marital status				
Married	0.5525	0.1701	0.7793	0.2934
Unmarried	-	-	-	-
Children				
Children under 6	-0.0561	0.1860	0.1382	0.2415
No. children under 6	-	-	-	-
Employment				
Self-employed	0.1700	0.3382	-0.8991	0.5536
White-collar worker	0.2224	0.2394	-0.4024	0.3227
Skilled worker	0.2631	0.3018	-0.2937	0.4111
Unemployed less than 3 months	0.5090	0.5520	-0.2083	0.8366
Pensioner	0.3698	0.3283	-0.7458	0.6014
Pupil/student	0.6671	0.3879	-0.2876	0.5776
Other	-0.1726	0.2996	-0.6427	0.4337
Unskilled worker	-	-	-	-
Length of education:				
Primary	0.2160	0.2247	-0.1461	0.3568
Short	0.1587	0.1747	0.0656	0.2526
Long	-0.4862	0.3616	0.0657	0.5220
Medium	-	-	-	-
Income:				
0-99,000	-0.2908	0.3490	-0.6310	0.5439
100,000-199,000	0.0078	0.3205	-0.0955	0.4892
200,000-299,000	0.2901	0.2994	-0.0026	0.4491
300,000-399,000	0.2603	0.3266	-0.0716	0.4921
400,000+	-	-	-	-
Place of residence:				
Agder and Rolan	0.1635	0.2186	-0.6901	0.3421
Akershus and Oslo	0.2636	0.2133	-0.1995	0.2980
Hedmark and Oppla	-0.3175	0.2651	0.1102	0.3600
Northern Norway	0.3741	0.2465	-0.3138	0.3498
Trøndelag	0.0833	0.2561	-0.4099	0.3762
Vestlandet	-0.1397	0.2079	-0.6217	0.3185
Østlandet	-	-	-	-
Dwelling:				
House	0.4478	0.1788	0.1030	0.2839
Not house	-	-	-	-
Own/rent:				
Owner-occupier	1.2833	0.1914	1.2752	0.3468
Tenant	-	-	-	-
Log likelihood	-711.85		-381.46	
Proportion with dependent variable=1	49.1		12.5	
No. of observations	1,121		1,121	

1) The dependent variable has the value 1 if the respondent has carried out DIY activities during the last 12 months, and the value 0 otherwise.

Appendix table F4: Logistic regression of the probability of DIY in the GB, 2000. 18-74-year-olds [1)]

	Minor repairs		Major improvements	
	Coefficient	Std. deviation	Coefficient	Std. deviation
Constant	1.2184	0.3684	-6.1087	1.5140
Sex:				
Male	0.2853	0.1317	1.0215	0.3209
Female	-	-	-	-
Age	-0.0267	0.0054	-0.0262	0.0135
Marital status				
Married	0.3154	0.1351	0.3603	0.3343
Unmarried	-	-	-	-
Children				
Children under 4	0.1637	0.1858	0.4017	0.3720
No. children under 4	-	-	-	-
Employment				
Self-employed	-0.0699	0.2535	0.5548	0.4905
White-collar worker	-0.3873	0.1874	-0.1950	0.4167
Skilled worker	-0.1553	0.2297	-0.3341	0.4896
Unemployed	-0.3179	0.4564	-0.3787	1.4733
Other	-0.4970	0.2046	-0.4127	0.5198
Unskilled worker	-	-	-	-
Education				
A level or higher/ Onc/BTEC	0.1337	0.2026	0.0770	0.4769
Degree or higher degree[2)]	0.2181	0.1803	-0.1290	0.4517
O level or GSCE equivalent[3)]	0.1633	0.1606	0.4825	0.3689
Other qualification/no formal qualifications	-	-	-	-
Income	0.0035	0.0092	-0.0263	0.0204
Place of residence:				
London and Southeast England	-0.0027	0.1596	0.1700	0.3978
Midlands and East Anglia	-0.0344	0.1447	0.3066	0.3455
Southwest England and Wales	0.4963	0.1795	0.8569	0.3901
Northern England and Scotland	-	-	-	-
Own/rent:				
Owner-occupier	0.9555	0.1644	3.6617	1.3906
Tenant	-	-	-	-
Log likelihood	-885.81		-230.5742	
Proportion with dependent variable=1	35.81		4.39	
No. of observations	1,458		1,458	

1) The dependent variable has the value 1 if the respondent has carried out DIY activities during the last 12 months, and the value 0 otherwise.
2) Including ”Higher educational qualifications below degree”
3) Including GCSE grade or CSE grade 2-5 or standard grade level 4-6.

Appendix table F5: Logistic regression of the probability of DIY in Germany, 2001. 18-74-year-olds [1)]

	Minor repairs		Major improvements	
	Coefficient	Std. deviation	Coefficient	Std. deviation
Constant	-0.7599	0.1720	-3.5685	0.4695
Sex:				
Male	0.5357	0.0783	0.1882	0.1875
Female	-	-	-	-
Age	-0.0117	0.0037	-0.0307	0.0101
Marital status				
Married	0.7845	0.0856	0.7972	0.2470
Unmarried	-	-	-	-
Children				
Children under 6	-0.2565	0.1047	0.4723	0.2208
No children under 6	-	-	-	-
Employment				
Self-employed	0.3041	0.1574	0.8248	0.4073
White-collar worker	0.0644	0.1160	0.6131	0.3343
Skilled worker	0.2079	0.1213	0.8435	0.3416
Short-term unemployed	-0.7931	0.4521	1.5580	0.7003
Long-term unemployed	-0.0128	0.1814	0.7973	0.4567
Pensioner	-0.1069	0.1481	0.7743	0.4267
Under education	-0.7525	0.2478	-0.4108	0.5579
Other	-0.1284	0.1300	0.2700	0.3636
Unskilled worker	-	-	-	-
Education				
Keinen beruflichen Abschluss	-0.3085	0.1200	0.1118	0.3163
Fachschule, Meister-, Teknikschule	0.3669	0.1133	0.3831	0.2541
Fachhochschulabschluss	0.0109	0.1468	0.4573	0.3094
Hochschulabschluss	0.2442	0.1275	0.0423	0.3141
Andreren beruflichen Abschluss	0.4022	0.2420	-0.4578	0.7115
Student(in)	0.4058	0.2709	2.1522	0.5347
Berufliche/betriebliche Ausbildung[2)]	-	-	-	-
Income	-0.0073	0.0030	-0.0135	0.0071
Place of residence:				
West Germany	-0.2693	0.0826	-0.6325	0.1830
East Germany	-	-	-	-
Own/rent:				
Owner-occupier	0.2133	0.0691	1.5678	0.1853
Tenant	-	-	-	-
Log likelihood	-2,853.72		-700.47	
Proportion with dependent variable=1	31.90		3.82	
No. of observations	4,883		4,883	

1) The dependent variable has the value 1 if the respondent has carried out DIY activities during the last 12 months, and the value 0 otherwise.

2) Also includes apprentices.

Appendix table F6: Logistic regression of the probability of DIY in all the countries. 18-74-year-olds. Single persons only [1)]

	Denmark		Norway		Sweden		Germany		Great Britain	
	Minor	Major	Minor	Major	Minor	Major[2)]	Minor	Major	Minor	Major
Sex	Unim.	*	***	Unim.	Unim.		***	Unim.	Unim.	***
Age	**	***	Unim.	*	**		**	Unim.	**	*
Children under 6 [3)]	**	Unim.	Unim.	Unim.	Unim.		Unim.	Unim.	*	Unim.
Occupation	*	Unim.	Unim.	Unim.	*		**	Unim.	*	Unim.
Education	Unim.	Unim.	Unim.	Unim.	Unim.		***	***	Unim.	Unim.
Income [4)]	Unim.	**	Unim.	Unim.	Unim.		*	Unim.	Unim.	Unim.
Region	*	Unim.	Unim.	Unim.	Unim.		Unim.	***	***	Unim.
Lives in a one family house	***	Unim.	*	Unim.						
Own/rent	***	***	***	***	***		Unim.	***	***	***
Proportion who have carried out DIY	34.0	8.2	39.5	7.5	22.6	3.0	23.7	2.6	31.7	3.3
No. of observations	1,549		319		527		2,100		690	

1) The dependent variable has the value 1 if the respondent has carried out minor or major DIY during the last 12 months, and the value 0 otherwise.

2) Only 16 single persons have carried out major DIY, which means that the results are highly uncertain.

3) Children under 20 in Sweden and children under 4 in Great Britain.

4) The German survey also includes the interviewer's estimation of the respondent's income if the respondent has not stated personal income. This reduces non-response to the income question to just 0.7 %.

*** Indicates that the coefficient is significant at the 1% level, ** that the coefficient is significant at the 5% level, and * that the coefficient is significant at the 10% level.

Unim.: Indicates that the variable is unimportant.

Appendix table F7: Logistic regression of the proportion of DIY in all the countries. 18-74-year-olds, with income as the broken down variable [1) 2)]

	Denmark		Norway		Sweden		Germany		Great Britain	
	Minor	Major	Minor	Major	Minor	Major	Minor	Major	Minor	Major
Sex	Unim.	Unim.	Unim.	Unim.	**	Unim.	***	Unim.	**	***
Age	***	***	***	***	**	***	***	***	***	*
Marital status	***	***	***	***	**	Unim.	***	***	**	Unim.
Children under 6 [3)]	Unim.	Unim.	Unim.	Unim.	Unim.	Unim.	**	*	Unim.	Unim.
Occupation	*	Unim.	Unim.	Unim.	**	Unim.	***	Unim.	Unim.	Unim.
Education	Unim.	Unim.	Unim.	Unim.	Unim.	Unim.	***	***	Unim.	Unim.
Income [4)]	***	**	*	Unim.	***	***	*	Unim.	Unim.	*
Region	Unim.	Unim.	Unim.	Unim.	*	Unim.	***	***	**	Unim.
Lives in a one family house	***	***	**	Unim.						
Own/rent	***	***	***	***	***	***	***	***	***	***
Proportion who have carried out DIY	45.6	12.8	49.1	12.5	40.2	8.6	32.9	3.9	35.3	4.3
No. of observations	5,538		1,121		1,947		4,883		1,458	

1) The dependent variable has the value 1 if the respondent has carried out minor or major DIY during the last 12 months, and the value 0 otherwise.

2) Income is now broken down for all countries instead of following a continuous distribution.

3) Children under 20 in Sweden and children under 4 in Great Britain.

4) The German survey also includes the interviewer's estimation of the respondent's income if the respondent has not stated personal income. This reduces non-response to the income question to just 0.7 %.

*** Indicates that the coefficient is significant at the 1% level, ** that the coefficient is significant at the 5% level, and * that the coefficient is significant at the 10% level.

Unim.: Indicates that the variable is unimportant.

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