

**The Shadow Economy  
in Western Europe**  
**Measurement and Results  
for Selected Countries**

**Søren Pedersen**

**with contributions from Esben Dalgaard and  
Gunnar Viby Mogensen**

**The Shadow Economy in Western Europe  
Measurement and Results for Selected Countries**

**Study no. 5**

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## Preface

It is usually assumed that the “black economy”, or shadow economy, is relatively modest in the Scandinavian countries and becomes a larger and more important element in a country’s economy the further south you go in Europe.

Precisely *how* quickly the importance of the shadow economy grows depends to a large extent on how it is defined. When it is based – as so often in the international press – on a monetary definition, i.e. on a “money surplus”, the reader is often left with the impression that many countries have an extremely large shadow economy.

The Research Unit has previously attempted to identify the methodological weaknesses in monetary and other measurements – including the Unit’s own – namely in *The Shadow Economy in Denmark 1994. Measurement and Results (1995)*, by Gunnar Viby Mogensen et al. The present study, which is an unedited translation of the author’s book in Danish *Skyggeøkonomien i Vesteuropa. Målinger og resultater for udvalgte lande (1997)*, is an attempt to extend this to current European research in the shadow economy.

At present, this research is only of a fairly reliable quality in a few European countries. Despite the difficulties, however, this study attempts to compare – method by method – the results of seven countries.

While the analyses must generally be based on data from *existing* research, the Danish figures have been updated to 1997.

The analysis has been carried out by Søren Pedersen, MA (Econ), who has carried out similar work for the Research Unit for many years, most recently in the above-mentioned methodological study from 1995 and in a contribution (on the interaction between the black and white labour markets) to the study *Work Incentives in the Danish Welfare State. New Empirical Evidence* (by Søren Brodersen, Lisbeth Pedersen, Peder J. Pedersen, Søren Pedersen and Nina Smith).

Søren Pedersen has been able to draw on the experience of Chief Economist (GNP) Esben Dalgaard, an expert from Statistics Denmark on precisely the grey area between the national accounts and the shadow economy. Esben Dalgaard has also written chapter 4 in this book.

The collaboration with Esben Dalgaard, the interview department, graphics department and library at Statistics Denmark has, as usual, been invaluable. We are extremely grateful to Statistics Denmark and Jan Plovsing, Director of the Statistics Denmark, for this help.

#### 4 *Preface*

Claus Larsen, MA (Econ), has provided valuable help in many phases of the research up to and including publication of the book, which has been the overall responsibility of Bent Jensen and Hanne Lykke, both of the Research Unit.

Copenhagen, August 1998

Gunnar Viby Mogensen

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# 1. Definition of the concepts “shadow economy” and “black activities”

## 1.1 Introduction

The size of the black economy in Denmark has been amply documented through extensive questionnaire surveys. While only a small part of Danes' economic activity is undeclared, and therefore sold considerably below the price of the same activities in the “formal” market, it has increased throughout the 1980s and early 1990s, though falling again slightly in the following years.

One of the questions which cropped up during the planning phase of the collection of Danish figures for recent years (1995-97) was how they compared with figures for other European countries. Does the incidence of black activities increase from north to south in Europe, as often presumed – and if so, how much? And are there differences in the incidence of black activities between the relatively homogeneous welfare states of northern Europe, so that, in countries (like Denmark) with high direct taxation of earned income, relatively more people choose to work without paying tax?

The difficulty of measuring black activities in a given country is partly due to the fact that the purpose of these activities is precisely to avoid being registered, because registration is used for purposes of taxation, and partly because research in the area is still relatively new. It is only about 15 years ago that the first major Dutch, Norwegian and Danish questionnaire surveys on the black economy were carried out. Measurement *between* countries is made more difficult by the fact that the distinction between taxable and tax-exempt activity varies from country to country.

The upshot is that only a few countries in Europe – and these mainly in N.W. Europe – have reliable measurements of the extent of the black sector, and where they exist, these measurements often only cover one or a few years. In turn, the lack of reliable measurements also means that researchers in the field have yet to agree on an internationally recognised definition of black activities.

In view of the current level of knowledge, therefore, any comparison of the variation in size of the black sector in Europe can only involve a few selected countries. Furthermore, cross-border comparisons will only be relevant and/or useful where the different concepts are defined in more or less the same way.

The review of West European research on the extent and structure of black activities presented here thus involves six countries in all, namely – in addition to

Denmark – Norway, Sweden, Germany, Holland and Spain. The study also presents the results of research on black activities in Denmark for 1995, 1996 and 1997.

Before turning to this comparison, however, the next section clarifies precisely what is meant by black activity and the shadow economy in Danish research in the field.

Chapter 2 presents a short review of foreign researchers' attempts to make international comparisons of black activity or the shadow economy, while chapter 3 discusses the various methods that have been developed to measure black activities and the measures used to describe its extent.

Chapter 4 describes the attempts of EU statisticians to incorporate the black economy into national accounts figures in order to obtain a better comparison of EU members' actual economic capabilities. This is not just an academic exercise, since member contributions to EU coffers are partly, and increasingly, determined on the basis of their gross national product (GNP). If, for example, an EU country has a large black economy which is not measured, then this country's payments to the EU will be far below the level its actual economic capability suggests. Chapter 4 is written by Statistics Denmark's expert in this area, Chief Economist (GNP) Esben Dalgaard.

The results of the (by now) well-tested Danish questionnaire surveys are presented in chapter 5, with a focus on the new Danish figures for 1995, 1996 and 1997.

Finally, chapter 6 provides a detailed review of studies of black activities carried out in Holland, Germany, Norway, Sweden and Spain. The emphasis here is on representative questionnaire surveys.

## **1.2 Definition of "shadow economy", "black economy" and "black activities" in the Danish questionnaire surveys**

By and large, there are almost as many definitions of shadow economy as there are researchers dealing with the subject. The English-language literature abounds with them, e.g. "shadow economy", "hidden economy", "parallel economy", "black economy", "subterranean economy" and "underground economy". The list is almost endless.

Thomas (1992) has found 15 different terms for the phenomenon in I.L.O.'s "Bibliography of Clandestine Employment" (I.L.O., 1987). He has also discovered that, in the British English literature, "black economy" was the most-used term, followed by "hidden economy". North Americans do not use the term

“black economy”, however, preferring “underground economy” instead, followed by “hidden economy”. Thomas’ (1992, p. 125) list is reproduced in appendix 2, together with a few additional terms that can be useful in literature searches on the subject.

Not only different terms are used for the same phenomenon, however. Different authors, even in the same country, can use the same term or concept to describe completely different things.

The various definitions are due to the fact, mentioned above, that there is still no internationally accepted definition for the phenomenon. According to Pesut (1992), this is because very different social and economic conditions are being described, depending on the approach used and the country concerned.

In his review of the literature, however, Pesut (1992) finds an increasing consensus that an appropriate definition of shadow economy should meet two criteria. Firstly, that the shadow economy is not covered by the usual measures for a society’s economic activities, and secondly, that the shadow economy can best be measured in relation to the internationally recognised limitations and definitions used in the national accounts.

The advantage of following the latter is that it allows a more useful comparison of the extent of the shadow economy between countries. For example, it would ensure that, among other things, do-it-yourself (DIY) activities and voluntary work (e.g. in the Boy Scouts or relief organisations) were not included under the shadow economy. According to Pesut, this would probably give the most easily acceptable definition of the shadow economy as “that part of the domestic product which is not measured by official statistics” (Pesut, 1992, p. 3).

Efforts to harmonise the different measurements used in various European countries has also made it necessary to clarify the definitions used in Danish measurements of non-declared economic activities. These have, up to now (most recently in Viby Mogensen et al. (1995) and Pedersen (1995)), been described as “the shadow economy”, of which those activities carried out at less than full price were termed “black activities”.

However, in recent years, statisticians (in EUROSTAT and elsewhere) have switched to using the term “black economy” for that part of total non-declared activities which reflects a productive effort – and thus part of value added, or GDP, in the national accounts. Here, the terminology used in Danish research follows this norm.

The term “shadow economy” is therefore expanded to include, on the one hand, the total sum of “the black economy” (under-declaration at both full price and less than full price) – which lies within the so-called “production boundary” of the GDP – and, on the other hand, all other (“non-productive”) under-declaration (of, for example, transfer income, interest and tax deductions). In theory, the shadow economy also includes illegal production (e.g. drug-dealing and prostitution, etc.), but in practice such activities have not been incorporated up to now (see also chapter 4).

The terminology and definitions used in the rest of the book are shown in figure 1.1 below.

Figure 1.1: Definition of the “shadow economy”, “black economy” and “black activities” in relation to the formal and informal economy in the Danish questionnaire surveys, 1980-97

Formal (declared economy)	Households: Agricultural goods and own production of investment goods			Included in GDP	TOTAL (theoretical) GDP	“Production boundary” ↙
	Public goods					
	Declared part of the market economy					
Informal (non- declared economy)	Shadow econ- omy	Non-de- clared part of the mar- ket econ- omy = The black economy	Normal under- declaration (full price)	Partly in- cluded in GDP	TOTAL (theoretical) GDP	“Production boundary” ↙
			Black activi- ties (less than full price)			
		Illegal economic activity (e.g. prostitution and drug- dealing)		In practice, not included in GDP		
		Tax evasion, e.g. transfer income, interests received and deductions, etc. <sup>1)</sup>		Not included in GDP		
	Households: Services					

Note: The relative size of the various boxes in the figure should not be attributed any significance. The categorisation of “household goods” in the productive sector follows national accounting principles in the SNA for 1993, which are more consistent than in the older version (SNA, 1968).

<sup>1)</sup> Involves the redistribution of income derived from GDP.

Basically, the national accounts distinguish between productive economic activities, which are thus included in GDP, and non-productive economic activi-

ties, which are not. This distinction has been laid down in international agreements at the UN on the drawing up of national accounts – the so-called System of National Accounts, SNA. Similar guidelines in the EU go under the term ESA. While economists and national accounts statisticians still argue about the exact definition of a productive economic activity, the definition currently used in ESA has been thoroughly debated and accepted.

Here, *the formal, or declared, economy* is defined as productive activities which in themselves are legal, and which are fully declared to the authorities for purposes of paying taxes, VAT, etc. In accordance with national accounting definitions, the formal economy also includes the public sector.

In the national accounts, it is not important whether a productive activity is legal or not.

In principle, certain kinds of illegal activities, e.g. drug-dealing, illicit distilling, prostitution, etc., should be included in the national accounts, inasmuch as they involve the production of goods/services which are sold in a market through voluntary transactions between buyer and seller (see chapter 4, Blades (1982), and Tengblad (1994)). Illegal transactions such as theft, robbery, etc., should not be included in the national accounts, on the other hand, since the transaction is not always voluntary – more a case of “redistribution”. In practice, however, illegal activities which should be included in the national accounts are left out due to the difficulty of obtaining valid data.

DIY activities are deliberately excluded from the national accounts, unless they result in investments in buildings and machines or the production of agricultural products. The same applies to production in households, such as cooking, cleaning, childcare, etc., which is carried out by members of the household themselves.

In figure 1.1, *the informal or non-declared economy* consists partly of productive economic activities which in themselves are legal, but on which tax, VAT, etc., is not paid. This is the part which is also called the black economy, and which meets the criteria in the national accounts definitions. Apart from this, the informal economy also consists of those illegal transactions which, in principle, are productive economic activities in a national accounting sense, but which in practice are not included in GDP due to lack of information.

Similarly, tax evasion regarding transfer income, interests received and tax deductions, though included in the definition of the informal economy, lie outside the national accounts’ “production boundary” (see figure 1.1). The informal

economy also includes DIY activities and production in households (except agriculture), which are not included in the national accounts either.

While DIY activities, household production and illegal activities are deliberately left out of the national accounts, it is a different matter with economic activities in the black economy. As mentioned above, the economic activities in *the black economy* in figure 1.1 meet all the criteria for inclusion in the formal economy, inasmuch as they involve the production of goods/services that are either sold or bartered. They are not included in the formal economy, however, because the purpose of these activities is precisely to avoid taxation and with it registration.

Some of the activities in the black economy are included in the national accounts, however, due to the way they are estimated. For example, the value of car repairs is included in the national accounts by multiplying the number of cars in various categories by an average price for the repair of cars in these categories obtained from FDM (Forenede Danske Motorejere – corresponds to the English Automobile Association), cf. Stetkær (1983) and Viby Mogensen (1985). In other words, as far as the national accounts are concerned, whether car repairs are carried out at full price, and thus taxed, or whether they are clandestine activities is irrelevant.

Similarly, the production value of building starts is included in the national accounts by taking the value of building materials used, together with wage costs, whether these activities are carried out by professional builders (and thus invoiced), people who build their own homes, or others outside the construction industry (not invoiced), cf. Statistics Denmark (1991a). Thus, the value of building starts is included in the national accounts irrespective of whether the activity is declared to the Inland Revenue, or whether it is carried out as a DIY activity. As regards housing repairs and maintenance not carried out by professional builders, only the value of the materials used is included in the national accounts, so that only part of these non-registered activities are included, cf. Statistics Denmark (1991a).

The production value in agriculture is also included in the national accounts, without distinguishing whether these activities are declared to the tax authorities or not, by means of a price-times-volume calculation, cf. Statistics Denmark (1991a). The production value is thus calculated as the product of the volumes sold and the average prices obtained. These prices and volumes come from a number of different sources, including sample surveys of various farms and market gardens. Such calculations thus ignore the fact that farm income may or may not be declared to the tax authorities.

The national accounts are thus able to include non-declared activities in agriculture, building starts and car repairs. They are also able to include parts of the black economy by means of the materials normally bought in the formal market, and which are included as raw materials for work or services that are not declared. Thus, subsequent references to the extent of the black economy or black activities do not mean that the national accounts have been underestimated by the same amount. Such figures for the extent of the black economy in relation to, for example, GDP, are only mentioned to give an idea of the size.

The Danish definition of *shadow economy* also includes, in addition to the black economy, fraud involving transfer income, non-declared interests received, and false tax deductions, e.g. over-declaring the mileage between home and work. This form of tax evasion is not included in GDP, however, since it does not involve production. But these activities are also relevant as regards the extent of total tax evasion, of course.

In principle, the definition of the shadow economy also includes – in line with the national accounts – illegal productive economic activities (e.g. prostitution and drug-dealing). In practice, however, these activities have not been measured in Danish questionnaire surveys, and there are no figures for these or similar activities in the national accounts statistics.

In practice, therefore, the shadow economy includes normal under-declaration at full price, black activities and fraud with tax deductions and interests received. With regard to normal under-declaration and fraud with tax deductions and interests received, only the one party (the doer) knows that the activity in question is not declared to the authorities.<sup>1</sup> Black activities at less than full price cover those cases where both buyer and seller of the activity concerned are aware of, or suspect, that the activity is not declared to the tax authorities. Here, both buyer and seller share, so to speak, the tax and VAT thus saved. It should also be noted that the term “black activities at less than full price” also covers black transactions, e.g. farmers who sell pigs or eggs on the side. In the following the term “black activities” will be used rather than “black activities at less than full price”.

As figure 1.1 also shows, the definition of the shadow economy does not include tax avoidance as such. Tax avoidance exploits loopholes in the law, right up to the dividing line between legal and illegal. But it does not cross this line, and the tax and/or VAT thereby saved does not contravene the law, though it does perhaps contravene the spirit of the law.

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<sup>1</sup> In the following, the term *tax evasion* covers both “normal under-declaration” and “tax evasion involving interests received and deductions” in figure 1.1.

The division of the shadow economy into tax evasion and black activities is based on a labour market interest in the black sector. If interest is centred on the effect of non-declared activities or the total supply of labour, then hidden activities that do not affect the supply of labour will obviously cease to be of interest. This can, for example, be tax evasion in the form of declaring an allowance you are not entitled to, or a higher allowance than you are entitled to. It can also be not declaring the income from an extra job to the tax authorities. These forms of tax evasion will not normally influence the supply of labour.

As pointed out by Viby Mogensen (1985), however, it cannot be ruled out that the supply of labour, especially for the self-employed in certain industries, increases in the long term because the possibilities for evading tax in these industries are particularly favourable. On the other hand, this effect can be neutralised if all potential buyers of a firm in the industries concerned perceive the possibilities of evading tax as equally big. Future black incomes will thereby be capitalised, and, other things being equal, the price of these firms will thus be higher – without any effect on the supply of labour.

Black activity is thus characterised by the fact that both the buyer and seller of the activity obtain an economic advantage in the form of saved tax and VAT. This results in a particular demand for black activities, because the buyer also derives an advantage from the activity not being declared to the tax authorities. Payment in the black market is higher after tax than if the activity had been declared to the tax authorities, and it is this higher after-tax income that creates the supply of labour in the black market.

From a labour market point of view, therefore, there are good reasons for distinguishing between tax evasion and black activity, as is the practice in Danish research. This does not always seem to apply in the public debate, however, where ordinary tax evasion, e.g. not declaring the income from renting a weekend cottage at formal market price, is often called black. As previously mentioned, and also discussed below (in chapter 6, for example), most attempts in other countries to measure non-declared activities do not distinguish between black activities and ordinary tax evasion either.

Many of the methods that have been developed to measure the shadow economy are unable to bring out this difference between black activities and tax evasion. Most of these methods measure the whole shadow economy. Questionnaire surveys can get around this problem, however, by specifying to respondents precisely what is meant by black activities – i.e. both the buyer and seller of an activity must derive an advantage from not declaring something to the tax authorities. The Danish studies have employed precisely such questionnaire surveys.

The boundary between black activities and households is not at all easy to define. The Danish questionnaire surveys also include as black activities the sale of goods/services where payment is in the form of a quid pro quo, either now or later, in everyday language also called a friendly turn. This is due to the fact that Danish tax legislation (Statsskatteloven §§ 4-6) does not distinguish between income in the form of money and other assets of economic value.

The tax assessment manual (Ligningsvejledningen) for 1996 mentions an example in which payment for a piece of work is in the form of a quid pro quo that is subject to tax: “A bricklayer did some work for his brother-in-law, a motor mechanic. In return, the brother-in-law did some work on the bricklayer’s car. The mechanic was taxed on the value of the bricklaying, while the bricklayer was taxed on the value of the car repairs. In these situations, the work must be taxed *irrespective* (author’s emphasis) of whether it is within the line of work of the person concerned, and *irrespective* (author’s emphasis) of whether an asset has been created, inasmuch as a payment has been made for work carried out” (pp. 94-95).

A ruling in Landsskatteretten (Danish National Tax Tribunal) supports this: “Where people who build their own homes – also including non-craftsmen – form a group who *jointly build a number of houses* for their own use, then according to Landsskatteretten’s practice, each of them is liable to tax on the value of the work the others have done for him, this being considered as payment for the assistance he has himself rendered them (LSR 1965-102)”, cf. Hans-Egon Kolding in *Skatten 1998* (p. 179): People who build their own homes are also mentioned in the tax assessment manual for 1996, p. 94, which discusses cases where taxpayers receive payment for work in various forms, e.g. payment in kind, by others doing work for the taxpayer without charge, or by a reduction in the taxpayer’s non-deductible expenses (cf. Landsskatteretten 1952.128, 1965.102).

Tax legislation is thus quite clear on this. On the other hand, there must obviously be a limit below which friendly turns are not liable to tax – in practice, for example, the Danish tax authorities turn a blind eye to non-declared income under DKK 1,000 per year, cf. Viby Mogensen et al. (1995). Friendly turns at this level are a normal part of people’s social life, of course, and are often not considered liable to tax (see, for example, Benedicte Madsen and Mette Nayberg (1992)).

In the Danish questionnaire surveys, the instructions to interviewers include an example of what is regarded as black activity and what is not. The instruction regarding the dividing line between black activities and friendly turns is as follows:

*“The concept is regarded more broadly here. It does not have to involve money. Work or services which are only (now or later) expected to be “paid” in kind, and which some people often just regard as good neighbourliness, friendly turns, etc., are also considered “black activities” in this survey. Such activities give people an economic benefit which should be taxed. Only services within the nuclear family and completely trivial services outside the family fall outside our concept – e.g. walking a sick neighbour’s dog. However, it is regarded as a “black” activity if, for example, a farmer permanently stables a horse for a neighbour, who, in return, drives the farmer’s children to and from school every day.”*

The definition of a household can also make the distinction between black activities and the household sector more difficult, cf. Viby Mogensen (1985). Work done on the house by a son still living at home will therefore be counted as part of the household sector (DIY activities), and thus not black activity. But how distant does the family connection have to be before it is counted as black activity? The Danish questionnaire surveys follow the practice of the Danish Inland Revenue, i.e. activities carried out by family members outside the nuclear family are counted as black activity (see also the instructions to interviewers above).

It should be emphasised that leaving the question of definition partly up to the interviewer’s discretion is not without its problems, of course. While the aforementioned instructions – written, and, in the latest surveys, also oral – prior to the interviews try to eliminate as much variation in these judgements as possible, it cannot be eliminated completely.

To this must be added another problem during the interview itself. Despite the fact that the Rockwool Foundation Research Unit has always used highly qualified interviewers from both the Danish National Institute of Social Research and Statistics Denmark, it cannot be ruled out that, in the actual interview situation, the interviewer may feel somewhat uncomfortable asking questions about black activities, which, after all, is illegal.

With this in mind, Viby Mogensen et al. (1995) tried to find out whether it was possible to demonstrate a so-called interviewer effect on the questions about black activities. However, this also involved looking at other questions which could be assumed to be sensitive, e.g. questions about gross earnings, whether the respondent had smoked marijuana, and whether they had taken sleeping pills.

The results of these investigations showed that an interviewer effect on questions about black activities could be demonstrated. But an interviewer effect was

also demonstrated on other sensitive questions of the kind mentioned above. The biggest effect was found for questions about black activities, though it was not much higher than for the other questions. Furthermore, there also proved to be an interviewer effect on the question of whether the respondent had a higher preparatory examination or “A” levels – a question that was expected to be less sensitive.

It has not been possible to determine whether this interviewer effect pulls the frequency of black activities in one direction or the other. However, the mere presence of such an effect means that the results are subject to greater uncertainty.

However, this uncertainty is probably far less than the effect produced by changes in the questions themselves, cf. Viby Mogensen et al. (1995) and chapter 5 in this book.

### 1.3 Design of the questions

In addition to the omnibus surveys carried out by the Danish National Institute of Social Research and Statistics Denmark, the questions about black activities have also been used in a major survey in 1993/94 about incentives in the labour market. All the surveys have asked whether respondents have carried out black activities themselves. The questions begin with the following text, which is read aloud to the respondent:

*“The next questions are about what is popularly called “black activities”.*

*There is considerable evidence to show that a large part of the population accepts “black activities” and “illegal trade” – i.e. activities which circumvent the Inland Revenue, where all parties benefit because they do not pay tax or VAT, etc.*

*This can involve “black activities” which you pay for in cash, but can also include reciprocal favours between friends, acquaintances and family members.”*

This is followed by the question itself:

*“Have you carried out activities of this kind during the past year?”*

The interviewers are thus careful to ask about activities where both buyer and seller of the activity are clear about, or assume, that nothing is declared to the tax authorities. As can be seen, we are now in the “box” in figure 1.1 called

“black activities (less than full price)”. From the above question, it can also be seen that the interviewer asks about the foregoing year.

These questions have been followed by others over the years, e.g. about the kind of black activity, how long they have been carried out, etc.

The results of the most recent Danish questionnaire surveys of black activities are discussed in more detail in chapter 5. The next chapter looks at the attempts of other researchers to compare the extent of black activity in Europe.

## **2. Previous comparisons of the shadow economy in European countries**

### **2.1 Introduction**

The attempt in this book to base the comparison between European countries solely on research which has used the same, or almost the same, definitions and data collection methods has unfortunately been unable to build on similar research abroad. However, based on somewhat less rigorous demands of comparability, we have been able to draw on the work of foreign researchers on the shadow economy in different European countries.

Most of these foreign studies have been written by economists, though there are also many contributions from the other social sciences, particularly sociology and anthropology. The two latter typically consist of case studies within a particular industry or region, which provide a highly detailed picture of the shadow economy in the industry or region concerned. Examples include Benton (1990), Renooy (1990), and Smith (1990). Thomas (1992, p.189-94) contains a brief outline of other social science contributions to research on the shadow economy. It is not possible to say anything about the overall extent of the shadow economy on the basis of such studies, of course, which is precisely the purpose of this book.

The main contributions to comparisons of the shadow economy across countries can be found in Tanzi (1982), Gaertner & Wenig (1985), Feige (1989), Pyle (1989), Barthelemy et al. (1990), Cowell (1990), Thomas (1992) and United Nations (1992).

Basically, these contributions can be divided into two groups. The one group consists of – mainly broad – attempts at actual comparison, the books being written by a single author who has reviewed a large part of the literature on the shadow economy in different countries. This group includes, for example, Pyle (1989) and Thomas (1992). Cowell (1990) also belongs to this group, though he has focused less on the empirical and more on the theoretical contributions.

In the other group, the books typically consist of contributions from different authors from different countries, e.g. Tanzi (1982) and Feige (1989). Gaertner & Wenig (1985), a collection of analyses from 1983 presented at a conference on the shadow economy in Bielefeld, Germany, also belongs to this group. Barthelemy et al. (1990) have produced an overview of the shadow economy in individual countries for the EU, while the UN's "Guidebook to Statistics on the

Hidden Economy” (United Nations, 1992) is a collection of important articles previously published in books and journals.

## **2.2 Attempts at international comparisons of the shadow economy**

Pyle (1989) and Thomas (1992) in particular have carried out studies of the shadow economy in different countries. As mentioned above, Cowell (1990) has also looked at the spread of the shadow economy across countries, but his main focus has been on a review of the theoretical part of the literature.

All three authors first discuss the various methods developed to measure the extent of the shadow economy. They then present the results for the different methods and countries concerned.

The main aim of the three authors has been to review and present the literature on the shadow economy. Thus, they have not (see above) focused much on an actual comparison of the shadow economy in specific countries. The countries selected by the authors have primarily been included because the existing analytical methods happen to have been used in these countries.

Pyle (1989) also divides the review of the empirical studies into two parts, one (two chapters) dealing with the different monetary methods used and the other with other methods for measuring the shadow economy. Chapter 3 in this book describes these methods in more detail.

As regards the monetary methods – which, together with the other methods, are described in more detail in chapter 3 below – Pyle (1989) has reviewed 15 studies in 10 OECD countries. He then summarises the results of these studies in a table, which is reproduced here in table 2.1. The measure used for the size of the shadow economy is the proportion of GDP or GNP.

As can be seen from the table, Pyle has included the whole of the OECD, not just Europe, in his review. The table also shows that there are big variations in the size of the shadow economy, even within the same country, measured by monetary methods.

In the second part of his review of empirical results (chapter 4), however, Pyle is more cautious about comparing the results of the shadow economy for individual countries. There is thus no comparable table for these methods. This can partly be due to the fact that these methods have not been so widely used as the monetary methods, and partly because non-monetary methods are so different that it can be difficult to compare their results.

Table 2.1 Pyle's (1989) summary of 15 monetary studies of 10 OECD countries (% of GDP/GNP)

Country	Author	1970	1975	1976	1978	1979	1980	1982
USA	Gutmann (77)			10				
	Feige (79)			13-22	25-33			
	Tanzi (80)			8.1-11.7				
	Tanzi (83)	2.2-4.6	3.8-5	3.6-5.5			4.5-6.1	
Canada	Porter and Bayer (84)	4.6-10.2	5-30.2				6.1-41.6	
	Mirus and Smith (81)			5-28				
Australia	Tucker (82)					10.6 (1978-9)		
	Norman (82)							13.4 (1981-2)
UK	O'Higgins (81)				2.9-5.4			
Sweden	Matthews (82)					5.8-7.1		
	Klovland (84)							3-19.7
Norway	Schneider and Lundager (86)	6.8-7.8	10.2-11.3				11.2-12.4	11.6-13.1
	Schneider and Lundager (86)	6.2-6.9	7.8-8.2				9.9-10.4	9-9.6
Denmark	Schneider and Lundager (86)	5.9	6.4-6.6				6.8-7.2	6.8-7.1
Western Germany	Kirchgässner (83)	2.7-3.1	5.5-6				10.3-11.2	
Ireland	Boyle (84)	1	1				8	11 <sup>1)</sup>
Italy	Martino (81)						30?	

Note: <sup>1)</sup> Concerns 1983

Source: Pyle (1989, p. 53).

If an attempt is made anyway to summarise the results of the non-monetary methods reviewed by Pyle, the picture in table 2.2 emerges. The methods themselves are also briefly described in the table – see also chapter 3 for a more detailed description. The table clearly shows that Pyle has especially been interested in determining the size of the shadow economy in the UK.

As mentioned above, methods for determining the size of the shadow economy are very different, so comparisons are difficult. Notwithstanding, table 2.2 shows that, with the exception of the Italian results, there is not a lot of difference between the levels for the countries concerned.

In one chapter, Thomas (1992) tries to estimate the shadow economy based on a macroeconomic approach, using measurements based both on national accounts figures – discussed in more detail in chapter 3 below – and various monetary methods. Thomas summarises these results in a table, reproduced here in table 2.3.

Table 2.2 Summary of the results of non-monetary methods reviewed in Pyle (1989)

Country	Author	Size of the shadow economy	Year	Method
UK	Dilnot & Morris (1982)	2.3-3% of GNP	1977	Differences between income and expenditure at household level (Family Expenditure Survey)
UK	O'Higgins (1980)	2% of GNP	1977	do.
UK	Pissarides, Smith & Weber (1986)	Concealed income by self-employed amounts to 10-20% of recorded income		do.
UK	Macafee (1982)	3-3.5% of GDP	1978	Differences between income and expenditure at national level (National Accounts Statistics)
Sweden	Blades (1982)	3.6% of GDP	1979	do.
W. Germany	Petersen (1982)	4.8% of GNP	1974	do.
Italy	Contini (1982)	14-20% of GNP	1977	Labour Market Studies (differences between officially measured labour-force participation rate and actually observed participation rate in questionnaire)
Norway	Isachsen, Klovland & Strøm (1982)	2.3% of GDP	1980	Questionnaire
Norway	Isachsen & Strøm (1985)	2% of GDP	1983	Questionnaire
Belgium	Pestieau (1985)	Time use in the black economy amounts to 14% of work time in the formal economy	1983	Questionnaire (only in Liège)

Source: Pyle (1989, pp. 58-78).

In another chapter, Thomas discusses various other attempts to measure the shadow economy. These include the Inland Revenue's audits of tax returns, questionnaire surveys of the labour market (including more or less direct questions about participation in the black market), and comparisons of income and expenditure in household budget surveys. Thomas is not concerned with finding measures for the size of the shadow economy in this chapter, however – even though he mentions Dilnot & Morris (1982), Macafee (1982) and O'Higgins (1980), cf. above – which is why there has been no attempt to summarise the figures he refers to in a table.

Pyle and Thomas' approaches are thus not so very different from each other. They both start with a fairly detailed discussion of the various methods used, which is also valuable because they are highly critical. And both authors have more or less reviewed the same literature, which is why there is not much dif-

ference between table 2.1 and 2.3. The two tables also show that the figures for the extent of the shadow economy are relatively old.

Table 2.3 Thomas' (1992) summary of monetary studies and differences in national accounts in 12 OECD countries

Country		Method <sup>1)</sup>			
		Differences in national accounts	Gutmann's method	Feige's method	Tanzi's method or a variant
Australia	1979	10.7% GDP			
Belgium	1965	18.6% GNP			
	1970	18.9% GNP			
Canada	1976		14.0% GNP	22.0% GNP	
Denmark	1975	6.0% GNP			
France	1965	23.2% GNP			
	1979				6.7% GDP
Greece	1975		15.4% GDP		
	1980		6.8% GDP		
Norway	1978				6.3% GDP
Sweden	1968	5.0% GNP			
	1978	4.7% GNP	12.1% GNP		
	1979	6.4% GNP			
Switzerland	1980		3.7% GNP		
W.Germany	1968	12.4% GNP			
	1974	4.8% GNP		20.0% GNP	
	1980				12.6% GNP
UK	1963	2.0% GNP			
	1968		18.8% GNP		
	1969			11.0% GDP	
	1972		16.2% GNP		5.0% GDP
	1974			22.0% GDP	
	1975			14.0% GDP	
	1977		7.5% GNP		
	1978	3.0% GNP			7.0% GDP
	1979		7.2% GNP	15.0% GNP	
USA	1948	9.4% GNP			
	1968		5.8% GNP		
	1970		6.2% GNP		
	1974		6.3% GNP		
	1976		11.0% GNP	22.0% GNP	
	1977	4.0% GNP			
	1979		13.5% GNP	33.0% GNP	

Note: <sup>1)</sup> The technique used in these methods will be discussed in more detail in chapter 3.

Source: Thomas (1992, p. 335).

Apart from the shadow economy, Thomas also deals with the value of production in households and the extent of criminal activities, together with the size of the shadow economy in developing countries. However, there is no detailed discussion of the various theoretical explanations for the shadow economy. There is in Pyle (1989), on the other hand, who devotes a whole chapter to theoretical contributions.

As mentioned above, Cowell (1990) devotes the most attention to theoretical contributions. He presents an excellent outline and review of microeconomic

theory on the shadow economy. Cowell also includes the main empirical contributions, though the empirical results are presented very briefly (10 pages), since the main emphasis is on theory. Obviously, therefore, Cowell does not discuss the various measurement methods as thoroughly and critically as either Pyle (1989) or Thomas (1992). Cowell presents a table showing where the most important empirical estimates can be found, but he does not reproduce them, so the table is not shown here either. Apart from this, he refers to many of the research results which Pyle (1989) and Thomas (1992) also refer to.

### **2.3 Anthologies on the shadow economy in various countries**

#### **Tanzi (1982):**

Vito Tanzi is probably one of the most quoted researchers in the literature on the shadow economy. This is especially due to his work (Tanzi, 1980) on the measurement of the shadow economy based on monetary methods (see also chapter 3).

*The Underground Economy in the United States and Abroad*, 1982, is edited by Tanzi, and, as the title shows, focuses on the USA. But it also contains articles on the shadow economy in Europe. The book consists of a number of contributions by various authors, several of which are reprints of previously published articles, while others have been presented at various conferences.

Tanzi's book is divided into four parts. Part 1 is of a more general nature, with a short outline by Frey & Pommerehne (1982) of the various methods that have been developed to determine the extent of the shadow economy. Part 2 focuses on the shadow economy in the USA. Tanzi's article from 1980, "Underground Economy and Tax Evasion in the United States: Estimates and Implications", is reprinted here, in chapter 4. The results in chapter 4 concern the period 1929-76. In chapter 6, Tanzi estimates the size of the shadow economy again, using the same method, though this time adding an extra four years, covering the period up to and including 1980.

Part 3 deals with the shadow economy in the UK, Italy, Norway, Sweden and the Soviet Union. The contributions on the UK are by Macafee (one chapter) and Dilnot & Morris (one chapter). Pyle (1989) also refers to their results (see table 2.2 above). The chapter on Norway is written by Isachsen, Klovland & Strøm. Their results come partly from a questionnaire survey from 1980, which is discussed in detail in chapter 6 in this book. Del Boca & Forte have contributed a chapter on Italy, as has Contini. Contini's results are also discussed in Pyle (1989), see table 2.2 above. The chapter on Sweden is written by Hansson, whose estimates of the shadow economy, based on differences in national accounts figures, are pursued further by Tengblad (1994). These results will also

be discussed more thoroughly in chapter 6 below. As pointed out by Tanzi, these chapters differ in many ways, due to differences in the authors' approaches to the topic.

Part 4 of the book deals with the shadow economy in selected countries: Canada, Colombia, Australia and Israel.

Tanzi concludes that, while the shadow economy is too big to be ignored, it seems to be less extensive than the attention of the press would suggest. And, according to Tanzi, there is no evidence to suggest that it has grown drastically in recent years (up to 1982), although it has shown a certain tendency to increase.

**Gaertner & Wenig (1985):**

As mentioned in the introduction, there was a conference on the shadow economy in 1983 in Bielefeld, Germany, where analyses from over 60 researchers from the USA, Europe and Israel were presented. Some of these have been published in *The Economic of the Shadow Economy*, edited by Wulf Gaertner and Alois Wenig (1985).

Gaertner & Wenig's book is divided into six parts, which discuss conceptual questions, empirical results, theoretical approaches, policy implications and production in households respectively. The final section is devoted to command economies, in particular those in the former socialist economies in Hungary and the Soviet Union.

The empirical sector, which is of particular interest here, contains contributions from Austria (Skolka), Switzerland (Frey & Weck-Hanneman), Holland (Broesterhuizen), Belgium (Pestieau) and the USA (J.D. Smith), while O'Higgins examines how the growth of the formal economy influences the growth of the shadow economy.

Skolka discusses six different contributions on the estimation of the shadow economy in Austria. These differ widely in both method used and the part of the shadow economy they examine. For example, some focus only on construction and agriculture, while another also includes DIY activities. According to Skolka, the shadow economy in Austria constituted just under 4% of GDP in 1976.

Frey & Weck-Hanneman have also examined a number of different methods for determining the extent of the shadow economy in Switzerland. In one of the more curious methods, the authors asked 26 experts from different Swiss institutions to give an opinion on the size of the shadow economy and which sectors in

particular it affects. It is impossible to say what these experts' evaluations are based on, and the authors themselves say that the results are based on the experts' subjective assessments.

In addition to this, Frey & Weck-Hanneman examine a number of other methods for determining the size of the shadow economy as they define it. Not all methods are suited to the Swiss data, however. For example, differences in national accounts figures give higher revenues than expenditures, which, according to the method, should result in a negative shadow economy. Similarly, it is not possible to use the difference method (between expenditure and income) in household budget surveys because of missing data in Swiss statistics. Thus, the authors say, they are obliged to use monetary methods to determine the size of the shadow economy in Switzerland. They refer here to results of estimations based on Tanzi's (1982) method, which have been carried out by Friedrich Schneider (who, incidentally, has also used the same method for Denmark – see also chapter 3). According to these estimations, the shadow economy in Switzerland was approximately 3.7% of GDP in 1980.

Authors who cite studies of the shadow economy carried out by means of questionnaires often mention Pestieau's contribution on Belgium. Pestieau carried out a small questionnaire survey in Liège in Spring 1983, consisting of 330 interviews on both the purchase and sale of black activities. This showed that about 47% of the adult population over 14 years of age admitted to having had income from black activities within the past year, while 36% had paid for such activities. On average, people carrying out black activities spent 9.4 hours a week on them, corresponding to approximately 14% of total working hours in the formal economy – see also table 2.2 above. This is above the level in both Denmark and Norway. Pestieau does not use these figures for Liège to estimate the overall size of the shadow economy for Belgium, however. Furthermore, there is no mention of the non-response rate for the survey as a whole or for the question on the shadow economy, nor are any of the questions reproduced.

Michael O'Higgins' contribution has also often been cited. O'Higgins examines the relationship between the shadow economy and the formal economy in the USA, Canada, Germany and the UK. He finds that the shadow economy has a positive correlation with both the formal economy and inflation. On the other hand, contrary to widespread belief, O'Higgins has been unable to find a clear relationship between the shadow economy and unemployment.

O'Higgins has used time series data to illuminate the relationship between economic growth in the formal and informal economy. His estimates for the selected countries thus come either from monetary methods or from differences in national accounts figures.

The main Dutch contribution from Broesterhuizen, in Gaertner & Wenig (1985), will be discussed in more detail in chapter 3 below.

Finally, it should be mentioned that Isachsen & Strøm also contribute a chapter to the theoretical section in Gaertner & Wenig (1985). These authors present a model for the shadow economy and examine the model's results using empirical data collected from questionnaire surveys in 1980 and 1983. Their analyses will also be discussed below, in chapter 6.

**Feige (1989):**

Most of the contributions in Feige (1989) were originally presented at a conference on the shadow economy in Holland in 1982. The purpose of the conference was to create an international forum for economists, where they could discuss the problems of tax evasion, black activities, and the consequences of lost tax revenue for the state. Participants at the conference were asked to examine and evaluate the various countries' studies on the shadow economy, which could be compared with similar studies in the USA.

Feige (1989) is divided into three parts. Part 1 consists of four chapters, which discuss the content of the various terms for the shadow, or underground, economy. This section also includes a discussion on the problems faced by the State in trying to conduct a "sensible" economic policy if the economic statistics on, for example, unemployment, inflation, etc., misrepresent the "true" state of the economy, due to the existence of an undocumentable shadow economy.

Part 2 presents empirical contributions on the determination of the size of the shadow economy. These concern the USA (Porter and Bayer), Holland (Broesterhuizen), the UK (O'Higgins), W. Germany (Langfeldt), Sweden (Hansson), Italy (Contini), Norway (Isachsen & Strøm), Canada (Mirus & Smith) and France (Barthelemy). Many of these authors also appeared in Tanzi (1982) and Gaertner & Wenig (1985): Broesterhuizen, O'Higgins, Hansson, Isachsen & Strøm, Langfeldt and Contini. Finally, part 3 deals with the shadow economy in command economies, here the former Soviet Union and Hungary.

Feige (1989) includes many of the authors who have already been published in Tanzi (1982) and Gaertner & Wenig (1985). There is therefore the same big variation in methods used and estimates of the shadow economy for the respective countries in Feige (1989) as in these two previous publications.

**Barthelemy et al. (1990):**

In 1990, the EU published a report on the shadow economy entitled "*Program for Research and Actions on the Development of the Labour Market. Underground Economy and Irregular Forms of Employment (Travail au Noir)*", writ-

ten by Philippe Barthelemy, Fausto Miguelez, Enzo Mingione, Raymond Pahl and Alois Wenig. The publication of the report had been preceded by a series of meetings and discussions on the subject over a period of eighteen months.

However, the introduction to the book clearly showed that the various authors could not agree among themselves, which is why there is no joint conclusion. Unfortunately, the report (619 pages) does not say precisely what the authors disagreed about – whether, for example, they could not agree on a common frame of reference, and with it a definition of the shadow economy, or on the ability of the methods used to measure the size of the shadow economy. Nor is there any indication that the special structure of the programme – with researchers being commissioned by public officials – played a part. Furthermore, there is no section in the report on how the shadow economy is defined, which is normal in other researchers work on the topic.

The report can be divided into two parts, the first of which consists of 7 sections with contributions from the authors. These include the historical background of the shadow economy and a number of theoretical discussions on the extent to which competition in a given market is likely to influence the existence and development of a shadow economy in this market. Is it true, for example, that competition from low-wage countries in eastern Europe and Asia has forced manufacturers in the textile industry in Portugal to hire “black” labour? Other industries, e.g. the chemical and car industries in Germany, also have to contend with keen competition, but this does not seem to have led to a black economy in these sectors. Thus, no firm conclusion can be drawn about the extent to which competition influences the shadow economy on the basis of the theoretical discussions in the report.

In the second part of the report, Raymond Pahl draws attention to some tendencies in the various contributions which include figures for the size of the shadow economy. Pahl comes to the same conclusion as in the above, namely that it is very difficult to compare the shadow economy across countries and that a precise definition and limitation of the term is needed.

Despite the disagreements about definition and methodology, the five researchers agree that there is no clear connection between unemployment and black activities. According to Pahl, all five agree that black activities by the unemployed is insignificant.

The figures for the extent of the shadow economy in the (then) 12 EU countries are examined by the authors in 10 separate chapters. As with the above-mentioned comparisons of the shadow economy between countries (section 2.2),

the EU report is also based on a review of the existing literature. It therefore contains no new estimates of the size of the shadow economy.

#### **United Nations (1992):**

The UN's "Economic Commission for Europe" held a conference on the shadow economy between September 16-18, 1991. In connection with this conference, a number of articles on the topic were collected by the secretariat and published in *Guidebook to Statistics on the Hidden Economy*. The book thus consists of a number of articles that have previously been published elsewhere – in common with several other of the books mentioned here.

The book contains 18 articles in all, which are considered among the most important contributions published on the subject since 1980. Most of the articles deal with methodological aspects of the shadow economy, focusing in particular on the relation between the shadow economy and the national accounts, and on estimates of the extent of the shadow economy.

Among the methods used to estimate the size of the shadow economy included in the book are: Comparisons of tax revenue figures from the tax authorities with those in the national accounts, comparisons of revenues and expenditures in the national accounts, and surveys of households and individuals concerning their activities in the shadow economy.

No attempt has been made to summarise all the various efforts to define and estimate the size of the shadow economy. Some of the articles in the book – by, among others, Rob van Eck and Brugt Kazemier – will be discussed in more detail in chapter 6 below, on the extent of the shadow economy in Holland.

#### **2.4 Closing remarks**

The review of foreign researchers' attempts to compare the shadow economy in different countries reveals many similarities. Firstly, there is no common definition of what is actually meant by the shadow economy, underground economy, black economy, etc. And secondly, widely different methods are used to estimate the extent of the shadow economy. Which method is used depends a lot on the availability of data. Finally, a joint research project by Smith and Wied-Nebbeling (1986) to compare the shadow economy in W. Germany and England also deserves mention. The results for England are reported separately in Smith (1986), while those for W. Germany are published in Petry & Wied-Nebbeling (1987).

Smith and Wied-Nebbeling's joint research project differs from those mentioned above in at least three ways. Firstly, it compares the shadow economy in only two countries. Secondly, the authors propose a common definition of the

shadow economy – although the actual methods they use to measure this are different. Thirdly, it ends with a joint conclusion which, despite the different measurement methods used, ventures a qualified estimate as to the size of the black economy in the two countries.

This book tries to avoid some of the pitfalls of comparing the shadow economy in different countries. Chapter 6 thus focuses on countries which have used the questionnaire method to estimate the size of the black economy.

Before discussing the questionnaire method, chapter 3 takes a closer look at some of the other methods that have been developed to estimate the size of the shadow economy.

### **3. Different ways of measuring the shadow economy**

#### **3.1 Introduction**

This chapter presents a brief description of the many different methods that have been developed to measure the extent of the shadow economy over the years. The focus is on the key elements of the methods, including their strengths and weaknesses. Where the method has been used to measure the size of the shadow economy in a European country, this is mentioned.

#### **3.2 Overview of the methods**

The methods are often divided into two main groups of so-called direct and indirect methods. Direct methods include:

- (a) The auditing of tax returns
- (b) Questionnaire surveys

By indirect methods is meant that researchers try to measure the “traces”, so to speak, which the shadow economy leaves in the official statistics. Indirect methods include:

- (c) Differences between income and expenditure at household level
- (d) Discrepancies in the national accounts
- (e) Differences between officially measured participation rates and actual participation rates
- (f) Monetary methods
- (g) The so-called model approach

#### **3.3 Direct methods**

Direct methods of measuring the shadow economy are based on contact with or observation of persons and/or firms. Questionnaire surveys are by far the most common method, either in the form of telephone interviews, face-to-face interviews or postal questionnaires. This type of survey has been the most widely used in Denmark in studies of black activities, and is dealt with in more detail in chapter 5 and 6. With the exception of promising Danish research into the ability of the official statistics to measure as much as possible of the shadow economy and black activities, these are therefore not discussed further in this chapter.

Statistics Denmark has pioneered the inclusion of, among other things, income from black activities in household budget surveys, and published the first results of this (covering 1994) in 1997, cf. *Nyt fra Statistics Denmark* (1997:292).

While the methodological considerations behind this attempt to expand the household budget survey have still not been published, the results do not appear to be all that different from those obtained up to now from questionnaire surveys in Danish research (see chapter 5).

According to the social science literature on methodology, obtaining reasonably reliable answers to interview questions about sensitive topics requires the use of special, and carefully prepared, interview techniques. Typically, this will include instructions to the interviewer and careful design of the questions in order to overcome any reluctance to answer, and, by means of examples, trying to explain precisely what should and should not be regarded as “black activities” (see also the special report on these problems from the Rockwool Foundation Research Unit – Viby Mogensen et al., 1995). It is hard to know exactly how much information is lost by merely asking a short question of the type “What kinds of black income have you had?”, which, for example, was the case in the aforementioned first attempt to expand the new Danish household budget surveys. When the Danish National Institute of Social Research carried out two omnibus surveys for the Rockwool Foundation Research Unit in 1996 using the method mentioned above, 23% of respondents replied yes to a question on whether they had been engaged in black activities themselves during the past year. When the Institute asked almost the same question in another context later in the year, but without including any precise explanation of black activities, only about 12% answered yes to the question.

At a rough guess, Statistics Denmark’s attempt to expand household budget surveys with a short question on black income succeeded in getting approximately every other person involved in black activities to answer. These persons were then asked about the cash part of payment for black activities, which, according to Danish research, has averaged about one third in recent years. The guess that the 1994 household budget survey had identified about one sixth of the amount usually measured in Danish research is borne out by the fact that the survey’s figure for black income was approximately DKK 2 bn, while Danish research came to a total figure for 1994 at the upper end of the interval DKK 9-15 bn (cf. chapter 5).

### **3.3.1 Auditing of tax returns**

The observation of persons and/or firms is based on careful audits of taxpayers’ information to the tax authorities. Audits of taxpayers’ own information about income and deductions can, to some extent, reveal whether such information is correct. Based on the errors the tax authorities find in tax returns, it is therefore possible to get an approximate idea of the overall extent of tax evasion.

One advantage of the method is that it gives a precise idea of which industries and income groups in particular avoid paying their rightful tax. This is not possible with the indirect methods based on macro-figures (see below).

Based on Riksskatteverket's (the Swedish Tax authorities) audit statistics, Malmer & Persson (1994) report that, for Sweden, discovered errors in tax returns amount to 19% of value added, corresponding to 13% of GDP for the period 1990-92. Hansson (1980, 1989) mentions Riksskatteverket's statistics for 1978, which show that non-declared income amounted to between 8% and 15% of declared income. These results come from Riksskatteverket's detailed audits of tax returns.<sup>2</sup>

The Swedish results should be interpreted cautiously, however. In the first place, they were not based on a random sample of tax returns. The results are from Riksskatteverket's audits, which were not carried out for the purpose of estimating the extent of tax evasion, but as part of its control measures. The most serious criticism of the method is precisely the lack of representativeness.

But non-representativeness is not the only problem. As pointed out by Malmer & Persson (1994), an audit of a representative sample would still not be able to detect so-called "non-filers", i.e. persons or firms who are unknown to the authorities. The method also has difficulty in identifying black activities, unless it is so blatant as to be reflected in unexplainably high consumption and savings compared with declared income. Moreover, the method is vulnerable, inasmuch as only extremely painstaking audits can reveal tax evasion. In addition, the precision and quality of the audits can vary from audit to audit, and from year to year, cf. Simon & Witte (1982).

### **3.4 Indirect methods**

Cowell (1990) has described the indirect methods in very expressive terms, saying that these approaches can be compared with counting how many molehills there are in your garden! Indirect methods build on the assumption that the shadow economy leaves a number of clues on the surface, from which it is possible to form an idea of what is going on below.

#### **3.4.1 Differences between income and expenditure at household level**

On the basis of household budget surveys, it is possible to compare income and consumption at the individual level. Consumption is typically measured by ask-

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<sup>2</sup> The method was first used in the USA. Simon & Witte (1982) report that, based on a random sample of 50,000 taxpayers, the total under-declaration of legal economic activities (tax evasion + omitted income from illegal immigrants) was estimated at USD 63-84 bn, corresponding to 4-6% of the USA's GNP in 1974.

ing a random sample of the population to carefully record their consumption over a period of, say, a fortnight, and to also disclose their income and savings.

If expenditure exceeds income, it could be because the household has had other income in addition to declared income. Dilnot & Morris (1982) have used this method in British Family Expenditure survey from 1977. The survey is based on information about income and expenditure from 7200 households. According to Dilnot & Morris, the shadow economy constituted between 2.3% and 3% of GNP in 1977. The survey revealed that it was especially the self-employed who were active in the shadow economy.

Pissarides et al. (1986) and Pissarides & Weber (1989) have also used a Family Expenditure survey from the UK to examine the activities of the self-employed in particular in the shadow economy. The principle involved in the study is discussed below, but the review is based on Apel (1994), who has used the method on Swedish data.

There is no actual definition of the shadow economy in Apel (1994), but since the method is based on Pissarides & Weber (1989), which was first published in Smith (1986), it is presumably defined as activities which should normally be disclosed to the tax authorities, but which are not. This is what would be called the shadow economy in Danish terms, so this is the term used in the discussion of Apel's study.

Apel estimates the size of the shadow economy based on the Swedish survey from 1988. This survey is a sample survey, which includes information about disposable income and consumption expenditure. The data also includes related data from various registers on, among other things, income. The response rate was 63. Information was collected from a total of 3764 households.

Briefly, Apel's method consists in comparing consumption and disposable income for wage-earner and self-employed households. A main assumption of the method is that wage earners have disclosed their income and consumption truthfully. And it is also assumed that both wage earners and the self-employed in the survey disclose all consumption expenditure correctly. It should be noted, however, that Apel does not include farmers, since they largely produce their own food. Farmers' consumption expenditure is thus probably somewhat different from the rest of the population.

A further main assumption of the analysis is that it is only the self-employed who under-declare their income. The method thus measures this group's tax evasion. This is due to the fact that Smith (1986) found that, in England, the self-employed in particular have numerous possibilities for evading tax, in part,

of course, because they disclose their income to the Inland Revenue themselves. Wage earners' tax is paid directly to the Inland Revenue by their employers, who deduct it from wages. This greatly reduces their possibilities for keeping income hidden from the tax authorities, therefore. Furthermore, the self-employed can claim a lot more deductions than wage earners, and thus have more possibilities for exaggerating them in order to evade tax.

By assuming that wage earners and the self-employed correctly declare their consumption expenditure, a function can be estimated to determine consumption. This function includes a number of variables that help explain consumption, and, providing all other characteristics are identical, a wage-earner household and a self-employed household can now be compared. It is now assumed that the "true" average income of the self-employed is the same as that of wage-earner households with the same characteristics at this income level. This estimated "true" income for the self-employed is thus determined indirectly via their consumption by assigning the self-employed person the income of a wage earner with the same consumption, and where all other characteristics are otherwise identical. The "true" estimated income is thus higher than the disclosed income in the household budget survey.

Technically, a special statistical analysis (regression analysis) is carried out, using consumption as the dependent variable. In addition to various explanatory variables, this statistical analysis also includes a variable to identify the household concerned as a self-employed or wage-earner household. It is therefore crucial to the method that this variable has a significant explanatory value. However, the variable is insignificant in an estimation using the Swedish data in which all self-employed households are included. It is only significant in an estimation which does not include the self-employed who own a limited company (this can be seen from the Swedish Companies Registry, where their income appears in the form of salary or dividend). It is not wholly unreasonable to exclude the self-employed who own a limited company, however, since, according to Apel, this type of company is probably subject to stricter control than other self-employed persons.

In the original English estimate, the variable is significant in 4 out of 8 estimated regressions, cf. Smith (1986) and Pyle (1989).

According to Malmer & Persson (1994), a further problem with the method is that the self-employed are probably better able to get discounts on their purchases of consumer goods. Consumption expenditure between the self-employed and wage earners is thus not directly comparable.

Apel claims that, to obtain the real income level of the self-employed, their declared incomes should be adjusted upwards by 35%. For the group of all self-employed, where the main variable is not statistically significant (see above), Apel finds that income should be adjusted upwards by 25%.

As mentioned above – and which both Apel and Pyle (1989) point out – the fact that the method is based on the assumption that all wage-earner households disclose their income correctly is a serious problem. Skilled workers are also active in black markets, as, for example, Laurin (1986) has found. Apel therefore carries out a new analysis, in which – somewhat less unrealistically, though still problematical – only public-sector employees, who must be assumed not to have any possibilities of evading tax, are used as a reference group for the self-employed. He now finds that the incomes of the self-employed should only be adjusted slightly upwards, but the main variable is now insignificant. According to Apel, however, this could merely confirm the original supposition – that wage-earner households in Sweden do not disclose all their incomes correctly.

According to Apel, the registered income of the self-employed constitutes 2.5% of GDP. Using the above-mentioned estimate of the extent of tax evasion, Apel estimates that tax evasion by the self-employed amounts to less than 1% of GDP. As will be seen in the next section, this is quite a bit below the level for the shadow economy reached by Tengblad (1994). Pyle (1989) and Malmer & Persson (1994) also find the method interesting, but with the aforementioned weaknesses in mind, its results should be interpreted with caution.

As with the tax authorities' audits of declared incomes and deductions, the advantage of the method based on household budget surveys (at least, Dilnot & Morris' (1982) method) is that it is possible to identify population groups that are especially active in black markets.

Dilnot & Morris' method is not without its problems, however. For example, even if respondents are completely honest and declare all their income – including income from the shadow economy – it will not be measured anyway, since it is assumed that people with income from the shadow economy will not declare it. It is also assumed that black income is spent, and not, for example, put into a Swiss bank account. Dilnot & Morris exclude the unemployed in their study, since this group has a lower income during unemployment. According to Dilnot & Morris, the difference between income and consumption for the unemployed thus cannot be attributed to participating in the shadow economy. Excluding the unemployed is problematical, however, since precisely this group might be thought to have a need for extra income as a consequence of being unemployed, cf. Pyle (1989).

The method used by Pissarides & Weber (1989) and Apel (1994) also has drawbacks, as pointed out by, among others, Malmer & Persson (1994) and Pyle (1989), since it implicitly assumes that wage earners disclose all their income truthfully. But, as is shown for Denmark (see also chapter 5), this assumption is not valid, since wage earners, and skilled workers in particular – in Denmark at least – are very active in the shadow economy.

Finally, it can be mentioned that Niels Ussing (1953) and the Danish National Council of Economic Advisors (1967) have tried to determine the scale of tax evasion for wage-earner households on the basis of household budget surveys in 1948 and 1963 respectively. Both studies strongly warn against uncertainty in the results, which show an “evasion percentage” for wage-earner households of about 10-15% in 1948 and 7% in 1963.

### **3.4.2 Discrepancies in the national accounts**

Statisticians use many different statistical sources when drawing up the national accounts. By comparing some of these different statistics, and at the same time trying to adjust for differences in definition, it is possible to get a fair idea of the size of the black economy.

The Danish National Council of Economic Advisors (1967, 1977) has thus attempted – while at the same time emphasising the uncertainty involved – to estimate the scale of tax evasion in Denmark by comparing total incomes in 1963 according to tax statistics with total personal net incomes based on the national accounts. This comparison shows that the figure for incomes according to the tax statistics is less than that derived from the national accounts statistics. This difference was estimated at between DKK 5-6 bn in 1963, corresponding to 11-13% of personal net income. In 1977, the Danish National Council of Economic Advisors made a similar estimate for the beginning of the 1970s. The Council found a fall in total under-declaration, from a level of around 10% of personal net income in 1970 to approximately 6% in 1975.

As indicated above, however, this method is not foolproof either. As pointed out by the Danish National Council of Economic Advisors (1967, 1977), the difference between total incomes derived from the tax statistics and total incomes derived from the national accounts is not just a reflection of the size of non-declared incomes. It also reflects differences in definitions of income, the assessment of benefits in kind, consumption of own products, etc. In addition, as pointed out by Stetkær (1983), the Council’s figures are based on national accounts figures that have later been revised. Stetkær estimates the difference to be nearer 4% in 1975. It should be noted that this method misses a lot of black activities.

Finally, Statistics Denmark (1991b) has calculated – though without seeking to determine the scale of tax evasion or to relate the difference to this issue – that, in 1988, incomes according to national accounts statistics were 3.9% higher than incomes according to tax statistics.

Petersen (1982) has compared the difference between incomes reported to the tax authorities and incomes according to the national accounts for W. Germany. As expected, the latter is higher than the former. After adjusting for differences in definition in the two sets of statistics, Petersen (1982) estimates this difference to be 16% of the national product in 1964, falling to 4.8% in 1974, which is the same development that the Danish National Council of Economic Advisors (1967, 1977) found for Denmark in the same period.

In principle, the gross domestic product can be calculated in three different ways, namely by the production statistics method, the expenditure statistics method and the income statistics method, cf. Thage (1990). Which method is used depends on the type of primary statistics available to national accounts statisticians. In Britain, GDP is estimated using all three methods.

For Britain, Macafee (1980) has compared GDP calculated from the demand side (the expenditure statistics method) with GDP calculated from the income side (the income statistics method). Macafee assumes that the former is correct, and not influenced by, for example, tax evasion, since it is mainly based on Family Expenditure surveys. The estimate of GDP from the income side is underestimated, however, being based on information from the Inland Revenue, which does not include income from black activities or tax evasion. By comparing GDP calculated from the income side and demand side respectively, which Macafee (1980) calls “Initial Residual Difference” (IRD), he arrives at a figure for the black economy of 3.3% of GDP in 1978.

This method is also subject to considerable uncertainty. For example, Smith (1986) has shown that, since Macafee’s publication, “IRD” has continued to fall, becoming negative in 1984. Therefore, “IRD” can probably only be interpreted as a reflection of random fluctuations in the underlying statistics used to estimate GDP.

Tengblad (1994) attempts to determine the extent of black activities and tax evasion in Sweden in the period 1980-91. A similar study has been carried out by Hansson (1984) for the period 1970-81. Tengblad (1994) uses the same method as Hansson (1984), but since the national accounts have been substantially revised in the meantime, the results for the overlapping years cannot be directly compared.

According to Tengblad, the national accounts are well suited for estimating the extent of black activities and tax evasion, since, in principle, they cover both correctly and incorrectly reported activities, as well as activities not reported at all. But the national accounts cannot capture all activities in the black economy. Tengblad does not say how big a proportion this involves.

In principle, some illegal activities, such as smuggling, illicit distilling, prostitution and drug dealing should be included in the national accounts, since they are voluntary transactions between buyer and seller (see chapter 1 and 4 in this book). But since in practice it is impossible to obtain reliable figures for this part of the underground economy, these activities are left out. Other illegal activities, e.g. robbery or extortion, are omitted from the national accounts since, of course, they are neither productive activities nor voluntary transactions. Tengblad's figure for the black economy thus ignores illegal transactions, whether they should, in principle, be included in the national accounts or not. This is also in accordance with national accounting practice in other countries (see chapter 4 below).

In his definition of the black economy, Tengblad does not distinguish between black activities in a narrow sense and tax evasion, as in the Danish studies. Since Tengblad uses the national accounts to estimate the size of the black economy, his figure also includes – unlike the Danish figures reported in chapter 5 – private companies' tax evasion.

The size of the black economy is estimated by looking at various discrepancies and residuals in the national accounts. As a rule, this is done by comparing the overall estimate of the national accounts, which contains the main part of the black economy, with estimates based on certain areas of the primary statistics, which solely reflect the formal economy.

Both incomes and expenditure are measured in the national accounts, but since they are based on different statistical sources, with consequent discrepancies, it is necessary to balance these in accordance with accepted accounting principles. Since, for tax reasons, the tendency to under-report is assumed to be greater for income than for expenditure, the estimate from the expenditure side is assigned the biggest weight in the estimation of total economic activity.

Tengblad's estimates are thus an attempt to determine how big a part of the figure for total economic activity, which is measured in the national accounts, comes from the black economy. The figures for the black economy in the following thus cannot be interpreted as meaning that the national accounts figures for total economic activity are underestimated by a corresponding amount.

Tengblad divides the black economy into four parts in his estimations: Black wages, an income residual, non-declared operating profits and non-declared property income. As mentioned above, Tengblad estimates the size of the hidden economy by looking at various discrepancies and residuals in the different sources on which the national accounts are based.

An exception is his estimate of *black wages*, which is an estimate based on the wage costs of certain industries. He does not explain precisely how he does this, however, merely saying that: “Therefore a rough estimate of the total sum of wages in certain industries has been given, especially in the building industry, the trade industry and other service industries” (p. 387). Tengblad’s table 2 is a breakdown of black wages by industry. It is especially the construction, trade and certain service industries he focuses on here. Tengblad emphasises (p. 394), however, that there is no empirical support for his distribution of black wages by industry. Earlier (p. 387), he claimed that there is more sense in giving a rough estimate of black wages than in not giving an estimate at all.

The above-mentioned *income residual* is determined by first calculating savings as the difference between, on the one hand, an estimated amount for incomes, which includes the estimate for black wages mentioned above, and, on the other hand, an estimated amount for total expenditure. The data on estimated expenditure comes primarily from consumption expenditure according to the household budget surveys.

This estimate for savings is compared with the figure for savings which can be estimated from detailed statements of bank account balances. This data comes from the banking system’s creditor and debtor accounts by sector. A comparison of the two shows that estimated savings are considerably below the level of actual savings according to the data from the banking system. An amount is therefore added to the estimate for income (which also includes black wages) to bring estimated savings up to the same level as actual savings. The figure in the 1980s was SEK 10 bn, which was adjusted after 1985 by the change in the price level.

The estimated income residual is higher than estimated black wages for all years. According to Tengblad (p. 387), this means that the estimate for black wages was too low in all years and should therefore be higher.

*Non-declared operating profits* are determined by comparing the estimated operating profits from farming, forestry, trade, etc., in the national accounts with the operating profits from income statistics, which measure the formal part of the economy. According to Tengblad (p. 394), the distribution between the levels for black wages and non-declared operating profits is extremely uncertain.

As mentioned above, this is due to the fact that the figure for the income residual exceeds the estimate for black wages. However, taking a starting point for the calculation of non-declared operating profits in the national accounts figures for operating profits avoids the problem of double counting mentioned in chapter 4.

*Non-declared property income* is estimated by looking at the difference between national accounting figures for interest and dividends on the one hand and corresponding figures from the tax statistics on the other. In order to make such a comparison, however, it was first necessary to revise the national accounts figures downwards for items that are not subject to tax or which concern households only.

In a Danish context, the car repair industry can be used to illustrate Tengblad's method. According to Viby Mogensen (1985) and Statistics Denmark (1991a), in the Danish national accounts, the value of output of car repairs is calculated by multiplying the number of cars in various categories by the estimated average figure for repairs in each category. In other words, the national accounts make no distinction between formal and black car repairs. If it was possible to compare this estimated value of output with the value of output obtained, for example, from the tax authorities' figures, it would very likely show that the national accounts estimate is higher than the official figure. The difference would then be the figure for black car repairs.

In all, black wages, the income residual and non-declared operating profits amounted to SEK 28 bn in 1980, corresponding to 5.4% of GDP. By comparison, Hansson (1984) found that, in the period 1979-81, the black economy constituted between 4.7% and 7.5% of GDP.

In 1991, black wages, the income residual and non-declared operating profits amounted to SEK 67 bn, corresponding to 4.6% of GDP. If non-declared property income is included, this figure rises to SEK 71 bn, or 4.9% of GDP in 1991. Of this, black wages and the income residual alone accounted for over SEK 26 bn in 1991, or 1.8% of GDP.

The size of the black economy as measured by the national accounts figures is thus not far from the Danish measurements of black activities by means of questionnaire surveys.

According to the national accounts figures, the black economy contracted slightly in the 1980s. The tax burden increased during the same period, however, and since a large part of the black economy is due to taxation, Tengblad thinks that this alone indicates that a larger and larger part of the black economy

in Sweden goes unrecorded in the national accounts. However, Tengblad examines this using other sources in the national accounts, and concludes that they cannot confirm this. It is therefore solely the fact that the black economy has contracted at the same time as taxes have increased that indicates a falling ability of the national accounts to measure the black economy.

Kazemier (1991) has examined the extent of tax evasion on interest received in Holland (see also chapter 6 below). He compares the national accounts figures for total household interest received with the tax authorities' data on households' payment of tax on interest received in Holland for 1977, 1979 and 1981. In the Dutch national accounts, total household interest received is based on information from the central bank, banks, giro account balances, pension funds, etc., while the tax authorities' information comes from tax returns. Before the two estimates are compared, however, they are adjusted for certain differences in the statistics, e.g. differences in the definition of a household.

As expected, the comparison shows that the national accounts' figures for interest received are higher than the tax authorities'. Kazemier (1991) estimates that tax evasion on interest received is 1.2% of GNP in 1977, rising to 1.9% of GNP in 1981. According to Kazemier, this is probably an underestimation, since the method used cannot take account of all reservations and differences in data.

By means of a "sensitivity analysis", Broesterhuizen (1985) examines how much the Dutch national accounts are underestimated as a result of non-reporting or under-declaring income. There are thus no actual estimates for a single year or number of years.

The "sensitivity analysis" is carried out by dividing the national accounts into six categories. The first category consists of sectors and industries (e.g. oil and natural gas production, the oil industry, housing) where the estimates in the national accounts are based on indirect figures. Agriculture also belongs to this category, where production is estimated by means of a price-times-volume calculation, as in the Danish national accounts. Category 2 includes the public sector and, among others, banks and insurance companies, the railways and communications, while category 3 and 4 contain large and small firms respectively. Category 5 consists of very small firms, and category 6 those businesses where the GDP statistics are based on information from the tax authorities. Broesterhuizen (1985) examines each category to see whether the national accounts figures are underestimated. Activities in category 1 and 2 are generally not reckoned to be underestimated as a result of activities in the black economy. Together, these two categories account for over 53% of GDP in Holland. After checking each category, Broesterhuizen (1985) finds that, on the whole, the

national accounts have been underestimated by no more than 5% as a result of activities in the black economy.

Broesterhuizen (1985) also examines the six categories to find out what influence black activities have had on the growth in GDP. He finds that, even with a particularly high growth in the black economy, the growth in GDP is not likely to be underestimated by more than 0.5%

The Italian central bureau of statistics (ISTAT) has thoroughly revised the national accounts in Italy, cf. Siesto (1992). This was done on the recommendation of a team of international statistics experts after an examination of the existing Italian national accounts. This resulted in a drastic revision of the national accounts back to 1970, involving a large number of new statistical sources. The most important of these were three censuses of the population and the housing stock, agriculture, and firms outside the agricultural sector. The new statistics focused on those sectors (primarily the crafts, trade, transport and service sectors) which, according to the international experts, were the most poorly covered under the old system.

The aim of the new calculations was not just to determine the value added corresponding to that part of employment which complied with tax legislation or other administrative rules, but also as far as possible to discover the part of value added and employment accounted for by the black economy. Thus, they now also include employees not on official payrolls and wage earners with a second job. Similarly, firms operating without a licence or permit, or which do not keep accounts, are also included. In order to do this, the Italian national accounts statisticians have tried to design censuses that are not dependent on, for example, tax statistics. This also applies to their labour surveys, which, as in Denmark, are carried out by means of large-scale interview surveys.

Based on the national accounts, Siesto (1992) tries to obtain an overall view of that part of the black economy which the national accounts actually covers. He defines the black economy as productive activities which violate either the tax laws or laws on social contributions.

As mentioned in chapter 4 below, the Italian statisticians have gone the furthest in the direct quantification of the black economy. The method they use consists in comparing the value added in the national accounts (after adjusting for both poor statistical coverage of activities which, in principle, are covered by fiscal statistics, and the actual black economy in the form of black activities and under-declaration) with the value added in the tax statistics.

VAT statistics are an obvious source for comparison here, since they calculate a “fiscal” value added, which, after correcting for conceptual differences, can be compared with the national accounts’ value added by industry. The biggest conceptual differences on the output side are that, in the national accounts, value of output includes increases in inventories in addition to turnover, while output VAT includes the sale of used capital goods, which is not included in value of output in the national accounts. On the input side, in addition to the purchase of goods and services subject to VAT, the national accounts also include a number of goods and services which are not subject to VAT, e.g. bank and insurance services. Conversely, input VAT not only includes expenditure on intermediate consumption, but also the purchase of investment goods. In principle, based on the information in the national accounts, it is possible to correct for these conceptual differences. However the distribution by industry is subject to some uncertainty due to differences between statistical production units and VAT accounting units. Notwithstanding these reservations, the comparison is still extremely interesting. Siesto’s comparison for Italy for 1982 is shown in table 3.1.

Table 3.1: Value added in the formal and black economy. Italy, 1982.

Industry	Formal economy %	Black economy %	Total ITL bn
Agriculture	100.0	-	28,000
Industry	89.3	10.7	187,000
- energy extraction, electricity, gas, district heating	100.0	-	13,000
- manufacturing	92.6	7.4	136,000
- construction	73.7	26.3	38,000
Service industries	66.9	33.1	236,000
- recycling and repairs	50.0	50.0	10,000
- wholesale and retail trade	44.4	56.0	75,000
- hotels and restaurants	35.3	64.7	17,000
- transport	95.5	4.5	22,000
- post og telecommunications	100.0	-	6,000
- credit institutions and insurance companies	100.0	-	24,000
- business services	85.7	14.3	21,000
- rental property	100.0	-	31,000
- other services	46.7	53.3	30,000
Public administration and service	100.0	-	65,000
Total value added in producer prices	81.0	19.0	516,000
GDP	82.0	18.0	545,000

Source: Siesto (1992, p. 173)

The table indicates that the size of the black economy in Italy is about 18% of GDP. On the one hand, the above comparison will tend to overestimate the

black economy, since all the difference between the theoretical VAT and the actual VAT payments is attributed to the black economy. In practice, actual VAT payments will almost always be less than the theoretical for reasons not directly connected with the black economy. For example, business bankruptcies mean that the State never sees much of the VAT already paid by consumers. Conversely, 100% of the value added in agriculture and renting on dwellings is attributed to the formal economy, because VAT rules in this area are so special that they make any comparison of the “fiscal” value added with the national accounts impossible. Seen in isolation, this tends to underestimate the black economy. When interpreting table 3.1, the assumptions underlying the Italian national accounts should therefore be taken into consideration. As previously mentioned, it cannot completely be ruled out that value added is overestimated in the national accounts.

The distribution by industry in the table is interesting. The black economy is clearly the most widespread in the service industries, which sell directly to consumers, and which in Italy are dominated by small firms. It is especially noteworthy that the black economy accounts for more than half of the value added in the wholesale and retail trades, repair industry, hotels and restaurants and “other services”.

In France, attempts to estimate the size of the black economy have also led to a thorough revision of the national accounts, cf. Willard (1992).<sup>3</sup> As in the Danish definition of the black economy (see chapter 1), the French national accounts also distinguish between tax evasion and black activities. There are no estimates of actual illegal activities, e.g. drug smuggling and prostitution, which in principle are covered by the national accounts definitions – but which are not included due to lack of data (see chapter 1). It should also be noted that no independent estimates are made of black activities in agriculture, since the value added in this sector is based on a price-times-volume calculation, as in the Danish (and Italian) national accounts.<sup>4</sup> And there are no estimates of black activities for

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<sup>3</sup> Willard (1992) is an English translation of the original article in French, which was published in *Economie et Statistique*, no. 226, Nov. 1989, pp. 35-51.

<sup>4</sup> As regards the Danish national accounts, the so-called price-times-volume calculation for agriculture is described in Statistics Denmark (1991, p.10-19). In the Danish national accounts, crop production is estimated by multiplying crop acreage by average yields for the crops in question. Data on acreage and average yields come from sample surveys of the agricultural sector. As regards livestock production, the data comes partly from the dairies (weighed milk volumes) and partly from the slaughterhouses (number of slaughtered pigs). The national accounts also estimates consumption of own products. Information about production volumes is thus unlikely to be affected by whether or not everything has been sold “with a receipt”. Crop prices and prices for livestock products are obtained from the corn and animal feed industry, Danske Slagterier (The Federation of

public corporations, financial institutions, insurance companies and public institutions either. This is not to say that there are no black activities in these sectors, however, cf. Willard (1992). Willard's method and estimates are discussed in more detail in chapter 4 below.

All in all, the black economy in France was estimated at 3.35% of GDP in 1985. In addition to this, the value added in firms which had not filed tax returns and accounts was estimated at 2.7% of GDP and for levied but not paid VAT at 0.7%. The total estimated figure for the black economy and irregularities in financial reporting thus amounted to 6.75% of GDP.

The extent of the black economy in Austria has also been estimated on the basis of national accounts data, again not without problems, cf. Franz (1985). Thus, only official figures have been used for the estimations for 1976.

The first step was to identify those sectors of the economy where unregistered activities could *not* be expected, e.g. large companies and public corporations. According to Franz (1985), this resulted in an appreciable reduction in the potential size of the black economy. Whether or not this is a reasonable assumption as regards large companies depends on circumstances in Austria, of course. As far as France is concerned, however, Willard (1992), who also makes this assumption, says that it does not mean that there are no black activities at all in these sectors (see above).

Next, the black economy is divided into two parts, one for the hidden activities of the self-employed, in the form of sales "off the records", and the other for the black activities of wage earners.

The sales "off the records" of the self-employed are partly determined on the basis of their and wage earners' working hours. Basically, the assumption is that, if the self-employed work just as much as wage earners in the same industry with the same skills, then the self-employed will have the same income, otherwise they would change jobs. In other words, the self-employed are assumed to act rationally. Comparing the income of the self-employed with that of wage earners (with the same working hours) shows that the self-employed earn less than wage earners. The difference is attributed to the fact that the self-employed have hidden income. According to Franz (1985), calculations show that the lower the formal income of the self-employed, the higher their hidden income.

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Danish Pig Producers and Slaughterhouses) and Kødbranchens Fællesråd (The Danish Livestock and Meat Board). The price-times-volume calculation of output value in the national accounts is therefore probably not affected by whether products are sold in the formal or informal market.

Furthermore, self-employed persons who have a more direct contact with customers also have higher hidden incomes.

This assumption is not without problems, however. For example, it overlooks the fact that the self-employed can have declared all income truthfully and yet still have a lower income than wage earners (with the same characteristics). For example, it is not inconceivable that the self-employed expect to have an even higher income in the near future, and therefore act rationally anyway. Similarly, it cannot be ruled out that being self-employed is in itself more attractive, inasmuch as it gives more freedom, and that as a result the self-employed are more willing to accept lower “wages”.

The extent of wage earners’ black activities is based on a study of occupational categories. Based on a 2-digit occupational classification, those occupational groups where the possibility for black activities cannot be ruled out in advance have first been identified. These groups are then further examined on a 4-digit level in order to identify the groups which must be assumed to have the possibility for black activities.

The number of possible black jobs is further reduced by means of a time budget study, where respondents are also asked whether they have a second job (though without explicitly asking whether it is black). The frequency of second jobs is then used to reduce the number of possible black jobs (number of possible black jobs x the frequency of second jobs).

By this method, Franz (1985) finds that the black economy in Austria in 1976 constituted approximately 3.8% of GDP. He also thinks that this figure applies for 1991, since, he says, activities in the black economy do not fluctuate much in the short term. Of this, the “off the records” sales of the self-employed constitute 47%, while wage earners’ black activities accounts for the rest. As regards the self-employed, black activities are especially concentrated in restaurants, hotels and cafés, while for wage earners they are especially found in the construction industry (skilled workers) and the transport (drivers) and car repair (mechanics) industries. This should not be surprising, however, since Franz (1985) had already identified those occupational groups in which black activities can be expected.

As can be seen from the above, measuring the black economy on the basis of discrepancies in the national accounts is far from straightforward. The method is particularly sensitive to differences in definition in the many statistical sources used by the national accounts. Moreover, the method cannot identify all black activities. The method is also uncertain where a transaction between two parties

is dated at different times – a problem which is exacerbated when inflation is high.

The discussion of the above method has also shown that there are large differences between the methods used by different countries. The measurement of the black economy thus depends a lot on how the national accounts are estimated and which sources are available to national accounts statisticians. Table 3.2, which shows the extent of the black economy based on national accounts, should therefore be interpreted with extreme care.

Table 3.2: Extent of the black economy based on the national accounts

Country	Year	Extent of the black economy	Remarks	Source
Denmark	1963	11-13% of pers. net income	Estimate based on revised figures for the national accounts	Danish National Council of Economic Advisors (1967, 1977) Stetkær (1983)
	1970	10% of pers. net income		
	1975	6% of pers. net income		
	1975	4% of pers. net income		
W.Germany	1964	16% of GNP		Petersen (1982)
	1974	4.8% of GNP		
Gt. Britain	1978	3.3% of GDP		Macafee (1980)
Sweden	1978	5.4-8.3% of GDP		Hansson (1984) Hansson (1984)
	1981	4.2-7.0% of GDP		
Holland	1991	4.9% of GDP	Includes only tax evasion on interest recieved. Based on a "sensitivity analysis" and not an actual measurement. <sup>1)</sup>	Tengblad (1994) Kazemier (1991) Broesterhuizen (1985)
	1977	1.2% of GNP		
	1981	1.9% of GNP		
	-	max. 5% of GNP		
Italy	1982	18% of GDP		Siesto (1992)
France	1985	3.35-6.75% of GDP		Willard (1992)
Austria	1976	3.8% of GDP		Franz (1985)
	1981	3.8% of GDP		

Note: See text for a more detailed description of the various calculations.

<sup>1)</sup> Therefore no data is given.

Except for Italy, it appears that, measured on the basis of differences in the national accounts, the black economy accounted for 3-5% of GDP in the 1970s and 1980s, depending on the country concerned and the method used. This also applies to Denmark, cf. the Danish National Council of Economic Advisors (1977) and Stetkær (1983), and also agrees with the figure for the Danish black economy measured using the questionnaire method (cf. Viby Mogensen et al. (1995) and chapter 5 below) if allowance is made for differences in valuing black activities. As regards Italy, the figure for the black economy is very high using this method – a huge 18% of GDP.

Barthelemy (1988) is especially scathing about national accounts statisticians' measurement of the black economy. According to Barthelemy (1988), these low

figures<sup>5</sup> are more a reflection of the statisticians' attempt to legitimise their figure for official GDP than a measure of the actual size of the black economy. Barthelemy backs up his argument by referring to the above-mentioned studies by Macafee (1980), Broesterhuizen (1985) and Blades (1982). However, he overlooks the not unreasonable argumentation of, among others, national accounts statisticians that there must be parts of the economy, e.g. the public sector, that are not affected by black activities or tax evasion. Barthelemy (1988) also overlooks the fact that the price-times-volume calculations, which are used in the national accounts for, for example, agriculture, enable statisticians to identify any black activities in this industry.

Finally, it can be mentioned that the EU is currently making heroic efforts to determine the accuracy of member countries' national accounts. This also includes determining the extent to which they include activities in the black economy. This will not be discussed further here. Statistics Denmark's GNP expert, Esben Dalgaard, goes into this more thoroughly in chapter 4 below.

### **3.4.3 Differences between official participation rates and actual participation rates**

This method measures the shadow economy by looking at the difference between the participation rate measured by the official statistics and that measured in other, independent studies. This method has especially been used by Italian researchers, cf. Frey & Pommerehne (1982, 1984) and Pyle (1989).

The method was developed after observations showed that participation rates were significantly lower in Italy in the 1970s than in other western countries, e.g. the USA and France.<sup>6</sup> According to Contini (1981, 1982), the official participation rate in Italy in 1959 was 44%, which was about the same as the other countries at that time. A study carried out by ISTAT in 1971, however, showed a participation rate of 42%, while the official participation rate was only 36.2%. Another study in 1977 (also carried out by ISTAT) showed that the participation rate was 41.4%, against an official rate of 33.7%. The difference between the two figures is assumed to be attributable to the shadow economy.

Contini (1981, 1982) further assumes that the official participation rate in 1959 is correct, and that the participation rates from the two studies in 1971 and 1977 are also correct. In order to obtain the "correct" participation rates in the intervening years, Contini (1981, 1982) interpolates between the results for 1959 and

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<sup>5</sup> He does not mention the figure for Italy.

<sup>6</sup> According to Frey & Pommerehne (1982), which is based on official OECD statistics, the participation rate in Italy in 1975 was 35.5%, against 42.3%, 42.7% and 44.4% respectively in France, W. Germany and the USA – see also Pyle (1989).

the two independent studies in 1971 and 1977. He finds that, in 1977, over 17% of the working population in Italy were employed in the shadow economy. Furthermore, according to Contini, this is only a conservative estimate, inasmuch as persons with more than one job (in both the formal and shadow economies) are excluded, as are those persons already employed in the shadow economy in the base year in 1959. The aforementioned 17% corresponds to between 14% and 20% of GNP, depending on the assumptions made in converting to GNP.

However, as pointed out by Pyle (1989), it is not quite clear how Contini converts the 17% of the working population in the shadow economy to an estimate of the shadow economy in terms of GNP. It is clear, however, that Contini must implicitly assume that productivity is the same in both the formal and shadow economies. Pyle (1989) also criticises Contini's results, since Contini does not publish figures for his interpolations. Contini admits himself, however, that the figures fluctuate somewhat after 1972.

Notwithstanding Pyle's reservations, he finds the method interesting, especially if the interviewers in the independent studies are able to obtain valid data about *all* types of employment, i.e. including employment in the shadow economy.

#### **3.4.4 Monetary methods**

The monetary methods are based on the presumption that actors in the shadow economy only want to be paid in cash, since there is a possibility, however remote, that the authorities can trace transactions which have been paid for by cheque or credit card. If transactions in the shadow economy are paid for in cash, one way of determining the size of the shadow economy would be to compare people's actual demand for cash with the demand that could be expected if there were no shadow economy.

##### **Gutmann's (1977) method**

Monetary measurements of the shadow economy achieved a breakthrough with Peter M. Gutmann's article in 1977, which will therefore be discussed briefly here, also because the principles involved partly apply to the other monetary methods.

Gutmann's method is based on four assumptions. First, it is assumed that all activities in the shadow economy are paid for solely in cash, since these transactions cannot be traced. Second, it is assumed that, in a given base period (in Gutmann's article 1937-41), there were no activities in the shadow economy. Third, that the income velocity of circulation is the same in the shadow economy as in the formal economy. Last, it is assumed that, in the absence of a shadow economy in the final year of the study (1976 in Gutmann's study), the

relation between the value of notes and coins in circulation (cash) and the value of demand deposits in banks is the same as in the base period.

Gutmann now compares the relation between the value of cash and the value of demand deposits in the base period (1937-41) and in 1976. This shows a ratio of 0.344 in 1976, against only 0.217 in the base period. If there had been no shadow economy in 1976, this ratio would have been the same as in the base period (see assumption 4 above). The increase in circulation of cash is thus assumed to have been used to finance activities in the shadow economy. Using the assumption that the income velocity of circulation in the shadow economy and formal economy is the same, Gutmann can now estimate the extent of activities in the shadow economy. By this means, he finds that, in 1976, the shadow economy in the USA constituted about 10% of GDP.

Gutmann's method has since been strongly criticised, especially as regards his final assumption that the relation between the value of cash and demand deposits in banks is solely influenced by activities in the shadow economy. Over a period of 35 years, other factors, such as the trend in interest rates and inflation, can also be expected to influence the demand for cash. As Gutmann also points out himself, the more mature an economy, the more transactions are likely to be carried out by cheque. This will result in a bigger increase in bank balances, and with it a fall in the relation between the value of cash and demand deposits, without there being any change in the size of the shadow economy. Gutmann further points out that this ratio was 0.352 in 1892, against the aforementioned 0.217 in 1937-41. The increase in the use of other payment methods in recent years, e.g. credit cards, must have exacerbated this problem with the method.

The way in which wages are paid also influences the relation between cash and demand deposits. In Denmark, wages were paid in cash up to the beginning of the 1970s, after which it was paid via banks, which reduced the demand for cash (see, among others, Danmarks Nationalbank (The Danish Central Bank) (1996)). Danmarks Nationalbank (The Danish Central Bank) (1996) also points out that the transition to the pay-as-you-earn system of income tax meant that a large part of tax payments were in the form of electronic transfer by employers.

Gutmann uses the so-called money aggregate, M1, as a measure for demand deposits. M1 is defined as households' accounts in the central bank and banks in the form of notes, coins and deposits in postal giro and demand accounts. If money is now transferred from a demand deposit to, for example, a 3-month time deposit, the relation between the value of cash and demand deposits will rise without there having to be any corresponding increase in black activities. Frey & Pommerehne (1984) have shown that Gutmann's method is particularly sensitive to the selection of the base year for the calculations. If Gutmann had

instead chosen the period 1925-29 as the base period, the shadow economy would have been approximately 16% of GDP in 1976, though the ratio between cash and demand deposits, which in 1937-41 was 0.217 (see above), would only have changed by about 0.06.

The problems with the assumption about the relation between cash and demand deposits led to the development of more refined monetary methods for determining the size of the shadow economy, methods which were not so sensitive to, for example, changes in the way wages were paid or the trend in interest rates and inflation (see next section). The other assumptions, which also figure in the other monetary methods, will be discussed and evaluated later.

### **Tanzi's (1980) method**

The next step in the development of the monetary methods was an article by Tanzi in 1980, later reprinted in Tanzi (1982). Tanzi's method represents a further refinement of Gutmann's (1977) measurement method<sup>7</sup>, though it builds on three of the same assumptions, Tanzi also assuming that only cash is used in the shadow economy. It is also assumed that the size of the shadow economy can be set at 0 in a given base year (1929 for Tanzi (1980)). Finally, it is assumed that the income velocity of circulation is the same in the shadow economy as in the formal economy. In addition to this, Tanzi assumes that the growth in the tax burden is the sole reason behind activities in the shadow economy.

The method consists in estimating a function (by means of linear regression) based on time series data (for the period 1929-76) for the demand for cash, which is defined as notes and coins in circulation. By means of this function, Tanzi hopes to control for possible factors which tend to determine the demand for cash, e.g. interest rates, economic activity in general, changes in the way wages and taxes are paid, etc. It is precisely the inclusion of these explanatory variables that makes Tanzi's method more reliable and interesting than Gutmann's. The function also includes a variable which is especially assumed to be extremely important for the growth of the shadow economy, namely the tax burden. The tax variable thus measures that part of the demand for cash which cannot be explained by the growth in formal economic activities.

Tanzi (1980) uses the relation between notes and coins in circulation and the so-called secondary money aggregate, M2, as dependent variables in his regression equation, thereby avoiding the problem of a change from one account type to another being attributed to an increase or decrease in the shadow economy, as was the case with Gutmann's method. Based on the regression equation, a value

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<sup>7</sup> Tanzi's (1980) method is inspired by Cagan (1958), cf. Tanzi (1980).

for the demand for cash can be calculated. This value can then be compared with the actual demand for cash.

The model turns out to be quite good at predicting the demand for cash compared with actual demand. Tanzi then determines the demand for cash based on two assumptions – a “hypothetical” demand for cash assuming zero taxation, and a “hypothetical” demand for cash assuming that taxation is set at the lowest value throughout the period in question (1929-76). The difference between the “hypothetically” determined demand for cash (based on the two above assumptions) and the demand for cash predicted by the model is then assumed to be the volume of cash used in the shadow economy.

As can be seen from the above, the growth in and extent of the shadow economy is determined solely by the tax variable. The growth in the shadow economy is determined in the situation where the tax variable has the lowest value in the period, while the extent is determined where the tax variable is set at 0. In order to calculate the growth in and extent of the shadow economy using this method, the tax variable must be positive in the regression analysis. Once Tanzi has found the volume of cash used to finance black activities, he can then calculate the growth in and extent of the shadow economy by multiplying the estimated volume of cash in the shadow economy by the income velocity of circulation in the formal economy. This calculation presupposes that the income velocity of circulation is the same in the shadow economy as in the formal economy (see above).

By this means, Tanzi obtains a figure for the extent of the shadow economy of between 8.1% and 11.7% of GDP in the USA in 1976 (with the tax variable set at 0). He calculates the change in the shadow economy resulting from rising taxation, i.e. the tax variable is set at the lowest level for the whole period, at between 3.4% and 5.1% of GDP.<sup>8</sup>

Klovland (1980, 1983, 1984) has used a slightly different version of Tanzi’s method to measure the shadow economy in Norway and Sweden. Thus, Klovland relates the volume of cash to the price level and not M2, as in Tanzi’s study. Klovland’s method also differs in including changes in both the dependent variable and the explanatory variables, and by including the value of the dependent variable, lagged by one or more periods, as the explanatory variable. Basically, this is the same method, however, since Klovland’s model depends on precisely the same assumptions as Tanzi’s. Klovland (1984) finds that the tax

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<sup>8</sup> Using the so-called transaction method, Fiege (1979) finds that the shadow economy was 22% of GDP in the USA in 1976. This method is not widely used, however, and will therefore not be discussed further here. For a more thorough discussion, see, for example, Feige (1979), Frey & Pommerehne (1984) or Pyle (1989).

variable for Norway is negative, which causes the method break down. It is therefore not possible to determine the size of the shadow economy for Norway. For Sweden, Klovland finds that the shadow economy constitutes between 3% ad 20% of GDP in 1982, depending on the measure for the income income velocity of circulation used.

According to Schneider (1997), since the publication of Tanzi's (1980) and later Klovland's (1980, 1983, 1984) methods and results, estimates have been made for 14 out of 17 OECD countries using this method (albeit with varying model specifications).<sup>9</sup>

However, even though the method has become widely used, it is flawed by several not inconsiderable problems.

One such problem is the assumption that transactions in the shadow economy are solely cash transactions. In Norway, Isachsen & Strøm's (1981) results for 1980 showed that fully 20% of activities in the shadow economy were non-cash transactions. And a more recent study by Tufte (1994) shows that 23% of black activities in Norway are not paid for in cash. The latest Danish data puts this figure at 35% - 57% for Denmark, cf. Viby Mogensen et al. (1995). Cash is not the only form of payment that is hard to trace – trying to trace black activities paid by cheque would require enormous resources, which is why cheques have become a close substitute for cash. Thus, the monetary methods do not measure black activities where payment is by cheque or a form of payment in kind.

The assumption of the absence of a shadow economy in a given base year is also unrealistic. This base year is selected more on the basis of how far back in time it is possible to obtain data than on which year or period there is unlikely to have been a shadow economy. This is clearly illustrated by the following quote from Tanzi (1982, p.75): *“The statistical analysis covers the period 1929-76, the longest time for which the needed data are available for the United States at this time.”*

The assumption that the size of the shadow economy is only influenced by the level of taxation is also questionable. As pointed out in the theoretical literature, e.g. Cowell (1990), the risk of detection probably also plays a part in the incidence of black activities or tax evasion, as does the size of fines and prevailing tax ethics. None of these variables are included in the model as explanatory variables. As mentioned above, however, Schneider (1997) has introduced

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<sup>9</sup> As something new in this type of model, Schneider (1997) has expanded the number of explanatory variables to also include the complexity of the tax system and the degree of public regulation, the theory being that the more complex the tax system, and the more laws that are passed, the greater the probability of black activities.

measures for the complexity of the tax system and the degree of public regulation in his model of the shadow economy in Austria.<sup>10</sup> Schneider (1997) finds that, in Austria, increasing public regulation and an increasingly complex tax system has resulted in an expansion of the shadow economy.

It is also debatable whether the income velocity of circulation in the shadow economy and the formal economy, as assumed in the estimations, is actually the same. As pointed out by Cagan (1958), it can be argued that the income velocity of circulation is lower in the shadow economy, since money earned here is perhaps more likely to be saved. Conversely, Feige (1979) argues that the income velocity of circulation is higher in the shadow economy, since, he says, economic activities here are typically services. Services are provided directly to the customer and are paid for directly to the provider. Obviously, it is impossible to say which is correct, since there are no measures for the income velocity of circulation in the shadow economy. There is therefore much to recommend accepting the assumptions, cf. also Schneider (1997) and Pyle (1989). In support of the assumptions, Viby Mogensen (1990b), based on Danish questionnaire data, has shown that, for 1988/89, money earned in the shadow economy is just used in daily consumption, along with income from the formal sector.

Finally, the increasing use of cheques, postal giro and credit cards should also be included in the estimations of the demand for cash. In Denmark, for example, the value of payments using Dankort (a type of credit card) was more than 15 times higher in 1995 than in 1987, and, according to Danmarks Nationalbank (The Danish Central Bank) (1996), amounted to over DKK 80 bn. Schneider (1997) is the exception here, since he includes the number of Eurocheques cards in Austria as an approximation for the value of amounts withdrawn using Eurocheques and Eurocheque cards. His results show that an increasing number of Eurocheque cards leads to a falling demand for cash.

A last, and special, problem for monetary estimates in countries such as the USA and Germany is that these countries' currencies also function as parallel currencies in other countries with high inflation. It has been estimated that up to 2/3 of all dollars issued circulate outside the USA, the corresponding figure for DEM being approximately 40%, cf. Danmarks Nationalbank (The Danish Central Bank) (1996).

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<sup>10</sup> The inclusion of these variables has probably been inspired by Frey & Weck-Hanneman (1984), cf. the so-called model approach described later in this chapter.

### Main results based on the monetary method

The monetary method has been used by Freidrich Schneider and Jens Lundager (cf. Schneider (1985, 1986) and Schneider & Lundager (1986)) to determine the extent of the shadow economy in Denmark. In Schneider (1985), the shadow economy was estimated at between 7% and 13% of GDP, while the figure in Schneider (1986) was 7% - 10% of GDP in the period 1978-82. The difference is due to different model specifications and different definitions of tax variables.

Pedersen (1991) tried to reproduce Schneider's results and update them to 1988.<sup>11</sup> It was not possible to use the same data, however, which meant trying to recreate them from the very detailed definitions of the variables in Schneider (1985, pp. 39-46). The attempt failed, however, because it resulted in the main tax variable being negative, which caused the method to break down.

It is obviously disconcerting that an attempt to reproduce Schneider's results should lead to such a different result. This is probably partly due to the fact that Pedersen (1991) was unable to recreate all of Schneider's data. Using a slightly different model specification, Pedersen (1991) and Viby Mogensen et al. (1995) obtain a figure for the shadow economy of just under 3% of GDP in 1982, compared with Schneider's (1985) over 12% of GDP using the same definition of the tax variable. There is therefore a considerable difference between the two estimates.

One of the differences in the models is that Pedersen (1991) omits the dependent variable lagged by one (or more) periods as the explanatory variable, whereas Schneider (1985, 1986) includes the dependent variable lagged by two years as the explanatory variable. As pointed out by Pyle (1989), the population is unlikely to need as much as two years to adjust their need for cash.

Schneider & Lundager (1986) have also estimated the shadow economy in Sweden and Norway using this method. The results for Norway show that the tax variable explains a significant part of the demand for cash. This is the exact opposite of Klovland's (1984) result (see above). Schneider & Lundager (1986) even use the same data<sup>12</sup> as Klovland (1984), albeit with a slightly different model specification. As Pyle (1989) concludes, the fact that such relatively small differences in the models can lead to such different results is problematical. In Pyle's (1989, p. 41) own words: "*Differences so easily generated must cast some suspicions upon the reliability of the estimates*".

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<sup>11</sup> In Viby Mogensen et al. (1995), Pedersen (1991) results are updated up to and including 1990.

<sup>12</sup> Cf. endnote 10 in Schneider & Lundager (1986, pp. 30-31).

Tanzi (1983) updates his original estimates up to and including 1980, i.e. by four more years. He now estimates the extent of the shadow economy in the USA in 1976 to be between 3.6% and 5% of GDP, less than half his original estimate of between 8.1% and 11.7%. As Pyle (1989) comments, the fact that the addition of data for just four more years can make such a big difference to the result is problematical. As Pyle (1989) also says, however, it could be due to the instability of Tanzi's estimated coefficients.

Schneider (1997) has collected the above-mentioned estimates for 14 OECD countries using this method, reproduced here in table 3.3, which also includes Schneider's (1997) latest results for Austria and the Danish results, cf. Viby Mogensen et al. (1995).

Table 3.3: The shadow economy in various OECD countries, estimated using monetary methods

Country	Source	The shadow economy as a percentage of GDP	
		1980	1990
Belgium	Hove & Vuchelen (1994)	16.4	19.6
Canada	Karoleff, Mirus & Smith (1993)	10.1-11.2	-
Denmark	Schneider (1986)	6.9-10.2	9.0-13.4 <sup>1)</sup>
	Viby Mogensen et al. (1995)	2.7	1.8
Germany	Kirchgässner (1984)	10.3-11.4	11.4-13.1 <sup>1)</sup>
France	Barthelemy (1989)	6.9	9.4 <sup>1)</sup>
Ireland	Boyle (1982)	8.0	11.7 <sup>1)</sup>
Italy	Contini (1989)	16.7	23.4 <sup>1)</sup>
Holland	Broesterhuizen (1989)	9.1	13.9 <sup>1)</sup>
Norway	Lundager & Schneider (1986)	10.2-10.9	14.5-16.0 <sup>1)</sup>
Spain	Lafuente (1980)	18.0 <sup>2)</sup>	21.0 <sup>1)</sup>
Sweden	Lundager & Schneider (1986)	11.9-12.4	15.8-16.7 <sup>1)</sup>
	Klovland (1984)	3-20	-
Switzerland	Weck-Hanneman, Pommerehne & Frey (1986)	6.5	6.9 <sup>1)</sup>
Gt. Britain	Matthews & Rastogi (1985)	-	14.3 <sup>1)</sup>
USA	Tanzi (1983)	3.9-6.1	5.1-8.6 <sup>1)</sup>
Austria	Hofreither & Schneider (1987)	5.0	7.2
	Schneider (1997)	3.05	5.14

Note: 1) The figures for 1990 are estimated by Schneider himself. For countries where Schneider has not estimated the figures himself, he has either obtained data from the authors concerned or asked them to update their figures (E-mail to the author from Schneider, 10/7-97).

Figures for Denmark (Viby Mogensen et al., 1995) and Sweden (Klovland, 1984) have been added to Schneider's original table.

2) Concerns 1978.

Source: Schneider (1997), Viby Mogensen et al. (1995) and Klovland (1984)

As can be seen from the table, the shadow economy has grown in nearly all countries in the period 1980-95. Schneider (1997) divides the countries into three groups, with Italy, Spain, Belgium and Sweden in the group with the biggest shadow economy – 23.4%, 21.0%, 19.6% and 16.7% of GDP respectively. The middle group, with a shadow economy of between 12% - 15% of GDP,

consists of Norway, Britain, Holland, Canada, Denmark, Germany and Ireland. In the group with the smallest shadow economy – between 7% - 9% of GDP – are France, the USA, Austria and Switzerland. Schneider (1997) has not taken account of either Viby Mogensen et al.'s (1995) or Klovland's (1984) results for Denmark and Sweden respectively in this classification.

A comparison of these results with, for example, the estimates based on differences in the national accounts or the direct questionnaire surveys in chapter 5 and 6 shows that, in general, the monetary methods give a much higher level for the shadow economy. As the above account also shows, however, there are not inconsiderable problems with this method, and the results are highly uncertain.

### **3.4.5 The so-called model approach**

The so-called model approach has been used for most OECD countries. The main contribution, an article in which the extent of the shadow economy is determined in 17 OECD countries, is published in Frey & Weck-Hanneman (1984). Later, Aigner et al. (1988) have used the method with figures for the USA. The gist of the method is that the shadow economy is an unobserved variable which is influenced by various factors, and which can be measured via various indicators. The advantage of the model approach compared with, for example, monetary methods, is that it allows more factors than just the tax variable (as, for example, in Tanzi). Another advantage is that there are other indicators than, for example, just the growth of notes and cash in circulation.

According to Frey & Weck-Hanneman (1984), the shadow economy can be explained by four factors. Firstly, taxation and jungle of laws and regulations imposed by the State. Thus, argue the two authors, an increase in taxation and regulations will lead to an increase in the shadow economy. Secondly, people's tax ethics, where it is assumed that declining tax ethics will result in an increase in the shadow economy. The third factor is the level of economic development (as measured by real disposable income per capita), and, lastly, unemployment. According to Frey & Weck-Hanneman, it is impossible to predict in advance how unemployment and economic development influence the extent of the shadow economy.

Three variables are used as indicators for the shadow economy: The growth in real GDP, the participation rate for men, and the number of working hours. All three indicators are assumed to have an inverse correlation with the shadow economy. Only men's participation rate is used, since, according to the authors, women's participation rate is due to other factors than activities in the shadow economy.

Based on the data for the causal and indicator variables, a special statistical model is constructed which can be used to determine the growth in the shadow economy. A major drawback of the method is the difficulty in obtaining reliable data for the factors, e.g. the degree of public regulation, which Frey & Weck-Hanneman approximate by looking at the proportion of public employees in relation to total employment. As pointed out by Pyle (1989), however, not all public employment necessarily leads to regulation. For example, it is hard to see how nursing staff in old people's homes and hospitals are supposed to lead to an increased regulation of the population.

Obtaining reliable data for changes in tax ethics is even more difficult. For countries where such data is not available, the median for tax ethics for the Scandinavian countries, Britain and the German-speaking countries is used. Pyle (1989, p. 80) is particularly critical about this approach, since he feels that the construction of a variable for tax ethics for countries where such a variable does not exist is highly suspect. And there is no denying the absurdity of using another country's figures for tax ethics.

Based on the estimation of an advanced statistical model, Frey & Weck-Hanneman find that the tax burden, degree of public regulation and tax ethics are significant causes of the shadow economy. By means of this equation, the authors can determine the relative size of the shadow economies of the 17 OECD countries, where Sweden has the biggest, followed by Belgium and Denmark respectively, while Japan, according to this method, brings up the rear with the smallest shadow economy.

To determine the extent of the shadow economy in the various OECD countries requires, as a starting point, a figure for the shadow economy in one of them, only measured using another method. Frey & Weck-Hanneman use figures for Norway and Sweden for 1978, which Klovland (1980) estimated using a monetary method (see section 3.4.4 above), as their basis. But, as Pyle (1989) notes, this approach suffers from the drawback that, in 1984, Klovland's tax variable for Norway was negative, which caused the method to break down (see also section 3.4.4 above). Thus, the figures for Norway are extremely uncertain, and this uncertainty obviously affects Frey & Weck-Hanneman's estimates.

Frey & Weck-Hanneman estimate the extent of the shadow economy in Denmark to be 11.8% of GDP, followed by Italy with 11.4%. The results for Holland, Norway (which are Klovland's figures for 1980), W. Germany and Spain are 9.6%, 9.2%, 8.6% and 6.5% of GDP respectively.

Due to the considerable problems of obtaining reliable data for the causal variables, the method cannot be regarded as giving a true picture of the extent of the

shadow economy, so it is not discussed further here. Pyle (1989) also finds that data reliability is the most serious drawback of the method, which Frey & Weck-Hanneman (1984, p. 47) themselves point out (see also Schneider, 1997, note 3).

### **3.5 Closing remarks**

Over the years, many different methods have been developed to measure the extent of the shadow economy. These differ both in their approach to the problem and in the assumptions they are based on. There are also big differences in how widely they are used and which years they measure.

It is therefore extremely difficult to compare the shadow economy in different countries. Even within the same country, it is far from easy to compare the extent of the shadow economy measured using different methods. What is more surprising is that there can be big differences in the figures even using the same method.

Differences in the national accounts gives a figure for the shadow economy of between 2% and 5% in most of the countries where this method has been used. Italy is the big exception here, however, where it constitutes not less than 18% of GDP. Using this method, the level of the shadow economy is no higher in Denmark than in the other European countries. Moreover, the differences that can be observed should be interpreted with great caution, since there are big differences in the way GDP is measured in the national accounts from country to country (based on different data).

The shadow economy is much bigger measured by means of monetary methods. This generally applies to all countries. Thus, a figure for the size of the shadow economy of 10-15% of GDP is not unusual using these methods. Again, there is not much difference in the extent of the shadow economy in Denmark compared with other European countries using these methods. Denmark seems to lie in the middle, together with Norway, Holland, Germany, Gt. Britain and Ireland.

However, the monetary methods in particular are based on heroic assumptions. And the results obtained using these methods are extremely sensitive to model specifications and data quality. For example, the size of the shadow economy in Denmark swings between just under 2% and 9-13% of GDP in 1990 measured by one of the monetary methods. Furthermore, for other countries (and also for Denmark), it is not unusual for the main variable (taxation) to be negative in the model estimations, which causes the model to break down. That the monetary methods are nevertheless widely used is probably due to the fact that the data required for the estimations are relatively easy to obtain from the available statistics. They also allow estimates to be made for longer periods.

## **4. The black economy in EU countries**

By Esben Dalgaard, Chief Economist (GNP) at Statistics Denmark

The aim of this chapter is to explain the definition of the black economy in the national accounts, and especially the role of the EU in this. It also presents an overview of relevant methods for quantifying the black economy, together with estimates of the size of the black economy in EU countries. The chapter ends with some observations on ongoing efforts to include the black economy in the national accounts.

### **4.1 Definition of the black economy in the national accounts**

What is usually meant by the black economy, at least as far as the national accounts are concerned, is the value added of production which ought to be included in GDP, but which is especially difficult to measure because the underlying transactions are hidden. Implicit in this definition is that activities are only included in the black economy if they fall inside the production boundary of the national accounts.

For the exchange of activities and payments to be considered productive in the national accounts, the transactions involved must be voluntary and benefit both buyer and seller. This definition precludes, for example, “protection money”, ransom money and theft from being included in the black economy, inasmuch as these are not productive activities, but the seizure, by means of force, of the assets of one economic unit by another economic unit. Such activities are not transactions which create primary income.

Tax evasion as regards, for example, interest and dividends is not part of the black economy in the above sense either, since these are transactions which have to do with the distribution, not the creation, of income. On the other hand, as far as the national accounts are concerned, it is irrelevant whether productive activities in themselves are legal or illegal. Doubly illegal black activities are characterised by the fact that they would be illegal even if the income derived from them was declared to the tax authorities. For example, drug dealing and prostitution are productive activities in a national accounting sense, and in principle the incomes from such activities are a part of the black economy.

In practice, however, in their national accounts, almost all countries have chosen to limit that part of the black economy they want to include in GDP to productive transactions which in themselves are legal, and where the black aspect is solely due to tax evasion. As yet, no EU country has attempted to include the value added of, for example, drug dealing, in GDP.

Within the black economy as defined above, it is useful to distinguish between two main situations:

- (1) A firm which carries out black production is registered with the authorities, but conceals part of its activities.
- (2) A firm which carries out black production conceals its activities from the authorities, neither disclosing its turnover or employment to these.

The former is an example of under-declaration, where part of sales is concealed and/or costs over-reported. Part of this non-declared turnover might then be paid as black wages to employees who in turn do not declare their wage income. One example of this is a restaurant which is registered with the tax authorities, but which conceals part of its turnover and employs black labour, who are paid in cash from the “profits” that skirt the cash register.

In the second case, there are two possibilities. This could be a hidden firm with many employees, where all turnover and wages evade tax. A typical example is a “sweatshop”, where illegal immigrants make clothes ordered by clothing wholesalers. However, since this normally requires a combination of illegal immigrants and the large-scale falsifying of invoices, inasmuch as the wholesaler must still be able to deduct his purchases, it is hardly likely to be common in Denmark. It is thought to occur on a large scale in some EU countries, however.

The second possibility is that it is a one-man firm, which only employs the owner, and where all income is black profit. An example of this is a journeyman painter who, in addition to his normal “white” job with a master painter also is engaged in black activities in his spare time. When carrying out black activities, this journeyman painter is not employed by anyone, but, as far as the black economy is concerned, is self-employed.

The term “black activities” is often used rather loosely in the public debate to cover everything from narrowly defined black wage income to all the types of income mentioned above – and sometimes more. From a national accounting point of view, it is useful to distinguish between, on the one hand, business profits deriving from under-declaration in firms with several employees, and, on the other, black wages to employees and business profits in black one-man firms. Only the latter concerns “black activities” in the sense of payment for a specific amount of work. The other black incomes deriving from under-declaration are not narrowly related to a specific amount of work, but are part of ordinary tax evasion.

The distinction between black activities and under-declaration in registered firms is particularly important when attempting to measure the black economy in a national accounting sense. As the example of the restaurant with under-declaration and black activities shows, under-declaration and black activities often go hand in hand. In order to avoid double counting, it is therefore important to realise that black wages are often paid from hidden turnover. Thus, you cannot estimate the total black economy merely by adding up estimated black wages and estimated tax evasion for the self-employed and companies. This requires an estimate of how much of concealed turnover is paid as black wages and how much ends up as black profits in the owner's pockets.

#### **4.2 The black economy in the national accounts**

In principle, GDP, which is the value of a country's total production, should include all black activities in the sense mentioned above. Within the EU, the level of member countries' GDP, and with it the question of whether official estimates of GDP are sufficiently accurate and, in particular, able to capture the black economy, has attracted considerable and increasing interest since 1988. This is due to the fact that, from this year, a large and increasing proportion of member countries' contributions to EU coffers has been based on GNP, which is equivalent to GDP plus wages and net investment incomes from foreign nations. At a Council of Europe meeting in connection with the passing of the GNP directive in 1989, the European Commission and member states were exhorted to intensify efforts to include the black ("parallel") sector in the national accounts, and thus also in member countries' GNP. The Commission and member countries have been working on this problem within the framework of the GNP Management Committee since 1990. The work so far has consisted of 4 phases:

- Methodological studies of 7 different methods of quantifying the black economy.
- An overview of what is currently included in EU members' GNP.
- The adoption of an action plan based on 3 different models.
- A follow-up of the action plan, with a 1/10-98 deadline for including anything missing.

As far as the EU is concerned, therefore, the aim is not to estimate the size of the black economy as such, but solely to ensure that the official GDP figures include all productive economic activity, whether black or white. In most countries, an appreciable number of the estimates of black activities are implicit, or indirect. A good example are cases where production is estimated as price times volume, as opposed to being based on net turnover figures in the accounts. This is the case for agricultural production in all EU countries, for example. If the estimates of produced volumes of crop and livestock products are accurate, any non-declared production value will be automatically included in the estimate of

GDP. However, it is normally not possible to determine precisely how big the figure for black activities in agriculture is. At best it can be estimated by comparing, for example, VAT statistics and national accounts figures.

The same applies where value of output is estimated from the expenditure side. Since buyers do not have the same motivation as sellers to withhold information about transactions from the tax authorities, it can be presumed – and there is some empirical evidence to show – that estimates from the expenditure side, e.g. in consumer surveys, will include some black activities. Precisely how much is naturally difficult to determine directly. In contrast to this, there are explicit corrections for black activities and under-declaration which can, for example, be based on the results of tax control campaigns.

The EU's overview of the present proportion of black activities in member countries' national accounts show that most countries use a combination of implicit and explicit corrections, albeit with a slight preponderance of the former. Only France, like the USA, makes systematic corrections for under-declaration in all relevant industries outside agriculture. These are mainly based on the results of past tax control campaigns. Most EU countries make implicit or explicit corrections in industries which can be presumed to have an especially high incidence of black activities. Only two countries, France and Italy, make corrections in all industries, except those sectors where black activities can more or less be ruled out, e.g. primarily the general government, financial institutions, and industries where almost all production takes place in publicly owned companies, e.g. utilities. The methods used in France and Italy have to a large extent been adopted elsewhere, and thus deserve further mention.

#### **4.3 Methods for quantifying the black economy**

The French national accounts attempt to determine the size of the black economy partly by correcting for under-declaration in registered firms and partly by means of a correction for black activities in non-registered units where all activity is hidden. The correction for under-declaration constituted 2.3% of GDP in 1985, while that for black activities amounted to 0.8%, plus an additional 0.25% for tips and non-declared fringe benefits. Two industries, construction and personal services, each account for a third of the correction for black activities. The total explicit correction for the black economy thus constituted 3.35% of GDP. To this must be added an unspecified implicit correction in agriculture by virtue of the price-times-volume estimation of agricultural production. Apart from this, value added is revised upwards by 2.7% in firms that have not filed tax returns and accounts. Finally, a correction of 0.7% is made for levied but not paid VAT, which is to a large extent related to under-declaration. This correction covers, among other things, VAT on transactions that bypass the cash register which businessmen collect from customers but do not send in to the tax authorities,

though a large part must obviously be attributed to bankruptcies. The total upward adjustment for hidden economy and irregularities in financial reporting thus amounts to 6.75%.

It should be noted that, as a rule, the shortfall in tax receipts due to bankruptcies, etc., is legal and thus not black activities in a narrow sense. The adjustments are very stable over the years, but can vary somewhat since they are industry- and sector-specific. As mentioned above, the corrections for under-declaration are based on tax control campaigns and are stratified according to industry, form of ownership and size. The relatively modest adjustment at the global level conceals considerable upward adjustments in such industries as retailing and the hotel and catering trade. As previously mentioned, a similar method is used in the USA. The adjustment for black activities is much more of an estimation, based first and foremost on the share of turnover for small firms in the various sectors. The correction only attempts to identify hidden turnover in units which are completely hidden from the authorities, such as tradesmen's black sidelines. Black wages in registered units is already covered by the correction for under-declaration.

In order to use tax control results as a basis for estimating total under-declaration when extrapolating to the whole economy, two conditions must be met. First, the controlled units must be representative for the whole population, and second, the tax control must be able to reveal the full extent of under-declaration. The first condition is very rarely fulfilled, since, typically for reasons of effectiveness, tax authorities will invariably choose to control those units whose accounts are atypical, and which they can therefore reasonably presume that control will result in extra tax revenue. However, there is much to recommend a certain element of randomness in the selection, since it would have a preventive effect on firms whose accounts appear more plausible at first sight, but where under-declaration can obviously still occur. As regards the second condition, it is naturally difficult to judge how big a part of under-declaration the authorities are able to uncover. The results so far must be regarded as a minimum estimate.

In France, tax control campaigns are based not on random selection, but on the over-representation of units specially chosen for control, based, for example, on previous control results and atypical accounts. Notwithstanding, the French national accounts statisticians have chosen to extrapolate the results to the whole economy. The reason they give is that, when the results of 5 years' control are collected and stratified by industry, form of ownership and size, they are likely to be fairly representative. Furthermore, they argue, any over-evaluation due to lack of randomness in selection will tend to be offset by an under-

evaluation due to the failure of the tax authorities to uncover the full extent of under-declaration.

In Italy, a combination of three methods is used to ensure that the black economy is included in the national accounts: (1) comparing demographic employment data with registered employment in firms; (2) the upward adjustment of the “wages” of the shadow economy; and (3) the estimation of certain expenditures for restaurants, etc., from the expenditure side.

In situations where black activities do not primarily involve a second job, but where large numbers of the employed are engaged in black activities on a full-time basis, the “demographic check” has proved to be extremely effective at exposing holes in the statistical coverage of production. The method consists simply in comparing demographic employment figures from censuses and labour force surveys with the employment figures in company-based statistics. Where the extent of employment in the demographic sources greatly exceeds the number of employees firms themselves disclose in economic censuses, it is a clear indication of large-scale black activities. In Italy, the excess employment is first distributed by industry and company size using information from several different sources. The observed value added per person in full-time employment from accounting statistics is then extrapolated to total employment, stratified by industry and company size. The Italian economy is characterised by an unusually large number of small firms.

Since black activities flourish most in small firms, the special structure of industry in Italy in itself largely explains the size of the black economy here. The aim of extrapolating to the figure for demographic employment is to capture all the production and value added corresponding to the undetected employment in the economic censuses. In the base year, employment in the economic surveys includes all registered firms plus other firms found by field interviewers.

On the face of it, it can seem surprising that demographic sources are able to uncover such large-scale black employment. After all, why should people who go to such lengths to conceal their activity from the tax authorities be so willing to disclose information to statisticians in connection with censuses and labour force surveys? It probably has a lot to do with the fact that, in Italy, both as regards censuses and labour force surveys, respondents are confronted by interviewers who can be presumed to have considerable local knowledge and who do not let themselves be fobbed off with implausible information. Generally speaking, the labour force surveys, where the interviewer comes to the respondent's home, give the biggest measured employment figures.

As regards the upward adjustment of “wages” to the self-employed, for sole proprietorships this consists in estimating a remuneration of work for the owners based on their annual accounts and then correcting this in all cases where it is considered to be under-declared. The theory is that, at a minimum, the self-employed receive remuneration for their work corresponding to the average wage for full-time employees in small firms in the same industry. If this does not tally with the accounts submitted to the tax authorities, the value added is adjusted by the amount needed to bring the self-employed in question up to the average wage for wage earners in comparable firms.

The final method is an estimation of certain parts of the restaurant trade from the expenditure side, i.e. based on consumers’ expenditure. It is well-known that the usual consumer surveys often grossly underestimate expenditure in cafés, restaurants, etc. However, the consumption estimates here differ from the usual consumer surveys in being targeted and in obtaining information via interviews rather than from the household accounting records. Using this method, the Italian bureau of statistics has uncovered a level of consumption in cafés, bars, restaurants and other eateries considerably higher than that indicated by other statistical sources.

The Italian method of measuring the extent of the black economy is in many ways innovative, and has been a model for similar studies in other countries. Generally speaking, the Italian approach represents an operational method for avoiding serious underestimation of GDP in economies with extensive black activities and a relatively lax tax control. Unlike the French method, the Italian approach does not require usable data from tax control campaigns. Conversely, the Italian approach is clearly based on a large number of assumptions, which can be problematical as regards quantifying the size of the black economy. Thus, the demographic approach can result in an overestimation of the black economy and with it GDP. This is because, as already mentioned, extrapolation is based on the assumption that the value added per full-time employee in each stratum is the same in both the white and black parts of the economy.

The demographic-based extrapolation of value added in the Italian national accounts is based on the proportionality hypothesis, which states that if a firm in a given stratum conceals  $x\%$  of its employees from the tax and social security authorities, it is keeping  $x\%$  of value added out of the accounts. It is also assumed that the accounts reported to the bureau of statistics contain the same under-declaration as the accounts submitted to the tax authorities. Existing empirical evidence shows that this last assumption is realistic. As regards the first, on the other hand, there is no a priori reason to believe that the figure for under-declared employment and the figure for under-declared value added are identi-

cal. If, as seems likely, black labour is generally less skilled and worse paid than white labour, then there is no a priori reason to expect proportionality.

Even with the same wages for white and black labour after tax and social contributions, the wages for black labour before tax, i.e. the employer's wage costs, will be considerably less than for white labour. In addition to this, in the case of 100% black activities in totally non-registered firms, as opposed to under-declaration, the indications are that the value added per employee will be less than in similar white businesses. The point is precisely that buyers of products such as construction and building repairs receive a large part of the tax that has been evaded in the form of lower prices. On the whole, it cannot be ruled out that extrapolating from demographic employment figures results in an overestimation of the extent of the black economy, and with it GDP.

In the UK, the national accounts have traditionally operated with a so-called evasion adjustment, which is based on the difference between GDP estimated from the expenditure side (sum of final expenditures) and income side (wages plus gross operating surplus plus indirect taxes minus subsidies) respectively. The tax statistics are the main source of information for the estimate of GDP from the income side. Since GDP estimated from the expenditure side has traditionally been higher than that estimated from the income side before adjustments for tax evasion, the difference has been attributed to the black economy, which was captured statistically by basing the estimate on information from the buyer side. The adjustment percentage is fixed for a benchmark year for which there is specific information on the expenditure side, e.g. in the form of surveys of tradesmen's expenditures. GDP estimated from the income side is then corrected in the following years by the fixed adjustment percentage before balancing with GDP estimated from the expenditure and production side to a single balanced GDP figure. In the benchmark year 1988, the evasion adjustment was 1.25% of GDP, of which almost 85% was attributed to tax evasion by the self-employed. 12% was attributed to black wages and the remaining 3% to corporate tax evasion.

The essentials of the British approach are used to a lesser extent in most countries where consumer surveys are used to uncover and quantify black activities and under-declaration (see also chapter 3 above). A classic example is expenditure on hairdressers, where consumer surveys almost consistently give higher figures than VAT and tax statistics. The problem with the method – which, in principle, has many advantages from a national accounting point of view, because respondents are asked directly about how much they have paid – is that consumer surveys are notoriously inexact as regards a number of expenditure items that are especially important for the black economy. For example, for various reasons consumer surveys are almost always biased in a downward di-

rection. Since the black economy is estimated as the difference between expenditure according to the (extrapolated) consumer survey and, typically, turnover according to company accounts or tax statistics, any underevaluation in the consumer survey can easily knock the method off balance. To a large extent, the general tendency to underestimate can be adjusted for, so consumer surveys are still a valuable source of information for the national accounts. But it is practically impossible to adjust for the gross underestimation for restaurants, bars and cafés, etc., in the extrapolation procedure. Since the restaurant sector in a broad sense is, to all appearances, one of the biggest areas for the black economy, the method runs into serious difficulties. The exception is Italy, where special targeted consumer surveys of expenditure on food and beverages outside the home have succeeded in uncovering a level of expenditure far above that indicated by all other sources. This is probably partly due to the targeted nature of the surveys and partly because a far larger proportion of Italians than, for example, Danes regularly frequent bars and cafés. In northern Europe, there seems to be a general tendency for those groups with a high expenditure on restaurants to be under-represented in consumer surveys. In addition to this, there is the problem of tourists, since foreign tourists' expenditure on hotels and restaurants is obviously not captured by the consumer surveys.

That the British method nevertheless reaches a figure of 1.25% of GDP is partly due to the fact that substantial, in part estimated, corrections are made to the consumer survey values for the hotel and restaurant sector in the estimate of GDP from the expenditure side.

#### **4.4 Size of the black economy**

As mentioned in the previous section, the general picture from EU members' national accounts is that the methods applied to measure the size of the black economy result to a very large extent in indirect or implicit corrections. In consequence it is only seldom possible to quantify the black economy directly. The exception is France, where, by virtue of the methods used, the statistical black economy outside the agricultural sector has been estimated at just over 4% of GDP, plus a bit extra for irregularities in financial reporting.

Apart from France, it is the Italian statisticians who have gone the furthest in the direction of a direct quantification of the black economy. Vincenzo Siesto<sup>13</sup>, the former director of the national accounts in ISTAT, has pioneered the work in this area. The method consists in comparing the value added in the national accounts (after usual grossing-up adjustments for activities, which, in principle, are covered by fiscal estimates) as well as adjustments for the actual black

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<sup>13</sup> Concepts and methods in the last revision of Italy's GDP. Paper presented to the European Conference on Medium-Term Economic Assessment, Rome, October 12-14, 1987.

economy in the form of black activities and under-declaration with the value added in the tax statistics. The method and results for Italy are described more fully in section 3.4.2 in chapter 3. The results indicate a black economy of the order of 18% of GDP. The method can result in an overestimation of the black economy, however. On the other hand, Siesto's estimations do not include black activities in two main industries, "agriculture" and "renting of dwelling", where production in the national accounts is estimated indirectly. This pulls in the opposite direction.

In recent years, the national accounts in both Greece, Portugal and Ireland have been revised using the demographic method, albeit not quite as systematically and well-documented as in Italy. These revisions have uncovered a considerable economic activity not previously identified, most conspicuously in Greece, where GDP was revised upwards by over 20%. Not all of this can be attributed to the black economy, however. Part is due to poor statistical coverage in the earlier national accounts, partly as a result of outdated company registers.

#### **4.5 Ongoing efforts to include the black economy in the national accounts**

A binding legal act has committed EU members to revising their GDP and GNP no later than the end of September 1998. By that date, all – in itself legal – economic activity which in principle is included in GDP must be included in it, irrespective of whether it originates in the white or black economy. In order to check progress on this, the Commission's statistical office, Eurostat, is carrying out both a comparison of the employment underlying the value added in the national accounts, using figures from censuses and labour force surveys, and a systematic check, industry by industry, of the extent to which the estimates include allowances for black activities. In Denmark's case, the demographic check based on the Italian model has not revealed any deficiencies, which concurs with the results from the Rockwool Foundation Research Unit, which show that, in Denmark, black activities is largely a subsidiary activity.

Until recently, the Danish national accounts only partly covered the black economy, and mainly by indirect methods. The new national accounts published in 1997 make an explicit estimate of black activities and under-declaration in a national accounting sense in all industries except agriculture and housing. In the future, there will only be implicit corrections for agricultural production and rental of dwelling. The same applies in most of the other EU countries. With the size of the black economy becoming more and more important in relation to EU finances, most countries now want to include this in the form of explicit corrections that are documentable.

The figures that all EU countries must report to the EU by September 1998 mean that, for the first time, member countries can present national accounts figures that can claim to cover everything, also as regards the black economy and fringe benefits. Among the south European countries, only Spain has not yet carried out a major revision of GDP in recent years. The new figures for Spain are therefore eagerly awaited. This interest is partly due to both its size and economic importance and the very high Spanish unemployment figures. In recent years, some analysts have asserted that the extremely high Spanish unemployment can conceal a substantial black economy – see also chapter 6 below.



## 5. New Danish figures for black activities, 1995-97

### 5.1 Introduction

Following the review of foreign researchers' attempts to measure the shadow economy and the EU's efforts to integrate the shadow economy in member countries' national accounts, this chapter presents the new Danish figures for black activities for the period 1995-97.

In Denmark, black activities are most often measured by means of questionnaire surveys. These have been carried out, using representative samples of the Danish population, at regular intervals since 1980. The first time this material was used in publication was in Viby Mogensen (1985).<sup>14</sup>

As mentioned in chapter 1, the term "black activities" is used in this book in stead of the term "black activities at less than full price" – selling at a low price off the records is thus also included, as, for example, when a farmer sells a pig or eggs on the side. In the Danish surveys, black activity is defined as an activity where *both* buyer *and* seller benefit from not declaring the transaction to the tax authorities. Ordinary tax evasion, on the other hand, where only the one party knows about the non-disclosure – e.g. when part of turnover bypasses the cash register – is not included in the Danish measurements.

In all the surveys in the period concerned, respondents have been asked identical questions. Similarly, the interviewers have received the same written instructions, which clearly explain to both interviewer and respondent what is meant by the term black activity. The question design is discussed in chapter 1, while the written interviewer instructions (plus questions) appear in appendix 1 in Viby Mogensen et al. (1995). The advantage of using the same questions and instructions, of course, is that it makes it easier to look at the development in black activities over time.

The questionnaire technique is not widely used outside Denmark (see chapter 3 and 6 in this book). From an international point of view, therefore, the Danish figures for the growth in black activities measured by this means are quite unique.

In some of the surveys, supplementary questions have also been asked, e.g. about respondents' views on the ethics of black activities, cf. Appendix 1, and

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<sup>14</sup> For English-language literature on black activities in Denmark, see Viby Mogensen (1990a, 1990b, 1992), Viby Mogensen et al. (1995), Pedersen (1995) and Pedersen & Smith (1995).

the risk of getting caught, cf. Viby Mogensen (1992). And the 1988/89 surveys asked searching questions about what the income from black activities was spent on, cf. Viby Mogensen (1990b).

## **5.2 Black activities in Denmark since 1980, measured by means of questionnaires**

The results of the Danish questionnaire surveys for the period 1980-94 are reported in more detail in Viby Mogensen et al. (1995). Only a brief outline will be given here, therefore.

Before presenting the results, however, a short description will be given of important aspects of the quality of the material, especially the response rates for the omnibus surveys.

Surveys have been carried out in 1980, 1984, 1986, 1988/89, 1991, 1993 and 1994 with a varying number of interviews, namely between 1000 and just under 4500 persons. All omnibus surveys have been carried out either by the Danish National Institute of Social Research's or Statistics Denmark's highly experienced interviewer corps.

The omnibus surveys were carried out as representative sample surveys, and all samples were selected on the basis of simple random selection from the CPR register (central personal register), which is a register of all persons residing in Denmark. Up to 1985, the surveys were carried out by means of face-to-face interviews, after which both the Danish National Institute of Social Research and Statistics Denmark went over to telephone interviews with follow-up interviews. This was standard practice up to and including 1991, after which only telephone interviews were carried out.

As can be seen in appendix table 3.3, the change in technique led to a fall in the response rate from around 75-78% of the original sample up to and including 1991 to around 66-69% thereafter. The higher non-response after 1991 is due to the fact that a lot of respondents either did not have a telephone or had an unlisted number and were therefore not contacted. It is important to note that this non-response is not connected with the questions on black activities, partly because it applies in general to all the omnibus surveys in Denmark and partly because the respondents did not know beforehand that they would be asked about black activities. It is also worth noting that, in recent years, the response rate for persons whom the interviewers actually do try to contact has been around 80%.

The proportion of persons who actually refuse to participate in the surveys is around 13-15%, with a slightly falling tendency in the later surveys.

By comparison, the overall response rate in the otherwise sound Dutch surveys was significantly lower, at 47-48%, with one at 41% in 1983 and 42-43% in 1984, cf. Kazemier & Van Eck (1992). In Isachsen & Strøm's analysis from 1980, the response rate was 73%, i.e. just under the level in the Danish surveys at that time. Lemieux et al. (1994) report a – again very low compared with the Danish surveys – response rate of 51.7% in a sample from Quebec City, Canada, in 1986. A more detailed description of the non-response in the latest Danish surveys appears in appendix 3.

The non-response, i.e. “do not know” and “not disclosed”, to the question on black activities – also called “item non-response” – is at a very low level, namely around 0.2-0.5%. The non-response to questions on, for example, personal gross income, which is also regarded as a sensitive question in the methodology literature, was over 10% in the 1980s and 7-10% in 1996 and 1997, which was considerably above the level for “item non-response” to the black questions. In the aforementioned Dutch surveys, “item non-response” lies between 3.6% and 6%, cf. Kazemier & Van Eck (1992). In the Norwegian survey from 1980 (Isachsen & Strøm, 1981), “item non-response” was 4.1%, cf. Sporastøyl (1982).

The first time questions were asked about black activities in Denmark, 8.3% said that they had engaged in black activities within the last year. This proportion rose to over 13% by the mid-1980s, and has since stabilised at around 13-15% of the population. The increase in the proportion who had been engaged in black activities was thus highest at the beginning of the 1980s.

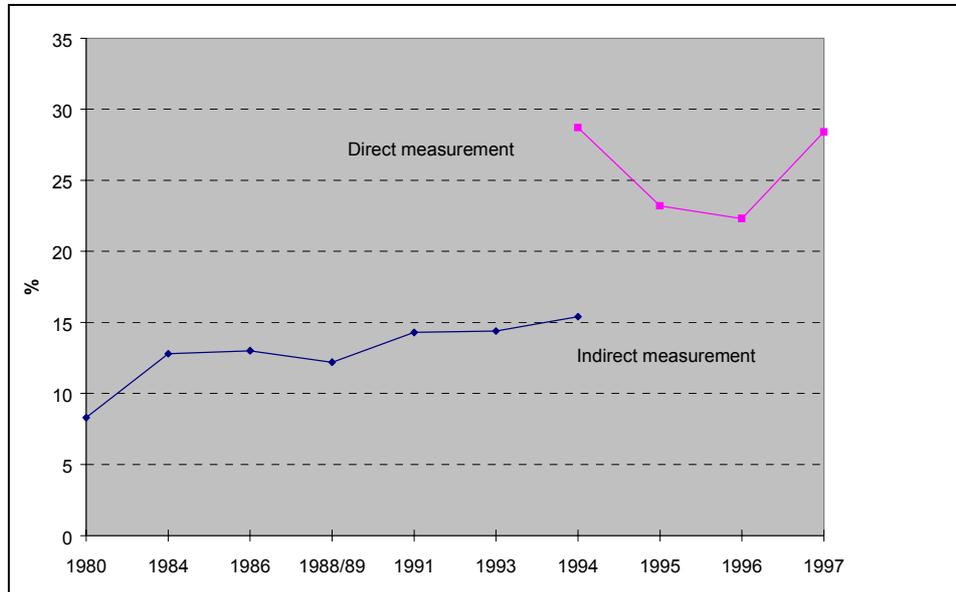
The above-mentioned surveys from 1980 and onwards adopted a relatively circumspect, i.e. indirect, approach to the subject of black activities, it being assumed that this was a sensitive topic to ask about. In 1994, however, in view of the extensive debate on black activities in previous years, it was judged that the time was now ripe to use a more direct approach to the question, cf. Viby Mogenssen et al. (1995).

After it had been decided to use a new question design for 1994, two omnibus surveys were carried out (in February and November) in order to increase the number of completed interviews. In addition, in order to compare the new with the old method, an extra omnibus survey was carried out in August, with a bigger sample than usual, in which the old question design was used. In 1994, therefore, the extent of the black sector in Denmark was measured using *both* methods.

Figure 5.1 shows the trend in the proportion of Danes who have engaged in black activities using both the old and new question design for the period 1980-

97. Due to slight differences in the age groups in the various omnibus surveys<sup>15</sup>, the frequencies in figure 5.1 are calculated on the basis of the 20-69-year-olds in the surveys.

Figure 5.1: Trend in the proportion of Danes in the 20-69 age group who have engaged in black activities, measured using more indirect and more direct questions respectively, 1980-97



As can be seen from figure 5.1, as a result of the new question design, the proportion of adult Danes (20-69-year-olds) who had engaged in black activities increased from just over 15% to just under 29% in 1994.<sup>16</sup>

Thus, the figures merely reflect two different measurements of the same phenomenon. The difference is probably partly due to the fact that the respondents have understood the questions better and partly because there are now more small-scale activities, e.g. black activities, where payment is in the form of a quid pro quo. This can be seen by the fact that the average time spent on black

<sup>15</sup> In the 1980 survey, only the 20-69-year-olds were asked about black activities. In 1984, 1986, 1988/89 and 1991, samples were taken from the 16-99-year-olds, while in 1993, 1994, 1995 and 1996, which were carried out by the Danish National Institute of Social Research, they were taken from the 18-99-year-olds. In the omnibus surveys in 1996 and 1997, carried out by Statistics Denmark, it was the 16-74-year-olds who were asked about black activities.

<sup>16</sup> Viby Mogensen et al. (1995) also draws attention to this difference, but for the 18+-year-olds.

activities was 4 hours a week under the old question design, but only 3 hours a week under the new, cf. Viby Mogensen et al. (1995) and below. In any case, there is no doubt that the new method, used since 1994, does measure the black sector – if still not accurately, then at least more accurately than the old method.

### 5.3 Black activities in the 1990s, measured by means of direct questions

#### Who are engaged in black activities?

It is obviously of interest to know who in particular are engaged in black activities.

As table 5.1 shows, it is especially men, the young and skilled workers who are active in the black labour market.

Table 5.1: Proportion of the population in the 18-74 age group who had engaged in black activity, by sex, age and occupation, in the period 1994-97<sup>1)</sup>

	1994 (Feb.+Nov.)		1995 (May)		1996 (Feb.+May+Aug.)		1997 (Feb.+May)	
	%	N	%	N	%	N	%	N
Men	36.9	1032	31.7	502	29.2	1795	36.6	977
Women	19.5	995	13.2	461	15.1	1879	17.8	943
18-19-years-old	54.2	72	35.3	34	39.4	127	35.1	74
20-29-years-old	44.2	382	33.9	183	33.5	665	44.4	322
30-39-years-old	35.5	420	28.0	193	25.9	808	33.2	392
40-49-years-old	26.7	420	23.6	212	22.5	799	28.3	407
50-59-years-old	19.0	342	13.9	173	14.9	632	21.0	376
60-69-years-old	12.0	274	11.8	119	9.5	465	11.2	249
70-74-years-old	6.8	117	8.2	49	5.1	178	5.0	100
Self-employed/ assisting spouse	36.8	152	18.8	69	24.6	281	31.5	143
Salaried employ- ees	24.8	789	21.5	396	19.4	1282	24.9	602
Wage earners, skilled	57.1	119	48.8	80	37.8	463	47.1	295
Wage earners, unskilled	32.3	198	24.5	110	27.5	443	34.9	229
Unemployed	31.7	164	13.7	51	21.0	200	20.2	89
Pensioners	11.5	384	12.3	162	9.5	655	9.7	360
In full-time education	46.4 <sup>2)</sup>	181 <sup>2)</sup>	35.1	77	30.5	262	34.5	148
Other	27.5	40	11.1	18	11.4	88	14.8	54
Total	28.4	2027	22.8	963	22.0	3674	27.4	1920

- 1) The 18-74 age group has been chosen, since this is common to all the omnibus surveys using the new question design.
- 2) In 1995, apprentices and vocational trainees in trades and clerical occupations respectively are classified as being in full-time education. In all the other surveys, trade apprentices/vocational trainees are classified as skilled workers, while clerical apprentices/vocational trainees are classified as salaried employees, which follows Viby Mogensen (1985) and Viby Mogensen et al. (1995).

In 1997, for example, 36.6% of men, against only 17.8% of women, had engaged in black activities in the past year. And over 35% of the young in the 18-20 age group and over 44% in the 20-29 age group have engaged in black activities, compared with, for example, 21% for the 50-59-year-olds. As regards skilled workers, almost 50% had engaged in black activities in 1997. But both the young in full-time education and, to a certain extent, the self-employed, have also been quite active in the black labour market.

While there is some variation from survey to survey, the pattern is clear and almost indistinguishable from that of surveys using the old, more indirect question design, cf. Viby Mogensen et al. (1995).

The proportion of Danes who have engaged in black activities fell from 28.4% in 1994 to 22.8% in 1995. This decrease is statistically significant. The overall level of black activities was the same in 1996 as in 1995, but the proportion who have engaged in black activities increased again from 1996 to 1997 to the same level as in 1994. This increase is also statistically significant.

As regards the unemployed, the impression is sometimes given in the public debate that this group is highly active in the black economy. When, for example, the Danish customs and tax authorities collaborate with the police and the Directorate of Unemployment Insurance to carry out surprise inspections of pizzerias or the vegetable market in Copenhagen, they almost always find unemployed persons or persons on social security who are engaged in black activities. As can be seen from table 5.1, however, there is no evidence to suggest that the unemployed are more engaged in black activities than the average for the population as a whole. On the contrary, apart from in 1994, the frequency of black activities for the unemployed is below the average.

The picture is far from clear, however. A study on work incentives carried out for the Rockwool Foundation Research Unit by Peder J. Pedersen and Nina Smith (1995) also included several questions on black activities. On the basis of this data, collected in 1993/94, it was shown that the probability of being engaged in black activities increases with the degree of unemployment. In other words, the longer the period of unemployment, the greater the likelihood of being engaged in black activities. Within the group of unemployed in general, however, the frequency of black activity is the same as or just under the average for the population as a whole.

One factor that might explain why the unemployed do not carry out more black activity than others is the relatively high level of unemployment benefit in Denmark. Compared with countries with a weaker welfare net, the unemployed

in Denmark are not forced, so to speak, to be engaged in black activities in order to preserve their former level of consumption.

As can be seen in chapter 6 below, the Norwegian and Dutch researchers have also been unable to demonstrate a strong correlation between unemployment and black activities. The same applies to the EU's research project from 1988-90 (see chapter 2 above). One possible reason given by the foreign researchers here is that a person who becomes unemployed loses his/her contact network from work, and with it a possible customer network. Another reason is that an unemployed person loses the possibility of borrowing the workshop or the employer's van for black activities at the weekend.

It should be noted here that, on this point in particular, the questionnaire method might suffer from a certain weakness. It cannot entirely be ruled out that especially the unemployed do not answer the questions completely honestly, despite guarantees of anonymity, inasmuch as they are cheating the system twice over – namely both the tax authorities and the unemployment insurance funds – and are likely to be overly nervous about getting caught.

If we look at the regional distribution of black activities, table 5.2 shows that, on average, there is a greater tendency for black activities west of the Storebælt (the Great Belt, which separates the island of Zealand, where Copenhagen is situated, from the rest of Denmark) than east of it. But the size of the differences between the regions varies from survey to survey.

Table 5.2: Black activities by region<sup>1)</sup>

	1994 (Feb.+Nov.)	1995 (May)	1996 (Feb.+May+Aug.)	1997 (Feb.+May)
Copenhagen	24.5%	17.9%	17.6%	26.1%
Copenhagen suburbs	26.3%	17.2%	17.5%	16.0%
Sealand+Lolland+Falster+Bornholm	29.7%	18.6%	19.3%	30.2%
Average east of the Great Belt	27.4%	18.0%	18.4%	24.8%
Funen	28.3%	34.1%	25.3%	31.6%
South Jutland	24.1%	31.3%	28.4%	23.5%
West Jutland	35.4%	24.5%	29.1%	35.2%
East Jutland	24.9%	25.5%	20.4%	23.6%
North Jutland	32.7%	21.9%	24.6%	32.8%
Average west of the Great Belt	29.1%	26.1%	24.4%	29.2%
Average for the whole country	28.4%	22.8%	22.0%	27.4%

Note: <sup>1)</sup> 18-74-year-olds

As regards the more detailed division by region, table 5.2 shows that, in three out of the four surveys, west Jutland has the highest incidence of black activity

and the suburbs of Copenhagen the lowest. Apart from this, it can be difficult to draw firm conclusions about the regional distribution of black activities. The picture is the same under the old question design. There was also a higher frequency of black activities west than east of the Great Belt using this method, and it was also in west Jutland that the incidence of black activities was highest, cf. Viby Mogensen et al. (1995).

#### **A logistic regression analysis of black activities**

In addition to these, so to speak “partial” analyses, an overall statistical analysis has also been carried out, in which all the explanatory variables are included at the same time. The logistic regression model is particularly suited here, since the dependent variable is binary: whether a person has been engaged in black activity or not.

The analysis includes all the explanatory variables which can be presumed, or which from previous analyses are known, to influence the likelihood of being engaged in black activities, namely sex, age, occupation, marital status, length of education, length of unemployment, personal gross income, regional distribution, and, lastly, the perception of the risk of getting caught. Table 5.3 shows the results of the analysis for 1996 and 1997.

Analyses have also been carried out for 1994 and 1995, but these are omitted here since they draw the same picture as the 1996 and 1997 surveys. Similar analyses have also been carried out using the old question design, which are published in Viby Mogensen et al. (1995).<sup>17</sup>

For men, it can be seen that, in both 1996 and 1997, skilled workers are significantly more likely to be engaged in black activities than others.<sup>18</sup> It can also be seen that the elderly are engaged in black activities the least. The older people get, therefore, the less likely they are to be engaged in black activities. In 1997, male students were significantly less engaged in black activities than others. The same applied in 1996, albeit not significantly. Again for men, the higher their income, the less likely they are to be engaged in black activities. A similar result was found for all respondents in the 1988/89 survey, cf. Viby Mogensen et al. (1995), while the variable was not significant in Pedersen & Smith’s (1995) analyses for 1993/94.<sup>19</sup>

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<sup>17</sup> The analyses in Viby Mogensen et al. (1995) are for men and women combined, while in table 5.3 there are separate analyses for men and women, since a separate analysis shows that men significantly are more engaged in black activities than women.

<sup>18</sup> A significance level of 5% is used here.

<sup>19</sup> However, Pedersen & Smith (1995) used net disposable income from the income statistics in Statistics Denmark, which, at the time the questions on black activities were asked, were two years older.

Table 5.3: Logistic regression of the likelihood of participating in black activities in 1996 and 1997 for men and women respectively in the 18-74 age group<sup>1)</sup>

	1996: (Feb.+May+Aug.)				1997: (Feb.+May)			
	Men		Women		Men		Women	
	Coefficient	Standard error	Coefficient	Standard error	Coefficient	Standard error	Coefficient	Standard error
Constant	-0.00524	0.3711	-1.0908	0.4862	0.5561	0.5652	-1.7624**	0.7077
Age								
18-25	0.5445**	0.2141	0.6002**	0.2222	0.2036	0.3058	0.3126	0.3566
26-35	0.5097**	0.1617	0.3706	0.1932	0.1650	0.2257	0.5190	0.2769
36-45	-	-	-	-	-	-	-	-
46-55	-0.0537	0.1651	-0.3610	0.2216	-0.7135**	0.2179	-0.2688	0.3138
56-74	-0.9045**	0.2330	-1.3689**	0.3395	-1.1006**	0.2908	-1.1106**	0.4929
Single	0.0137	0.1399	0.2554	0.1547	0.2261	0.1862	0.4267	0.2298
Cohabiting	-	-	-	-	-	-	-	-
Occupation:								
- self-employed	0.0458	0.1913	0.3630	0.3344	0.3644	0.2752	0.8182	0.4925
- salaried employees	-	-	-	-	-	-	-	-
- wage earners, skilled	0.6279**	0.1610	0.2181	0.2382	0.7703**	0.2100	0.2745	0.3339
- wage earners, unskilled	0.1803	0.1914	-0.0109	0.2298	0.1791	0.2655	0.3199	0.3318
- unemployed	-0.4527	0.4779	0.3086	0.3834	-0.7386	0.7363	0.4154	0.6340
- pensioner/early retiree	-0.3688	0.2688	0.1321	0.3305	-0.6469	0.3500	-0.2376	0.5048
- student	-0.4175	0.2746	0.4188	0.2391	-1.2196**	0.4082	0.6962	0.3684
- others without a job	0.4125	0.6594	-0.3152	0.4605	-1.1370	0.8451	0.2253	0.5356
Length of education	-0.0518**	0.0230	-0.0667**	0.0301	-0.0334	0.0321	-0.0176	0.0424
Length of unemployment <sup>2)</sup>	0.00160	0.0284	-0.0161	0.0233	-0.0112	0.0477	-0.0358	0.0385
Personal gross income <sup>3)</sup>	n.a.	n.a.	n.a.	n.a.	-0.00141**	0.000627	0.000632	0.00149
Risk of getting caught <sup>3),4)</sup>	n.a.	n.a.	n.a.	n.a.	0.0878	0.2054	0.6529**	0.2496
Place of residence:								
- Copenhagen	-0.8673**	0.2771	0.0409	0.3100	-0.0925	0.3662	-0.2913	0.4248
- Copenhagen suburbs	-0.5714**	0.2465	-0.0897	0.3126	-0.6878**	0.3366	-1.0135**	0.4611
- Other Zealand+Lol.+Fal.+Bornh.	-0.4137	0.2178	-0.3030	0.2877	-0.0599	0.3016	-0.1056	0.3703
- Funen	-	-	-	-	-	-	-	-
- South Jutland	-0.2263	0.2902	0.6578**	0.3331	-0.4378	0.4392	-0.1789	0.4985
- West Jutland	0.0924	0.2388	0.2687	0.2949	0.1465	0.3197	-0.5567	0.4431
- East Jutland	-0.4967**	0.2177	0.0548	0.2683	-0.5062	0.2970	-0.8211**	0.3834
- North Jutland	-0.2041	0.2189	0.1122	0.2761	0.1961	0.3160	-0.0534	0.3879
-2 log L		1979.920		1474.393		1070.005		693.155
Proportion with dependent variable =1		29.2%		15.1%		36.8%		18.8%
Number of observations		1795		1879		927		803

1) The dependent variable has the value 1 if the respondent has been engaged in black activities within the past 12 months, otherwise 0.

2) The length of unemployment indicates how many months the respondent has been unemployed. If the interviewee is not unemployed, the value is put at 0.

3) The question was only asked in the omnibus survey in February 1996, and is therefore omitted here.

4) The variable has the value 1 if the risk of getting caught by the authorities engaged in black activities is perceived as small or very small, otherwise 0.

\*\* Indicates that the coefficient is significant at the 5% level.

n.a. Indicates that the variable is not available in the survey.

The variable for gross income was not available in the 1996 survey. However, as can be seen from the table, the length of education now becomes significant, inasmuch as the longer the education, the less likelihood there is of being engaged in black activities. This is probably due to the fact that length of education and income are correlated, so the longer the education, the higher the income.

As regards the regional variation, table 5.3 shows that, in the 1996 survey, men are significantly less engaged in black activities in Copenhagen and suburbs than in east Jutland. In the 1997 survey, men only are engaged in black activities significantly less in the Copenhagen suburbs, while the other variables mentioned have the same correlation as in the 1997 survey – apart from north Jutland.

The perceived risk of getting caught engaging in black activities is not significant for men, though with the expected correlation: the less the perceived risk, the more the likelihood of engaging in black activities.

There are not quite as many significant variables for women as for men. But as for men, young women are more likely to be engaged in black activities than older women. As regards occupation, female students are very close to being engaged in black activities significantly more in the 1997 survey (significance probability of 0.0588), which is the opposite of men. In an analysis (not shown here) where men and women are not classified separately, students are more likely to be engaged in black activities than others, but the variable is not significant. Thus, the result from table 5.1 as regards students' black activities is not contradicted by the logistics regression analysis. In 1996, on the other hand, none of the occupational variables are significant for women.

If women think that there is only a small or very small risk of getting caught engaging in black activities, they are also significantly more likely to do so. The correlation is thus as could be expected beforehand.

In the 1996 survey, as for men, the likelihood of women engaging in black activities falls significantly with length of education. Conversely, the income variable is not significant in the 1997 survey, unlike for men.

The regional picture for women is less clear. In the 1997 survey, women living in the Copenhagen suburbs are less likely to be engaged in black activities. In 1996, there is significantly less likelihood of women engaging in black activities if they live in south Jutland.

Generally speaking, for both men and women it is not possible to draw a clear picture of the regional variation from year to year, apart from the fact that there appears to be least likelihood of black activities in Copenhagen and its suburbs. Whether there are significantly more or less black activities in the other regions varies from survey to survey. In an alternative analysis (not shown here) of black activities west and east of the Great Belt respectively, both men and women are significantly more likely to be engaged in black activities west of the Great Belt than east of it in the 1996 survey. In the 1997 survey, the variation is insignificant with the same correlation for men as in the 1996 survey, but with an inverse correlation for women.

On the basis of Pedersen & Smith's (1995) results regarding the length of unemployment and the greater likelihood of engaging in black activities, the analyses here attempt to construct a variable which indicates how long the unemployed have been unemployed.<sup>20</sup> But as table 5.3 shows, the variable is clearly insignificant in the surveys. It should be noted, however, that this variable cannot directly be compared with Pedersen & Smith's (1995), since they used a register variable for the degree of unemployment. It can also be seen from the table that there is no significant correlation between the variable for unemployment and black activities, either. This supports the finding in these surveys that the unemployed do not work significantly more in the black sector than other groups.

In summary, it can reasonably be concluded that it is especially men, the young and skilled wage earners who engage in black activities, while there is nothing to suggest excessively high black activity among the unemployed. As regards the regional variation, black activity is least likely in Copenhagen and its suburbs. And, as could be expected, the lower the perceived risk of detection, the greater the likelihood of engaging in black activities.

Having established who are engaged in black activities, the next sections turn to the type and time spent on black activities, and the extent of black activities in Denmark in the period 1994-97 measured using the new, more direct question design.

#### **5.4 Types of black activities**

Respondents who answered yes to having engaged in black activities were also asked about which activities this involved. There was a big willingness to answer: over 95% of those who said they had engaged in black activities also gave a fuller description of it. As can be seen from table 5.4, most black activity is

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<sup>20</sup> The question put to the unemployed is as follows: "How long is it since you had a job?"

carried out within the broad category of services. Thus, just under half of all black activities were carried out within the service industry in the form of cooking and serving at parties, hairdressing, repairs of especially cars, childminding, gardening, cleaning, etc.

This is followed by the construction industry, which accounted for over 35% of black activities in 1997. A comparison of this distribution with the previous surveys from 1988/89 (which was the first time respondents were asked about their activities) and up to 1994 shows that there has been a fairly stable distribution of the various types of black activities by sector over the years, cf. Pedersen (1995). There are some indications that the construction industry has increased its share slightly in recent years, however. There does not seem to be any great difference between the new and old question design here, either.

Table 5.4: Types of black activities, 1995-97. Percentage distribution

	1995 (May)	1996 (Feb.+May+Aug.)	1997 (Feb.+May)
<b>Agriculture, forestry and fisheries</b>	<b>8.4</b>	<b>6.1</b>	<b>4.6</b>
<b>Manufacturing</b>	<b>3.3</b>	<b>3.1</b>	<b>2.0</b>
<b>Trade</b>	<b>2.0</b>	<b>3.5</b>	<b>2.7</b>
<b>Construction</b>	<b>32.1</b>	<b>37.4</b>	<b>35.8</b>
Painter/paperhanger	10.4	10.7	9.6
Carpenter/joiner	2.7	7.0	4.6
Bricklayer	2.3	3.7	3.9
Other	16.7	16.1	17.7
<b>Service</b>	<b>48.2</b>	<b>44.4</b>	<b>47.8</b>
Repairs (mainly cars, not housing)	8.7	8.0	9.1
Accounting	2.7	2.1	2.8
Cleaning	3.3	5.2	4.5
Childminding	5.4	6.2	8.0
Gardening	7.0	6.7	6.7
Other (hairdressing, cooking, etc.)	21.1	16.2	16.7
<b>Other</b>	<b>6.0</b>	<b>5.5</b>	<b>7.0</b>
<b>Total</b>	<b>100</b>	<b>100</b>	<b>100</b>
Number of activities	299	1.106	712

Note: The activities are originally coded according to Statistics Denmark's "Dansk Branchekode 1993" (Danish Industry Codes), NACE/DB93, but grouped in another way. The February and November omnibuses from 1994 did not include questions about which type of black activities the respondents had carried out. Each respondent can specify up to six different types of black activities. The average number of disclosed activities is 1.3 in each of the three years. The number of hours spent on black activity is not included in the table.

### 5.5 Extent of black activities

Those respondents who admitted to having engaged in black activities were also asked how many hours a week it involved. That respondents are asked to specify an average weekly number of hours is due to the well-known problem that interviewees find it notoriously difficult to remember back in time. The purpose of

getting respondents to state a weekly number of hours is to make them extra careful to include all activities in the estimate of time spent on black activities.<sup>21</sup>

Table 5.5: Average time spent weekly on black activities in the period 1994-97 for those 18-74-year-olds who have engaged in black activities.

Year	Average time spent on black activities	Standard deviation	Proportion who give information on time use on black activities
1994 (Feb.+Nov.)	2 hrs.: 53 min.	4 hrs.: 34 min.	48%
1995 (May)	3 hrs.: 32 min.	4 hrs.: 58 min.	45%
1996 (Feb.+May+Aug.)	3 hrs.: 2 min.	4 hrs.: 51 min.	53%
1997	2 hrs.: 38 min.	4 hrs.: 50 min.	71%

Table 5.5 shows that the time spent on black activities varies a lot from survey to survey, namely between over 2½ and over 3½ hours. In 1997, those persons who had engaged in black activities spent an average 2 hours 38 minutes a week on it.<sup>22</sup> As can also be seen from the table, there is a relatively big standard deviation of the number of hours, which is one reason why there is no statistically significant difference between the average weekly number of hours.

But since respondents are asked to specify an average weekly number of hours spent on black activity, some variation is only to be expected. And it might not be easy to give a weekly average if black activity is not carried out on a regular basis. This can also be seen from the fact that only about 50% of respondents who admit to being engaged in black activities are able to specify the number of hours in the 1994-96 surveys. This rose to 71% in the 1997 survey, however. Closer analysis also shows that the proportion of those who had engaged in black activities, but who are unable to specify how many hours, is evenly distributed among the occupational groups.<sup>23</sup> Thus, there is nothing to indicate that the difficulty in specifying time use is restricted to one or more groups in particular.

Now that we know how many people are engaged in black activities and how much time is spent on this activity, we can estimate an average for how many hours the population as a whole spends on black activities. To do this, it must be assumed that those persons who do not disclose the number of hours they are carrying out black activities spend just as much time on black activities as those

<sup>21</sup> See Viby Mogensen (1985) for a more detailed discussion of and reason for this.

<sup>22</sup> With the old question design, the average weekly number of hours spent on black activities was 3 hours 56 minutes in 1994, cf. Viby Mogensen et al. (1995).

<sup>23</sup> Even among skilled wage earners, who might be expected to be better at remembering time spent on black activities, the proportion who can specify the number of hours involved is only around or just above the average for the population as a whole.

who can specify a black time use. But in view of the fact that there is a fairly even distribution among occupational groups – which, as was shown in section 5.3, is a crucial variable – between those who can and those who cannot specify the number of hours spent, this is not an unreasonable assumption.

Using the frequency of black activities from table 5.1 and the average time use from table 5.5, the average time spent on black activities by the population as a whole in the 18-74 age group can be estimated at:

1994: 49 minutes/week  
1995: 49 minutes/week  
1996: 40 minutes/week  
1997: 43 minutes/week

As can be seen, in 1997 every Dane in the 18-74 age group work an average of 43 minutes a week in the black economy.

In the earlier surveys of black activities using the older, more indirect question design, this figure – in line with experiences from, for example, Norwegian research (see also chapter 6 below) – was revised upwards by 20% in order to take account of presumed under-reporting, inasmuch as the activities being asked about were, of course, illegal (see, for example, Viby Mogensen (1990b)). But the new question design, with the higher frequencies for black activities that followed, was judged to be better than the old at determining the extent of black activities, cf. Viby Mogensen et al. (1995). It was therefore decided that it would no longer be reasonable to revise the figure upwards by 20% as in the older survey.

In order to determine the extent of black activities in relation to GDP, the number of hours worked in the black economy is compared with the number of hours in the formal economy. This implicitly assumes that productivity in the black economy is the same as productivity in the formal sector.

This is a debatable assumption, however. On the one hand, the higher after-tax payment for black activities, together with the element of choice and with it perhaps a higher motivation, suggests that productivity is higher in the black economy than in the formal economy. But on the other hand, lower productivity cannot be ruled out in the black sector either, since it is hardly likely that all the real capital in the formal economy is utilised to full capacity in black activities – even though the relevant part (workshops, tools, vans, etc.) probably is to a higher degree. Similarly, a lot of work in the black sector is probably done by persons who are not trained in the area in which it is carried out. If, in addition, there is less competition in the black than in the formal economy, this also sug-

gests that productivity is lower in the former. In the absence of clear figures for this, however, it is assumed that productivity is the same in both the black and formal economies.

The data about working hours in the formal economy comes from a special run from Statistics Denmark's labour force surveys (AKU) in 1994, 1995 and 1996, which are based on interviews with approximately 50,000 persons in the 15-66 age group. For the estimation here, working hours are defined as normal weekly working hours in main and second jobs for the 18-66-year-olds. The question about normal working hours which Statistics Denmark has asked is as follows: "How many hours a week do you normally work in this job"?<sup>24</sup> The questions about normal working hours in main and second jobs thus reflect the average number of hours worked. Alternatively, the number of hours *actually* worked in the previous week could be used. This figure is always lower than normal working hours, because of absence from work due to illness, holidays, further training, etc., cf. for example, Eurostat (1996). Since the questions on black activities only ask about an average weekly figure, and *not* how many hours were actually worked in the previous week, it has been decided to use normal working hours in the formal part of the economy.

The calculation of average weekly working hours on black activity as a percentage of average weekly working hours in the formal economy is shown in table 5.6. Statistics Denmark use the 15-66 age group in their labour force surveys, so table 5.6 calculates average weekly working hours on black activity for the 18-66 age group, which is the age group common to the labour force surveys and omnibus surveys of black activities.

As can be seen from table 5.6, average weekly working hours on black activities as a percentage of average weekly working hours in the formal economy fell from 3.4% in 1994 to 2.7% in 1997. This fall is partly due to a fall in average weekly working hours on black activities, and partly to a slight increase in working hours in the formal economy, resulting from continued economic growth in Denmark and with it rising employment. The increase in formal working hours only contributes very slightly to the fall in working hours on black activities in relation to working hours in the formal economy, however: If there had not been any change in working hours in the formal economy from 1994 to 1997, hours on black activities would only have been 2.8% (0.73/26.0) of working hours in the formal economy in 1997 instead of the 2.7% shown in table 5.6.

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<sup>24</sup> The question about the number of hours worked in a second job was: "How many hours a week do you normally spend on your sideline?"

Table 5.6: Working hours on black activities in relation to working hours in the formal economy, 1994-97

	Percentage of respondents who had engaged in black activities	Average weekly working hours on black activities for persons who have carried out black activities	Average weekly working hours on black activities for the population as a whole	Normal formal average weekly working hours for the population as a whole (main plus second job) <sup>1)</sup>	Average weekly working hours on black activities as a percentage of formal working hours
	18-66-year-olds	18-66-year-olds	18-66-year-olds	18-66-year-olds	
	1	2	3=1x2	4	5=3/4
	Share	Hours per week	Hours per week	Hours per week	Percentage
1994	30.6%	2.92	0.89	26.0	3.4%
1995	24.0%	3.46	0.83	26.7	3.1%
1996	23.4%	3.00	0.70	26.8	2.6%
1997	29.4%	2.47	0.73	27.2 <sup>2)</sup>	2.7%

1) The figures are from a special run from Statistics Denmark's labour force surveys.

2) The figures are projected by the average percentage annual growth for 1994-96.

If we now assume that there are no great differences in productivity between the two sectors, and transfer the working hours on black activities as percentage of total working hours in the formal economy in 1997 to a corresponding share of GDP, we get a figure of about 2.7% of GDP in 1997.

The Ministry of Economic Affairs (1997) estimates GDP at market prices in 1997 at DKK 1.067 bn. A cautious estimate would thus put the value of black activities at around DKK 29 bn in 1997. Even though the new question design is probably better at measuring the extent of black activities than the old, the 2.7% of GDP, or DKK 29 bn, must still be considered a minimum estimate. Obviously, therefore, there are still persons who do not answer the question about black activities honestly. There are probably also respondents who do not disclose the full extent of their black activities, despite the guarantees of anonymity from Statistics Denmark's or the Danish National Institute of Social Research's experienced interviewers.

The assumptions underlying this estimation are questionable, however, inasmuch as there is hardly much black activity in the housing sector (apart, that is, from a certain amount of black rental of rooms and weekend cottages), the chemical industry or the financial sector. In 1996, these three sectors combined constituted about 14.4% of GDP at factor cost, cf. Statistics Denmark (*Statistiske Efterretninger 1997:13*, p.14). Subtracting this from the estimate for GDP in 1997 gives a GDP of DKK 913 bn. But the formal market hours in the calculation, where black hours are related to formal market hours (see above), must also be reduced. This can, for example, be done by looking at how big a propor-

tion of total employment these sectors constitute. In 1996, employment in the three sectors amounted to 6.1% of total employment, cf. Statistics Denmark (Statistiske Efterretninger 1997:13, p.18). This gives an alternative figure for the size of the black sector of 2.9% of DKK 913 bn, corresponding to DKK 26 bn, or 2.4% of GDP.

If the above procedure is now repeated, but this time also including the public sector, then GDP must be reduced by 36.9%, while the formal market hours in the denominator must be reduced by 33.2% (adjusted for the higher proportion of part-time employment in the public sector). According to this estimation, the black sector will constitute 4.0% of DKK 673 bn, corresponding to DKK 27 bn or 2.5% of GDP.

It should be emphasised that, in estimating the extent of black activities in relation to GDP, it is assumed here that a given piece of work of given quality has the same real value, whether it is taxed or not. The above-mentioned estimate for black activities of DKK 26-29 bn in 1997 is thus also what the work would be worth if it were carried out in the formal economy.

The Rockwool Foundation's Research Unit has not asked directly about black wages. An alternative valuation of the black sector, as it is measured here, using the actual black prices paid – of perhaps half or a third of the formal market's prices – would have resulted in a figure of about DKK 9-15 bn, or about 0.8-1.4% of GDP.

A black price of half or a third of the formal market price is not unrealistic. In an analysis of black activities in 200 construction firms carried out by the Construction Industry's Employer's Association (Byggeriets Arbejdsgivere) in October 1994, it was estimated that the customer paid an hourly rate of DKK 239.12, including VAT, in 1994, compared with a black hourly rate of only DKK 98.70. According to the Employer's Association, therefore, the black hourly rate was 41% of the price in the formal market.

The above-mentioned value for the black sector of DKK 9-15 bn can be converted to an average hourly rate. Table 5.6 shows that the population as a whole between the ages of 18-66 carries out black activities on an average of 0.73 hours a week. This corresponds to 38 hours a year ( $0.73 \times 52$ )<sup>25</sup>. According to Statistisk tiårsoversigt (statistical ten-year review), 1997, p. 22, there were 3,458,627 persons between the ages of 18 and 66 in 1997. Thus, 131,427,826 hours ( $3,458,627 \times 38$ ) were spent on black activities in 1997. With a total *black*

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<sup>25</sup> It is not unreasonable to multiply by 52 here, since respondents are asked to state an average weekly figure for black activities.

*market value* of DKK 9 bn, the average black hourly wage is thus DKK 68 (DKK 9 bn/131,427,826), and DKK 114 with a total *black market value* of DKK 15 bn. The average black hourly wage can thus be estimated at between DKK 68-114.

The national accounts statisticians would value the extent of black activities at DKK 9-15 bn, since the national accounts value work at the actual price paid for it, which in this case is the black price. This merely reflects national accounting conventions. Thus, painting done by a skilled painter for a black price would be valued in the national accounts at this black price, notwithstanding that the real value of this work is probably 2-3 times higher in the formal market.

As regards ordinary tax evasion, it has been assumed up to now that tax evasion constitutes about a third of black activities, cf. Viby Mogensen (1985). This assumption is based on experiences from the Norwegian questionnaire surveys at the beginning of the 1980s and 1988/89, which are discussed in more detail in chapter 6 below. This corresponds to 0.8-0.9% of GDP at market prices in Denmark in 1997. If this is the case, the extent of black activities and tax evasion is around 3.2-3.6% of GDP at market prices in 1997, corresponding to DKK 35-39 bn.

### **5.6 Possible explanations for changes in the extent of black activities**

Judged by such objective criteria as response rates, refusal rates and “item non-response”, which are those normally used to measure the value of questionnaire surveys, there has been no “wild leap” in the omnibus surveys from 1994 to 1997 analysed here. Nor have the methods been changed, the interviewers receiving the same written instructions and using the same question design.

One possible explanation for changes over time could be a change in the customer group for black activities. However, as can be seen from table 5.7, the proportion of black activities carried out for cash or in the form of barter/friendly turns has been quite stable. There is therefore nothing to indicate that, for example, there has been a fall in the proportion of black activities carried out in the form of barter/friendly turns in the 1995 and 1996 surveys.

In 1994, by comparison, the proportion of black activities paid in cash using the old question design was over 34%, as opposed to just under 18% with the new design, cf. table 5.7 and Viby Mogensen et al. (1995). As also mentioned earlier, the new question design results in more activities of a smaller extent.

Table 5.7: Black activities by form of payment, 18-74-year-olds

	1994 (Feb.+Nov.)	1995 (May)	1996 (Feb.+May+Aug)	1997 (Feb.+May)
Cash	17.7%	17.3%	15.8%	12.7%
Quid pro quo/ friendly turn	64.9%	62.7%	62.2%	62.4%
Both cash and quid pro quo/friendly turn	17.4%	19.1%	21.9%	24.9%
Not disclosed	-	0.9%	0.1%	-
Total	100%	100%	100%	100%
No. of observations	575	220	809	526

From 1995, the number of hours worked in the black sector as a whole has been falling, while the frequency – after being stable in 1995 and 1996 – rose again in 1997. This coincided with a change in data collector – from the Danish National Institute of Social Research to Statistics Denmark – which, however, can hardly have greatly influenced the results.

Since there do not appear to have been any changes in measurement methods, the observed fall in the extent of black activities from 3.4% of GDP in 1994 to 2.7% of GDP in 1997 must be regarded as correct.

So what is the explanation for this fall?

In order to answer this, we must take a closer look at the factors that influence black activities.

If this 3-year period has any trend at all, it must be described as weakly but steadily falling. If this is the case, it is possibly especially due to the continuous boom in the Danish economy, as was also pointed out in Viby Mogensen et al. (1995). A growing economy, and with it employment – for example, in the form of more overtime – leaves less time for black activities. As has been shown above, black activities are especially rampant in the construction industry, where employment has risen by about 6% between May 1994 and May 1997, cf. Statistics Denmark (1996, 1997b).

On the other hand, despite the recent Danish tax reform, which lowered the marginal rate of taxation and put more emphasis on green taxes, the general perception of the difference between black and formal market prices is unlikely to have changed very much, which is presumably why this factor has not had any appreciable effect on the observed fall.

And nor has the difference between the black and formal market price changed as a result of government grants for improvements to and the maintenance of

housing – the so-called DKK 7000 grant, which rose to DKK 10,000 in 1993. This grant was withdrawn at the end of 1994<sup>26</sup>, after presumably having had an effect previously, as pointed out in Viby Mogensen et al. (1995).

The perception of the risk of getting caught carrying out black activities has probably also had an influence on the incidence of black activities. The first time a question was asked about the perceived risk of discovery by the authorities was in connection with the work of the Personal Tax Committee in 1992. As can be seen from table 5.8, there seems to have been an astonishingly stable low perceived risk of getting fined for engaging in black activities.

Table 5.8: Evaluation of the risk of fines, etc., 1992-97. Percentage distribution.

Risk	Carry out black activities			Does not carry out black activities			All		
	1992	1996	1997	1992	1996	1997	1992	1996	1997
Very big	1	4	3	2	3	6	2	3	5
Fairly big	7	11	12	9	17	16	9	16	15
Fairly small	40	40	32	41	43	37	41	43	36
Very small	47	38	51	35	25	35	37	27	40
Do not know	5	7	1	13	12	6	12	11	4
Total	100	100	99	100	100	100	101	100	100
No. of respondents	725	281	549	5232	1247	1430	5957	1528	1979

Note: The figures for 1992 differ somewhat from Viby Mogensen (1992), since not all the interviews had been carried out at the time the Tax Committee's report was published. The question put was as follows: "Those who carry out black activities run a certain risk of being discovered by the customs and tax authorities and, in addition to having to pay back the tax, possibly fined, etc. In your opinion, is this risk small or big?" The question was put to all persons in the surveys. Those who refused to answer are ignored.

Thus, in 1992, 78% (41+37) of the population as a whole perceived the risk of getting caught engaged in black activities as "fairly small" or "very small". After a fall in 1996, the proportion in 1997 was again nearly the same as in 1992, namely 76%.

The trend between 1992 and 1996 in the direction of greater respect for the possible consequences of detection might have something to do with the intensive campaign against black activities started by the tax authorities in 1994, though this only received extensive media coverage in 1995 and 1996 after the raids against, for example, the vegetable market in Copenhagen and restaurants and pubs elsewhere. Lately, however, these actions have received rather less media attention.<sup>27</sup>

<sup>26</sup> However, some grants were paid in 1995 – for work approved before the end of 1994 but first started in 1995.

<sup>27</sup> Unfortunately, there is no measurement of the assessment of risk in 1994. However, it can cautiously be assumed that this has not changed markedly between 1992 and 1994, because the campaigns only really got going in 1995 and 1996.

The effect in 1997 seems to be that, those who were previously uncertain about the risk (12% in 1992 and 11% in 1996) now think it is higher, while the proportion who rated the risk as being “fairly small” or “very small” is now almost back to the 1992 level.

As regards public ethics, these are hardly likely to have changed much in so short a period, and in the event that they have, it is probably in the direction of greater acceptance of tax evasion, cf. appendix 1. This cannot explain the fall in the extent of black activities from 1994 to 1997, therefore.

The Danish tax authorities have during late years run an information campaign towards pupils in the final year classes of elementary schools about income tax return, and future tax payment, and have used material which could form part of class discussions about black activities. A possible effect on their engaging in black activities, when they enter the labour market, can only be seen in the long run.

Nor has there been any change in the possibilities for engaging in black activities. Neither the proportion of skilled wage earners nor of the young in relation to the population as a whole changes much in just four years, of course.

To sum up, black activities have shown a weak tendency to fall in this short period. This probably owes less to political initiatives against the black sector than to the continuing growth of the Danish economy. If the boom ends or slackens off – or if the rise in the frequency of black activities from 1996 to 1997 continues in coming years – the fall in black activities might be stopped. A continuation in the growth of black activities might be due to the fact that some of the political initiatives to increase the risk factor only have a temporary effect, or that a continuing boom perhaps creates new opportunities for black activities, e.g. if building firms are unable to completely satisfy demand.

### **5.7 Closing remarks**

As we have seen, in 1994, a new, more direct question design was employed to uncover the extent of black activities in Denmark. This design has been used in surveys in 1994, 1995, 1996 and in 1997.

The Danish figures for the change in black activities for the period 1994-97 shows that, in 1997, just over 27% of the population in the 18-74 age group had been engaged in black activities, which is just below the level for 1994. The proportion was lower in 1995 and 1996, however, when only 22-23% of the population in this age group carried out black activities. Those who carried out black activities in 1997 did so on average 2 hours and 38 minutes a week.

In 1994, black activities amounted to 3.1-3.4% of GDP. This fell slowly but steadily up to 1997, namely to about 2.4-2.7% of GDP. In 1997, this corresponded to DKK 26-29 bn.

It is important to note that, in estimating the extent of black activities in relation to GDP, it is assumed here that a given piece of work of given quality has the same real value, whether it is taxed or not. Thus, the figure of DKK 26-29 bn for black activities in 1997 is also what the work would be worth if it were carried out in the formal market.

Alternatively, valuing the black sector using the actual black prices paid – of perhaps half to a third of formal market prices – would have reduced the figure for black activities to around DKK 9-15 bn, or 0.8-1.4% of GDP. The DKK 9-15 bn corresponds to an average black hourly wage of between DKK 68 and DKK 114.

To judge by research in neighbouring countries, in addition to this figure, total under-declaration in Denmark – i.e. including “ordinary tax evasion” – would probably have to be increased by an additional DKK 9-10 bn in 1997. In all, therefore, the shadow economy amounts to approximately DKK 35-39 bn in 1997, corresponding to about 3.2-3.6% of GDP in market prices.

The fall in black activities probably owes less to political initiatives against the black sector than to the continuing expansion of the Danish economy.

As with the old, more indirect question design, it is especially the young, men and skilled wage earners who are engaged in black activities. On the other hand, it is hard to demonstrate clear regional differences in the incidence of black activities.

The following chapter takes a closer look at questionnaire surveys of black activities in Norway, Sweden, Holland, Germany and Spain.

## **6. The shadow economy in Norway, Sweden, Holland, Germany and Spain measured by means of questionnaire surveys**

### **6.1 Introduction**

As mentioned in chapter 1, ideally, a comparison of the shadow economy in different countries requires that a number of conditions are met. Firstly, the same definition of the phenomenon must be used. Secondly, the same measurement method must be used. Thirdly, in principle simple, but in practice difficult to achieve, the same period must be measured.

As we have seen in chapter 2 and 3, these conditions have been hard to fulfil in studies of the shadow economy in the various countries up to now, which have mainly used indirect methods. This chapter attempts to compare the shadow economy in countries other than Denmark which have used the questionnaire method to measure the shadow economy, namely Norway, Sweden, Holland, Germany, and Spain. This at least meets the second condition mentioned above, but also approximately the first, that the same definition of the phenomenon is used.

There are two advantages of focusing on the questionnaire method: partly that it allows comparison with the Danish figures, and partly that, compared with the indirect method, it allows something to be said about the structure of the shadow economy – who in particular are active, and what are they characterised by?

### **6.2 Norway**

Probably one of the most quoted questionnaire surveys in the international literature on the shadow economy is that carried out by Arne Jon Isachsen and Steinar Strøm in Norway in 1980. The results have been published in the book *Skattefrit – svart sektor i vekst* (Tax-free – growth in the black sector) in 1981 and in the journal *Review of Income and Wealth* in 1985, plus as contributions in several other books, including Tanzi (1982), Wenig (1985) and Feige (1989). The questions from 1980 were repeated in 1983, but have only been reported in Isachsen & Strøm (1985) in outline form.

Additional questionnaire surveys of the shadow economy in Norway were carried out in 1988/89 and 1993, and published in Goldstein (1990) and Tufte (1994) respectively. After Denmark, Norway (together with Holland) has the

strongest tradition for carrying out questionnaire surveys of the shadow economy.

The interesting thing about the Norwegian surveys is that they have all used more or less comparable question designs, which makes it easier to describe the trend in the shadow economy over time. The following account will thus also draw heavily on a review of the Norwegian surveys.

### **6.2.1 Definition of black activities in the Norwegian questionnaire surveys**

Despite the fact that there have been different authors, all the surveys have – as mentioned above – used more or less the same definition. This is probably due to the relatively big impact of Isachsen & Strøm's survey from the beginning of the 1980s.

In Isachsen & Strøm (1981) and later Tufte (1994), "svart arbeid" (black activities), as it is called, describes an economic activity in the form of the sale of services, where the income is not declared to the tax authorities. Thus, both Tufte (1994) and Isachsen & Strøm (1981) ignore income that does not come from work, e.g. the sale of real estate, where part of the price is paid under the table, cf. Isachsen & Strøm. Tufte's (1994) definition of black activities does not, for example, include capital income that is not declared to the authorities. Tufte (1994) also mentions that his definition does not include fraudulent deductions either.

There is no clear definition of black activities in Goldstein (1990), but the fact that he uses more or less the same question design as Isachsen & Strøm indicates that he also uses the same definition as these researchers.

Despite the close similarity, the definition of black activities in the Norwegian surveys is not quite the same as in the Danish surveys. While there are questions in the former about work that is not declared to the tax authorities, the Norwegian definition also contains part of what in the Danish definition is called ordinary tax evasion. Respondents are asked about income from work that has not been declared to the tax authorities. The buyer of such work has therefore not necessarily had any economic benefit in the form of saved tax. Conversely, the Norwegian definition of black activities is also narrower than the Danish definition of black activities, inasmuch as the Norwegian definition does not include black transactions.

Nor does the Norwegian definition fully include what in the definition is called the shadow economy, i.e. both black activities in a narrow sense and tax evasion, inasmuch as, for example, fraud involving interest received or deductions is not included in the Norwegian definition.

On the whole, however, there is not much to distinguish between the two definitions. And the Danish and Norwegian definitions are easily the closest compared with the other countries. For practical reasons, therefore, the term “black activities” is used in the following, partly because there is not much difference in the definitions and partly because this is also the term used in Norwegian.

### 6.2.2 Methodology in the Norwegian surveys

Isachsen & Strøm (1981) and Goldstein (1990) use more or less the same question design. Thus, Isachsen & Strøm ask: “Har De i løpet av siste 12 mndr. Utført et arbeid hvor inntektene av dette ikke er blitt eller vil bli oppgitt til skattemyndighetene” (Have you during the past 12 months done any work where the income from this has not been or will not be disclosed to the tax authorities), while Goldstein asks: “Har du i løpet av de siste 12 måneder utført et arbeid hvor inntektene av dette ikke er blitt eller vil bli oppgitt til ligningsmyndighetene” (Have you during the past 12 months done any work where the income from this has not been or will not be disclosed to the tax assessment authorities). The question design from Isachsen & Strøm’s survey is reproduced in Sporastøyl (1982, pp. 168-176), which also contains the questionnaire in full.<sup>28</sup>

Unfortunately, in the latest survey, Tufte (1994) has changed the question a bit more: “Merk av om du selv har solgt/utført noen av disse tjenestene svart i løpet av 1993” (Set a cross if you have sold/carried out any of these services clandestinely yourself during 1993). This was followed by 13 possibilities which, in principle, covered all possible black activities (including a category called other services). The credibility of the answers was probably strengthened by the fact that, before being asked the question, a text was read to the respondent which clearly stated that the next question would be about the sale of black services. The previous question asked whether the respondent had paid for black work. This was also accompanied by a text which clarified what was meant by black activities. The word black is thus explained several times in the question design and in the accompanying texts to the questions on both the purchase and sale of black services.

According to Tufte, his questions are somewhat more direct than Isachsen & Strøm’s (1981) (and Goldstein’s (1990)), being phrased more in everyday language, and should therefore be easier to understand.

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<sup>28</sup> In Isachsen & Strøm (1981, p.130), the question is slightly different than in Sporastøyl (1982): “Har De i løpet av siste 12 måneder utført et arbeid uten å oppgi inntektene til skattemyndigheten?” (Have you during the past 12 months done any work without declaring the income to the tax authorities). However, since Sporastøyl has reproduced the questionnaire in full, it is this version of the question that is quoted here.

On the whole, however, the variations in question design between the Norwegian researchers are fairly insignificant.

Where the Norwegian surveys do differ among themselves, however, is in the way they collect data. Isachsen & Strøm used a postal questionnaire survey, in which 1198 persons were asked if they would participate in the survey. Of these, 877 returned the questionnaire, corresponding to a response rate of 73. By comparison, similar surveys in Denmark in 1980 and 1984 achieved response rates for face-to-face interviews of between 75-77% (see chapter 5 above and appendix table 3.3 in appendix 3).

Goldstein (1990) has also used a postal questionnaire to collect data about black activities. In the 1988/89 survey, Goldstein used the same market research institute – Markeds-og Mediainstituttet a/s (MMI) – as Isachsen & Strøm. A total of 1200 persons were selected by random sample, of which 1130 were interviewed for an omnibus survey. Of these, 988 agreed to take part in the survey. 820 completed and approved questionnaires were received. In relation to the “omnibusutvalget” (omnibus sample) (1130), 73% of the respondents were interviewed, and in relation to the original sample (1200), 68.3% of respondents were interviewed.

Tufte’s survey in 1994 was based on personal interviews carried out by SIFO/Gallup. Here, the more sensitive questions on black activities appeared in a separate questionnaire, without the interviewer being present, and returned in a sealed envelope. The possibility that the different designs for the three surveys might have influenced the results cannot be ruled out, though it is difficult to say in which direction, since postal questionnaires were used for the sensitive questions in all three surveys.

A serious defect in Tufte’s (1994) report compared with Isachsen & Strøm’s (1981) and Goldstein’s (1990) is that he says nothing about the response rate. This is somewhat surprising, since he does comment on the size of the non-response rate in Isachsen & Strøm’s survey from 1980. He does not even mention whether the selected and interviewed sample is representative. Conversely, both Isachsen & Strøm (1981) and Sporastøyl (1982) emphasise that, in Isachsen & Strøm’s survey from 1980, there is a strong over-representation of persons in the 25-39 age group and an under-representation in the 15-17 and 70 and over age groups. There is also an over-representation of men in the survey. In some cases, therefore, Isachsen & Strøm have chosen to weight their material, unlike Tufte – or Goldstein, for that matter. Nor do the two authors disclose the size of the “item non-response” for questions about black activities. Sporastøyl (1982) reports that the “item non-response” for the question about black activi-

ties is 4.1%, which is quite a bit higher than in the Danish surveys (see chapter 5 above).

### 6.2.3 Results for Norway, 1980-94

What is particularly interesting about the Norwegian analyses is that they have already asked several times about both the purchase and sale of black activities. By comparison, in Denmark the buyer side – whether respondents have bought black work – has so far only been described for 1983, cf. Viby Mogensen (1985). Table 6.1 shows the results of the Norwegian questionnaire surveys of black activities.

Table 6.1: Purchase and sale of black activities in the Norwegian questionnaire surveys

	1980	1983	1988/89	1994
Carried out black activities during the past 12 months	18%	16%	24%	15%
Bought black activities during the past 12 months	26%	25%	-	27%
Both carried out black activities and bought black activities	6%	8%	-	8%
Participated in the black market, total (net)	38%	33%	-	34%
Number	877	not disclosed	820	966

Source: Isachsen & Strøm (1981), Isachsen & Strøm (1985), Goldstein (1990) & Tufte (1994).

As can be seen from the table, there is some variation in the frequency of black activities in Norway. Thus, in 1980, 18% of the population (20% in the un-weighted figures) had engaged in black activities, falling slightly to 16% in 1983. According to Isachsen & Strøm (1985), this fall could be due to the fact that the publication of their first survey in 1981 (with figures for 1980) attracted a lot of attention and media coverage. The intensive media coverage of black activities can have made people less willing to answer the questions in 1983, so that the fall might be less real than it appears. However, there is nothing to indicate such an effect in Danish research, cf. Viby Mogensen (1990, p. 219), nor is there anything in the social science methodological literature to suggest that increased media awareness of sensitive topics should reduce respondents' willingness to answer questions.

Goldstein's (1990) figures for 1988/89 are markedly different from the other results, 24% saying that they have been engaged in black activities. Since Goldstein has used almost the same question design as Isachsen & Strøm (1981) in 1980, it can cautiously be concluded that there actually has been an increase throughout the 1980s in the proportion of the Norwegian population who have been engaged in black activities. Whether there was then a fall in numbers up to 1994 is hard to say, since the 15% in the Tufte (1994) survey are measured us-

ing a somewhat different measure, with no indication as to the size of the non-response rate.

If we instead turn to how many have bought black work, table 6.1 shows a much more stable level at around 25-27% of the population. As Tufte (1994) remarks, it is no surprise that more have bought black work than have carried it out, since people who provide black services can have numerous customers during the course of a year. Moreover, in the great majority of cases it is not illegal to purchase black activities (cf. Tufte, 1994; Isachsen & Strøm, 1981), so people are more willing to answer questions about this, cf. Isachsen & Strøm (1981). In the corresponding Danish survey from 1983, 19% of the population said that they had purchased black activities, while only 13% admitted to having engaged in black activities, cf. Viby Mogensen (1985). The Danish figures for the purchase of black activities thus lie below the level for Norway, possibly in part due to the aforementioned differences in definition.

If we now go back to the supply side, the structure – i.e. the sex, age, occupation, etc., of suppliers of black activities – greatly resembles that in Denmark, and, as we shall see later, also that in Sweden, Holland and Germany. Table 6.2 shows the proportion of persons who had engaged in black activities by sex for the various Norwegian surveys.

Table 6.2: Proportion of persons in Norway who had engaged in black activities, by sex

Engaged in black activities during the past 12 months	1980	1988/89	1994
Men	28%	32%	18%
Women	9%	16%	5%
Total	18%	24%	11%
Number	877	820	966

Note: The figures for 1994 are excluding black childminding, cf. Tufte (1994). Isachsen & Strøm's figures for 1983 are not distributed by sex.

Source: Isachsen & Strøm (1981), Goldstein (1990) and Tufte (1994).

As can be seen from table 6.2, in all the Norwegian surveys, more men than women had engaged in black activities. Unfortunately, Tufte (1994) does not include a distribution of black activities by both sex and childminding, which means that the difference between the sexes is probably exaggerated, since it must be assumed that more women than men carry out black childminding, cf. also Tufte (1994).

For both men and women in the survey from 1980, the young had engaged in black activities more than the old, cf. Isachsen & Strøm (1981). According to Sporstøyl (1982), over 50% of 18-24-year-old men had engaged in black activities, as opposed to only just over 10% of 55-69-year-old men. Tufte (1994) finds

a similar pattern in the 1994 survey. Just under 20% of the population in the 15-24 age group have been engaged in black activities (excluding black childminding). This proportion falls steadily with age. For example, only 4% of the 65-74-year-olds had engaged in black activities (excluding black childminding). Thus, there is a clear correlation in Norway and Denmark between age and black activities. The older the person, the less likely he/she is to have engaged in black activities.

With regard to education, Isachsen & Strøm's analysis shows that black activities are most frequent among persons with 8-12 years' education, which mainly covers vocational training courses. Tufte (1994) finds similar results in 1994. As in Denmark, therefore, it is primarily skilled workers who had engaged in black activities.

By means of a logistic regression analysis, Tufte also finds that both sex, age and education are statistically significant explanatory variables for black activities. As mentioned above, all the variables in a logistic regression analysis are interpreted in the same way. Unlike the other variables, however, household income has no significant importance for black activities. There is some evidence to suggest that the self-employed had engaged in black activities a bit more than other occupational groups, but the correlation is not statistically significant. As regards the unemployed and black activities, Tufte (1994) finds no statistically significant correlation in 1994.

The perception of the risk of being caught engaging in black activities has a significant effect on the extent of black activities. The higher the perceived risk, the less likely it is to occur. This result is reported in both Tufte (1994) and Isachsen & Strøm (1981).

In Isachsen & Strøm's survey, respondents were also asked about their marginal income tax: "Hva er Deres skatteprosent ved overtidsarbeide (Eventuelt Deres marginalskatteprosent)?" (What rate of income tax (or marginal tax) do you pay on overtime), cf. Sporastøyl (1982). According to Isachsen & Strøm (1981, 1989), the low-paid in particular overestimate their marginal tax compared with an estimated marginal tax. The above question design is not completely flawless, however, since only people in work can be expected to give any kind of answer (the question is about tax on overtime). Not surprisingly, therefore, about 28% of the respondents did not answer the question (Sporastøyl, 1982).

Notwithstanding, Sporastøyl has carried out a regression analysis in which respondents' own interpretation of marginal tax is included as an explanatory variable. For persons who did not disclose their marginal rate of tax, the estimate rate is used. Sporastøyl's analysis indicates that, for men, marginal income

tax has no significant importance, while there is a clear negative correlation for women. For women, therefore, the higher the marginal income tax, the less likely they are to be engaged in black activities. As mentioned previously, Pedersen & Smith (1995) were unable to find any significant correlation between marginal tax rates and black activities in Denmark.

As for who *buys* black work, Isachsen & Strøm (1981) find for 1980 that more men than women buy black work, and that the likelihood of buying black work rises with the level of education. Sporastøyl (1982) confirms this in a regression analysis, and also adds that income has a significant importance too: the higher the income, the more likely a person is to have bought black work. Similar results are reported in Tufte (1994), and Viby Mogensen (1985) has found similar correlations for the buyer side in the Danish black market in 1983. Viby Mogensen also found that people who own their own homes are more likely to buy black work.

According to Isachsen & Strøm (1981), 34% of actual black activities is in the form of skilled work. In Denmark, by comparison, skilled work makes up around 30% of the total, cf. Pedersen (1995) and chapter 5 above. Tufte (1994) reports the same pattern, measured from the buyer side. Skilled work – i.e. carpentry and joinery, painting, wall papering, heating, ventilation and air conditioning electrical installations, etc. – is by far the biggest group measured from the buyer side, followed by car repairs.

Even though the question of the quality of a piece of work is highly subjective, and there are problems in defining what quality is (cf. Tufte, 1994), the Norwegian surveys have nevertheless asked about this in both 1980 and 1994. In 1994, 91% of those who had bought black work were very satisfied or satisfied with the quality. Measured using a slightly differently framed question in 1980, 97% were more or less satisfied with the quality of the work. This is similar to the Danish results. In the aforementioned Danish survey from 1983, Viby Mogensen (1985) also asked respondents whether they were satisfied with the quality of the work. Of those who had bought black work, 93% said they were very satisfied or quite satisfied.

Some of the Norwegian surveys have asked how many hours were spent on black activities during the past 12 months. However, since many respondents probably can not remember all the black activities they have carried out – especially the smaller jobs – this must be expected to be an underestimate. The 1980 survey showed that an average 110 hours a year were spent on black activities, an average 88 hours for men and 179 for women, cf. Sporastøyl (1982).

Goldstein (1990) has not given the average time spent on black activities for either men or women in the 1988/89 survey. However, the average time use can be estimated from Goldstein's (1990) table 2 and 5. Thus, about 132 hours a year were spent on black activities, corresponding to over 2½ hours a week, in the 1988/89 survey. This is higher than Isachsen & Strøm's figure for 1980, though the structure was the same, with a higher average for women (171 hours a year) than for men (113 hours).

In a similar survey in Denmark in 1988/89, those who had engaged in black activities did so about 4 hours and 35 minutes a week, cf. Viby Mogensen et al. (1995), which is over 238 hours per year. While this is a higher figure than in the Norwegian surveys, it should be remembered that, as mentioned above, the Norwegian surveys ask about the past 12 months, which probably means that some activities have been forgotten. In the Danish survey in 1988/89, women had engaged in black activities more than men, as in the Norwegian survey, cf. Viby Mogensen (1990b). This was reversed in the Danish survey in 1995, however, cf. Pedersen & Smith (1995).

The average income for persons who had engaged in black activities in Norway in 1980 was NOK 5130 for women and NOK 3310 for men. The higher average income for women was due to the fact that women worked more hours than men. Women had an average hourly wage of NOK 27, against NOK 40 for men, cf. Isachsen & Strøm (1981) and Sporastøyl (1982). The average black hourly wage for all respondents in the survey was NOK 34.

Interval mid-points have been used in the calculation of average hourly wages, since respondents have been asked to state their hourly wage in intervals. For those who said that the black activity was done free for friends, the authors have set the black hourly wage at NOK 2. And for persons who receive payment for black activities in the form of a quid pro quo, the hourly wage has been set at NOK 10, cf. Sporastøyl (1982, p. 46 and 62). The real value of the work is probably much higher, of course, but neither Isachsen & Strøm (1981) nor Sporastøyl (1982) explain why they have not used a more realistic hourly wage.

Isachsen & Strøm have estimated that the average black income constitutes 4.6% of gross earnings for declared work for men and 17.9% for women. Black hourly wages vary from industry to industry, e.g. NOK 62 for consultancy work, teaching, etc., and NOK 21 within horticulture, agriculture and forestry.

Goldstein (1990) has not reported average hourly wages in the 1988/89 survey, though these can be calculated from his tables 2 and 5, cf. above. In 1988/89, the average black hourly wage for men was NOK 89 and NOK 57 for women. In all probably, this doubling compared with 1980 does not solely reflect a real

growth. Part of the increase is possibly due to the fact that Goldstein has not used such low values for black hourly wages where the work has been done for friends and acquaintances, or where payment is in the form of a quid pro quo, as Isachsen & Strøm (1981), cf. above. Thus, in calculating the average hourly wage, Goldstein uses NOK 33.3 as the lowest value, whereas the lowest values used by Isachsen & Strøm are NOK 2, 10, 25, 35 and 45, cf. Sporastøyl (1982, p.46). Tufte (1994) has asked about average black wages, but has unfortunately not reported it.

When both the number of hours worked in the black economy and the black hourly wage are known, it is possible to estimate the size of the black sector. Isachsen & Strøm (1981) employ a number of alternative methods for estimating the extent of black activities. Based solely on respondents' own figures for the number of hours spent on black activities and the black hourly wage – which, it must be remembered, was relatively low compared with later Norwegian estimates – Isachsen & Strøm estimate that black activities amounted to 0.85% of GDP in 1979.

The respondents were also asked how much black activity they think other people do. If a respondent has admitted to having been engaged in black activities, but has not been able to put a figure on it, then – somewhat problematically, of course – his estimate of how much he thinks other people have been engaged in black activities is used instead. By this means, black activity is estimated to constitute 1.4% of GDP in Norway. Yet another alternative employed by Isachsen & Strøm is to use the highest black hourly wage in the intervals. If, for example, a person has said that his/her black hourly wage lies in the interval NOK 31-40, NOK 40 is used in the calculation instead of the mid-point of the interval (NOK 35) used in the aforementioned calculations. Using this method, Isachsen & Strøm obtain a figure for black activities of 2.1% of GDP.

Based on the various alternative calculations, Isachsen & Strøm estimate that black activities amount to NOK 5-7 bn, or 2-3% of GDP, in 1979. Extrapolating the number of hours worked in the black economy to the population as a whole, Isachsen & Strøm obtain a figure for black activities of about 61 million working hours, corresponding to about 2% of the total number of working hours in the formal economy.

Isachsen & Strøm's survey from 1983, which, as mentioned above, is only reported in outline, contains an attempt at an ultimate measurement, in that they ask about total under-declaration, i.e. not just omitted earned income, but also omitted interest income and dividends, etc. Isachsen & Strøm now find that undeclared earned income constitutes 65% of total undeclared income (see also above). In addition, Isachsen & Strøm (1985) revise the aforementioned 2-3% of

GDP upwards in order to take account of the presumed under-reporting in a questionnaire survey. According to Isachsen & Strøm (1985), the true figure for the black sector in Norway is more like 4-6% of GDP.

Like Isachsen & Strøm for 1983, Goldstein (1990) has also asked about both omitted earned income (black activities) and total under-declaration, i.e. the sum of omitted earned income, interest, dividends or other forms of income. Goldstein finds that, for Norway in 1988/89, black activities alone amount to NOK 7.7 bn<sup>29</sup> and total under-declared income NOK 11.3 bn. If this is the case, the relation between black income and total under-declaration has not changed since 1983. For 1985, this means that black activities constitute approximately 1.3% of GDP and under-declared income about 1.9% of GDP.<sup>30</sup>

It should be noted that Goldstein's (1990) estimate for black activities of 1.3% of GDP is based on actual black wages. This figure can therefore be compared with the corresponding Danish estimate for 1997, which indicates an interval of 0.8-1.4% of GDP (see discussion in chapter 5 on the estimation of black activities). If black prices in Norway lie 50-60% below prices in the formal market, as is probably the case in Denmark, then the extent of black activities in formal market prices will be 2.6-3.9% of GDP.<sup>31</sup> To this must then be added approximately 0.6% of GDP for tax evasion, bringing Goldstein's figure for the shadow economy up to between 3.2 and 4.5% of GDP in formal market prices. And if this is also adjusted for the expected under-declaration in the questionnaire surveys, as Isachsen & Strøm (1985) do, the size of the shadow economy grows to 5.6% of GDP. This is the same level that Isachsen & Strøm find for the beginning of the 1980s, even though another extrapolation procedure has been used on Goldstein's figures than Isachsen & Strøm use.

#### **6.2.4 Closing remarks**

The Norwegian surveys of black activities resemble the Danish surveys in many ways. Firstly, there is not much difference in the definition of black activities, though the Norwegian surveys do not include black transactions. On the other hand, they do include parts of what in Danish terminology is called tax evasion, where the buyer of a piece of work is unaware that the supplier has no intention of declaring the income to the tax authorities.

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<sup>29</sup> By multiplying the number of annual hours worked in the black economy by the average black hourly wage for each person.

<sup>30</sup> The figures for GDP in Norway in 1988 come from *Nordisk statistisk årbog* (Nordic statistical year-book) 1992.

<sup>31</sup> This is not a completely unrealistic assumption, inasmuch as total taxes and duties amounted to 46.4% of GDP in 1984, against 48% of GDP in Denmark in 1984, cf. *Statistics Denmark* (1987, p.150).

Secondly, the structure of black activities also resembles the Danish structure, where it is especially men and the young who had engaged in black activities. As regards occupation, it is especially skilled workers who are active in the black markets.

The Norwegian survey from 1994 has been unable to demonstrate any statistically significant correlation between unemployment and black activities.

There is no clear correlation between marginal income tax and black activities in Norway. There is no statistically significant correlation for men, while for women, the higher the marginal tax, the less likely they are to have been engaged in black activities. It should be remembered here, however, that the variable for marginal tax must be interpreted with care.

On average, 18% of the Norwegians had engaged in black activities about 110 hours a year in 1980. In 1988/89, using a more or less identical question design, 24% of the Norwegians now say that they have been engaged in black activities – on average 132 hours a year. Thus, both the proportion of the Norwegians who have been engaged in black activities and the number of hours they have been engaged in black activities have risen throughout the 1980s. In 1994, 15% of the Norwegians said they had engaged in black activities. Whether this reflects a real fall is difficult to say, however, since a different questionnaire technique was used in 1994.

Based on several different calculation methods, the extent of black activities is estimated to be 2-3% of GDP in 1979, later revised to 4-6% for 1983 to take account of ordinary tax evasion and probable under-reporting in questionnaire surveys. The figures for 1988/89 suggest a level of around 5-6% of GDP, though using a different extrapolation procedure than in 1980-83. There is therefore no great difference between the level of black activities in Norway and Denmark.

### **6.3 Sweden**

In Sweden, there have been no large-scale representative questionnaire surveys of black activities of the kind carried out in Denmark and Norway. This can be seen from Riksskatteverket's (1996) report on household services, for which the Rockwool Foundation Research Unit has supplied tables about the black labour market in Denmark. Thus, for lack of anything better, Riksskatteverket has assumed that the Danish conditions will also apply to Sweden.

On the other hand, Swedish research has focused more on the possibilities for measuring the black sector via the national accounts statistics, cf. chapter 3.

Questionnaire surveys have been carried out, however, though primarily about the shadow economy as a whole, of which black activities are only a part.

There are no measures for the extent of the shadow economy in relation to GDP in these questionnaire surveys, though Apel (1994) has given an estimate for the extent of the shadow economy (see chapter 3) based on Swedish household budget surveys. At first sight, therefore, it is somewhat difficult to compare the extent of black activities in Sweden with the other countries. That these surveys are discussed here is because they nevertheless give an interesting picture of the structure of the shadow economy. The following account is based on Laurin (1986) and Wahlund (1991), and, to a lesser extent, also Malmer & Persson (1994).

### **6.3.1 Laurin's (1986) definition of tax evasion**

Urban Laurin describes and explains tax evasion in a political science thesis from 1986. His aim is not so much to measure the extent of tax evasion in relation to, for example, GDP, as to examine its causes.

Laurin (1986) defines tax evasion as consisting partly of income which is not declared to the tax authorities, and partly of declared deductions that are higher than they really are. In view of the questions asked, it is unlikely that tax evasion in the form of barter services is measured, cf. Laurin (1986). According to Laurin, these are probably fairly insignificant, and underestimating them probably does not affect the overall result very much. This is because not all forms of barter services are taxable. According to Laurin, Swedish tax laws are unclear about when a friendly turn becomes subject to tax. Even doing someone a favour within your own occupation is not always taxable under Swedish tax laws, unlike in Denmark. Only if the activity is repeated and systematised does it become taxable. Laurin therefore abandons any attempt to measure cases where tax evasion is in the form of favours.

Laurin (1986) thus measures the whole of the shadow economy, i.e. that which in Danish terminology consists of ordinary under-declaration at full price – tax evasion - where only the one party knows about it, plus black activities, where both parties (buyer and seller) benefit, since they share the tax saved between them.

### **6.3.2 Laurin's methods and results**

A questionnaire survey of a random sample of the Swedish population was carried out at the end of 1981 and beginning of 1982. The self-employed were over-represented in order to ensure that there were enough in this group for purposes of analysis.

Of the original sample size of 1200 persons, 80.3% replied. The non-response rate was 14.7% - lower, according to Laurin, than in similar surveys. In all, the equivalent of 21.5% of the adult Swedish population between 17 and 75 years of age have not disclosed all their income to the tax authorities. This figure should be interpreted somewhat cautiously, however, since it is not related to any specific period. The question was whether respondents have "declared all income, no matter how small, every year". In principle, therefore, the question applies to all the years the respondent has been liable to pay tax. However, it can be deduced from the following question that over 75% have not declared all income within the past two years. Converted to a figure for the population as a whole, this means that 16% of the population have evaded tax within the past two years.

11.4% of all respondents refused to answer the question about whether they have disclosed all income to the tax authorities ("item non-response"). This is considerably higher than in the Dutch survey (3-6%) and the Norwegian survey from 1980 (4.1%), and way above the Danish level, which is normally between 0.2-0.5% for questions on black activities, cf. Viby Mogensen et al. (1995) and chapter 5 above. Furthermore, 11.9% say that they cheated the tax authorities three or more years ago, despite the fact that this answer category was not even available. So there is every reason to treat the results with caution.

Laurin also asks whether respondents have been engaged in black activities within the last 12 months, to which 12% say yes. However, unlike in the Danish surveys, Laurin does not distinguish between income fiddling and black activities. His figures for black activities thus cannot be compared to those in the Danish surveys. Moreover, the question does not define what is meant by black activities at all. Thus, respondents' answers are based on what *they* think black activity is. Laurin also combines income fiddling with black activities in his analysis, obtaining a figure for income fiddlers of 23.4%, which is 1.9% higher than his first figure. Combining these two is clearly problematical, since the question about black activities is unclear and only concerns the past 12 months, whereas, in principle, the question on tax evasion concerns all the years a person has been liable to tax, cf. above.

Laurin includes a third question about tax evasion to enable him to compare his survey with an earlier Swedish survey in the 1970s. Basically, the question asked whether respondents included themselves in the group who declare all their income to the tax authorities every year. This question is also problematical in several respects, as Laurin himself concedes. In the first place, a respondent can regard himself as belonging to a group which does not declare all income, but this is not the same as saying that he does not declare all his income. Furthermore, the answer possibilities include the following: "Yes, on the whole"

and “No, not exactly”. As Laurin himself admits, it is not easy to interpret such an answer: You either belong to this group or you do not. Third, Laurin only asks about tax evasion in connection with extra income, which, in all likelihood, underestimates the true figure. Thus, there are probably some persons who do not have any extra income, but who are in full-time employment, the income from which they do not declare to the tax authorities at all (e.g. an unemployed person who is carrying out black activities at full-time).

In Laurin’s survey, 22.4% of the population say that they belong to the group which does not declare all income.

Despite the serious problems in interpreting this question, Laurin still chooses to combine it with the aforementioned questions on tax evasion and black activities. By this means, he obtains a figure for tax evasion of 30.4% of the Swedish population. It is these 30.4% who are analysed later in the thesis. The results briefly referred to in the following should therefore be interpreted with extreme caution.

A cross-tabulation of sex, age and tax evasion shows that it is especially young men who evade tax. Thus, all of 71% of men in the 17-20 age group cheat, though this is based on a sample of only 36 respondents. There is somewhat less variation as regards tax evasion and urban areas. There is thus a tendency for tax evasion to rise with falling urbanisation, i.e. the likelihood of tax evasion is higher in the country than in the towns.

In general, it is students (50%), the self-employed (52%) and skilled workers in manufacturing (51%) who evade tax in one way or another. Employees in the construction industry also admit to evading tax (51%). There is nothing to indicate that the unemployed evade tax more than other groups. This group lies around the average for the population as a whole, namely 30%.

Laurin has also asked separately whether people have “ever” claimed a deduction they are not entitled to or a higher deduction than they are entitled to from the tax authorities. Also, in principle, concerning all the years a person has been liable to pay tax. By adding the fraudulent deductions to the other kinds of income swindling and black activities, Laurin obtains a figure of 35.2% of the population in the 17-75 age group who evaded tax in Sweden in 1981. As Laurin observes, cheating with deductions requires a greater effort than income tax evasion (where income is merely left out of the tax return), since the person doing the cheating often has to convince the tax authorities that he/she is entitled to the deduction. Furthermore, it also requires some knowledge of tax laws, and often the ability to argue with the tax authorities.

12% of the population say that they have declared unentitled or too-high deductions. As before, it is the young and men who declare too-high deductions.

Distributed by occupation, it is especially students (29%) and middle- and upper-level public servants (24% and 25%), and, to a lesser extent, the self-employed (15%) who have cheated with deductions. This group is characterised by the fact that they must be presumed to have sufficient knowledge of tax laws to enable them to cheat. Laurin also shows that the higher the education, the greater the likelihood of cheating with deductions.

Laurin has also looked for a correlation between the risk of being caught evading tax and the actual probability of evading tax. In general, Swedes think the chances of being caught are fairly high – 87% of the population think that they will definitely or probably be caught if they try to evade tax. This is completely different from Danes' perception in the 1990s of the risk of being caught engaging in black activities, cf. chapter 5 above. However, it is not easy to compare the two, since the Danish survey asks specifically about the risk of penalty for black activities, while the Swedish survey asks about the risk of penalty for tax evasion as a whole. It cannot be ruled out that the perceived risk would be higher in the Danish survey if it involved tax evasion and not just black activities.

There is clearly a contradiction between the high proportion in the Swedish survey who expect to be caught evading tax and the over 30% who, according to Laurin, evade tax in one way or another. Laurin has no suitable measure for respondents' perception of the penalty for evading tax, but thinks that there is not much to indicate that Swedes perceive the actual penalty for tax evasion as especially high.

The results of Laurin's analysis of the perceived risk of penalty also shows, in accordance with economic theory, that the smaller the perceived risk of penalty, the greater the likelihood that a person will evade tax. The same has been demonstrated in the Danish surveys regarding black activities, cf. Viby Mogensen (1992), and in the latest survey of black activities in 1997, cf. chapter 5 above.

It should be emphasised that Laurin was unable to find any correlation between paid taxes and tax evasion. Again according to economic theory, the higher the tax, the more likely people are to try to evade it. In Laurin's analysis, not even perceived marginal tax had any influence on the incidence of tax evasion. On the contrary, Laurin finds that tax evaders are evenly distributed over the intervals for actual paid taxes and perceived marginal taxes. Peder J. Pedersen and Nina Smith (1995) have also been unable to demonstrate a correlation between

black activities and marginal taxes or perceived marginal taxes in the Danish data for 1993/94.

In summary, there are very serious problems with definition and method in Laurin's analyses of tax evasion in Sweden. Notwithstanding, the pattern of income tax evasion resembles that for black activities in Denmark in many ways.

### **6.3.3 Wahlund's (1991) definition of tax evasion**

In 1991, Richard Wahlund carried out a comprehensive analysis of the effects on tax evasion and saving of the tax reform in Sweden in 1982 (Wahlund, 1991).

Wahlund's defines tax evasion as that part of income or taxable income that is not declared to the tax authorities. He also includes claiming deductions you are not entitled to as tax evasion. Thus, Wahlund, in line with many other researchers in the field, ignores tax avoidance. With tax avoidance, the law is exploited up to the limit, and while the tax saved is not in contravention of the law, it does perhaps contravene the spirit of the law.

Thus Wahlund, like Laurin (1986), also uses the term tax evasion. The two definitions are also identical, which is why the term tax evasion is used here. It corresponds to the shadow economy in the Danish definition – i.e. both tax evasion and black activities.

In practice, Wahlund (1991) uses two questions to measure tax evasion, which partly overlap. One question asks whether the respondent has received black payment ("svart betalning") for work or a favour within the past year. As in the Danish surveys, therefore, the words black payment is used explicitly in the question design, and the period of time used – one year – is also the same.

The other question differs from the first in two ways. The concept of income is broader, also including, for example, interest received, and the period of time is expanded to recent years. By means of a cross-tabulation, Wahlund finds that the two questions partly measure the same thing. Clearly, therefore, Wahlund does not distinguish between black activities in a narrow sense and ordinary tax evasion – as opposed to the Danish surveys – where only the one party knows about and benefits from the under-declaration.

It should also be mentioned that Wahlund has asked whether respondents have declared too-high deductions. In the following, however, the main focus will be on the results concerning black money, i.e. whether a person has been engaged in black activities, since this is the closest to the Danish surveys, even though Wahlund's question also captures a lot of ordinary tax evasion.

#### **6.3.4 Wahlund's methods and results**

Wahlund carried out four interview surveys between the end of 1982 and the middle of 1984. These are seriously flawed, however, in that they only concern men. It is therefore not possible to estimate the extent of tax evasion in relation to, for example, GDP.

In all, 1752 interviews were conducted out of a sample of 2421, corresponding to a response rate of 72.4%. The item non-response was generally very low – less than 10 persons per question, or 0.6%, with the highest, 5.7%, for a question about party affiliation. The persons interviewed were all men in the 20-65 age group. Of the 1752 interviewed, 17.1% said that they had received black money within the past year. As mentioned above, this also partly covers what in the Danish survey is called tax evasion.

While it is therefore not possible to directly compare Wahlund's figures with the Danish figures, it can be mentioned that, in the period 1984-1988/89, the frequency among men who carried out black activities in Denmark was around 17%, cf. Viby Mogensen et al. (1995).

Wahlund has carried out a regression analysis in order to find out which variables are significant as regards receiving income from black activities. It turns out that the most important explanatory variable is the actual opportunity for black activities. Another important variable is attitudes to tax evasion. The less negative a person's attitude to tax evasion – or, put another way, the more a person accepts it – the greater the likelihood that that person has received black money. Like Laurin (1986), Wahlund (1991) finds that the lower the perceived risk of getting caught carrying out black activities, the greater the likelihood of a person actually carrying out black activities. Age is also a significant explanatory variable. Thus, the older a person is, the less likely he is to have been engaged in black activities.

According to Wahlund, 7% of the population cheat with deductions. This is a lot less than the 12% which Laurin (1986) found, and his figure was an average for both men and women. Laurin's figure for men alone would probably be even higher. Like Laurin (1986), Wahlund also finds that the higher the education, the greater the likelihood of cheating with deductions. Attitudes to tax evasion and the perception of the possibility for evading tax influences cheating with deductions in the same way as for black activities. The less negative a person's attitude to tax evasion, the greater the likelihood of cheating with deductions. And if a person thinks there are good possibilities for cheating the tax authorities, then he is also very likely to do the same with deductions.

It is interesting to note in Wahlund's analyses that marginal tax has no significant explanatory importance for black activities. As previously mentioned, the same applied in the Danish surveys, and nor could Laurin (1986) find any correlation between tax evasion and marginal tax. In Wahlund's analyses, not even a person's perceived marginal tax has any significant importance. Pedersen & Smith (1995) found a similar result for Denmark.

### **6.3.5 Closing remarks**

A comparison of the Swedish and Danish questionnaire surveys as regards the definition of what is being measured shows that the Swedish surveys, in addition to black activities, also include ordinary tax evasion, where only the one party benefits.

There have not been as many questionnaire surveys in Sweden as in, for example, Denmark, and due to the question design used the results are not easy to interpret. However, Wahlund (1991) found that 17.1% of men (his surveys were of men only) had engaged in black activities in 1982-84. In the Danish surveys in the 1980s, the level was around 17% - also for men. Laurin (1986) found that about 12% of the Swedish population had engaged in black activities, which is not much different from the Danish level in the 1980s for the whole population, cf. Viby Mogensen et al. (1995).

The general picture in both the Swedish and Danish surveys is that men are active in the black markets, and especially the young. But skilled workers, and, to a certain extent, students, are also very active. As regards which groups are particularly active, therefore, there is not much difference in the structure between the two countries.

Thus, the Swedish questionnaire surveys support – which might intuitively also have been expected – the picture of a structure for the black economy in Sweden closely resembling the Danish.

There has been no attempt to measure the extent of black activities in relation to, for example, GDP. In Sweden, studies of discrepancies and residuals in the national accounts statistics have a greater weight in research, and data for the period 1970-91 does exist, cf. chapter 3. The results of these studies give a level for the shadow economy of just under 5% of GDP in 1991, with a falling tendency for the period 1980-91. Just looking at black wages and an income residual, which in the Danish surveys would correspond to black activities and tax evasion, gives a level of 1.8% of GDP.

It is therefore difficult to compare the extent of black activities in Sweden and Denmark, since the two countries employ different definitions of black activities – the Swedish being broader than the Danish – and use different methods to

measure it. If an attempt is made anyway, there is no great difference in the level. In Denmark, black activities and tax evasion are estimated to constitute 3-4% of GDP, which is not far from the figure of around 5% for Sweden in 1991, and the trend is towards convergence, measurements showing a falling tendency in the extent of the shadow economy in Sweden and a rise in Denmark.

#### **6.4 Holland**

As mentioned previously, Holland – besides Denmark and Norway – is the one country in Europe which has carried out the most detailed surveys of the black economy using the questionnaire method. This section draws especially on articles by Kazemier & Van Eck (1988) and Van Eck & Kazemier (1992), and, to a lesser extent, Kazemier (1991) and Renooy (1990).

Section 6.4.1 explains Kazemier and Van Eck's definition of the hidden economy. The next section discusses the definition used in practice in the empirical analyses, followed, in section 6.4.3, by a description of the results of the questionnaire surveys on the black economy in Holland.

The chapter closes with a discussion of Kazemier (1991), who uses a completely different method to examine the extent of tax evasion as regards interest income.

##### **6.4.1 Principal definition of the black economy in the questionnaire surveys**

The Dutch analyses take a starting point in the national accounts. Thus, they focus only on economic activities as defined in the national accounts, ignoring housework, DIY activities and criminal activities.

Only income from productive activities are relevant in the Dutch surveys. Thus, income from, for example, income transfers, is not included.

Income from production is defined as hidden if it has not been disclosed to the tax authorities or welfare authorities. The purpose of concealing income is thus to avoid paying tax or to receive a higher benefit than one is entitled to.

Compared with the Danish terms in figure 1.1 in chapter 1, therefore, the Dutch definition covers "the black economy", i.e. both "black activities in a narrow sense" and "ordinary under-declaration".

Neither the Danish nor Dutch definition of shadow economy/black economy includes special tax-related schemes, the purpose of which is to exploit loopholes in the law to save tax, cf. chapter 1. The purpose of such schemes is, as mentioned earlier, not only to exploit the law to the full, but also to avoid cross-

ing the line between the legal and the illegal. In other words, while such schemes operate within the law, they perhaps violate the intentions behind the law. Being legal, these schemes do not avoid registration, either.

#### **6.4.2 The definition used in practice in the Dutch questionnaire surveys**

In practice, the Dutch measurements only include parts of the theoretically defined black economy, namely income from work, inasmuch as researchers consider it too difficult to measure hidden income from other sources, e.g. turnover that bypasses the cash register. However, using another method, Kazemier (1991) has measured tax evasion with regard to interest income.

Kazemier and Van Eck consider their measurements of regular or intermittent black activities to be fairly precise, since this kind of work takes up such a large part of daily activities that respondents are expected to be able to give relatively precise answers to the questions about the time used. Moreover, point out the two researchers, black activity is widely accepted, since a lot of people have first-hand experience of it, either as suppliers or buyers. They also think that a lot of people are willing to talk about black activities, because they know that it is extremely difficult for the tax authorities to trace.

In general, however, the two authors do not measure black income such as turnover that bypasses the cash register, since they do not consider it feasible to measure black income for the self-employed – partly because there will not be many self-employed persons in a normal sample and partly because they think that the resistance to answering questions on black income would be too high in this group.

Since the Dutch surveys only include black income from work, they also disregard black transactions. These are included in the Danish surveys, on the other hand. Examples of such transactions are a farmer who sells a pig or cow on the side, or black purchases and sales of antiques, cosmetics, etc. Another example is employees who buy the firm's products cheap and sell them to others. These examples are all taken from answers to the Danish questions about the type of black activities carried out.

The Dutch definition of the black economy also excludes black activities where payment is in the form of a quid pro quo rather than cash. One example of this is a person who lets a neighbour or friend use his weekend cottage and receives payment in the form of repairs to his car. In Denmark, relatively large proportion of all black activities is of this kind. In the latest Danish surveys, quid pro quos constitute about 65% of total black activities.

### 6.4.3 Methods and results

A total of 8 different interview surveys of the black economy were carried out in Holland in 1983 and 1984. Kazemier & Van Eck (1992) compare the ability of the various questionnaire methods to collect data about the black economy, namely face-to-face interviews, postal questionnaires and telephone interviews. They also compare the direct and more indirect (cautious) approach to questions on the black economy.

The response rates in the 1983 surveys were between 47-48%, with one as low as 41%. They were a bit lower in the 1984 surveys, namely 42-43%. Item non-response was in the interval 3.5-6%. By comparison, the response rates in the Danish questionnaire surveys on black activities carried out by the Danish National Institute of Social Research and Statistics Denmark are above 65%, with an "item non-response" typically in the interval 0.1-0.5%, cf. Viby Mogensen et al. (1995). The response rates in the Danish questionnaire surveys on the black economy are around the same level as other Danish surveys carried out by the Danish National Institute of Social Research and Statistics Denmark. The Danish surveys thus have a much higher response rate and a considerably lower "item non-response" than the Dutch questionnaire surveys on black activities.

Since they are based on such a relatively low response rate, the results referred to in the following should be interpreted somewhat cautiously. It should also be mentioned that Van Eck & Kazemier (1992) have carried out a "sensitivity analysis" to try to evaluate what the relatively large non-response means for the frequency of black activities. They therefore assumed that the frequency of black activities was twice as high among non-respondents and that the number of hours worked was four times as high as among those interviewed. According to Van Eck & Kazemier (1992), these extreme assumptions will not affect the frequency of black activities all that much, though it will affect the number of hours worked in the black economy. Van Eck & Kazemier (1992) do not give figures for the effect of these assumptions on the frequency of black activities and the average number of hours worked in the black economy.

Van Eck & Kazemier's (1988) results are based on the most "effective method of inquiry", by which is meant the study which gives the highest number for black activities and the largest extent of the black economy. Their reason for choosing this method is that there is probably a fair degree of under-reporting in a questionnaire survey on black activities, and the higher the frequency of black activities the less under-reporting can be expected. According to Kazemier & Van Eck (1992), the method which produced the highest frequencies for black activities and the highest earnings for black activities was a face-to-face interview where the interviewer approached the subject in a roundabout way. The authors (Kazemier & Van Eck, 1992) also say that a necessary prerequisite for a

very direct question design, such as that currently used in the Danish surveys, is that the questions on black activities are not very sensitive for the majority of respondents.

Just under 12% of all persons over the age of 16 said that they had engaged in black activities in 1983, which corresponds to 100,000 full-time jobs. This constitutes 1% of the national product, which is more or less 1% of GDP, cf. the Statistical Yearbook of the Netherlands (1986, p.275).

It is not altogether clear how the authors have obtained this figure, though they have probably calculated it by multiplying the number of hours worked in the black economy by average black hourly wage. This figure can be compared with the corresponding Danish figure for 1997 of 0.8-1.4% of GDP (see the discussion in chapter 5 on the valuation of black activities). If black prices in Holland are 50-65% below prices in the formal market, as is probably the case in Denmark, the extent of black activities in formal market prices would then be 2-3% of GDP.<sup>32</sup>

On average, a person earns NLG 2,300 (approximately DKK 7,374) a year, which is about a tenth of the income from a full-time job. Based on Van Eck & Kazemier (1988), it can be estimated that a person who had engaged in black activities does so on average 136 hours a year. Kazemier & Van Eck (1992) give a figure for average hourly wage of NLG 15, corresponding to about DKK 48.<sup>33</sup>

According to Van Eck & Kazemier (1988, 1992), black hourly wage vary for different groups of buyers of black work. The average hourly wage for black activities for family and friends is NLG 14. This rises to NLG 27 for black activities for an employer or colleagues at work. Renooy (1990) refers to the same results from another article by Van Eck & Kazemier, though his figures are more detailed. Thus, for black work carried out for the family, hourly wage are typically low, averaging only NLG 10. This rises to NLG 14 for friends, and further to NLG 20 for colleagues. The highest average hourly wage is for black activities carried out for an employer (NLG 33). It can thus be concluded from Van Eck & Kazemier's analyses that the more businesslike the relationship between buyer and seller of black work, the higher the hourly wage.

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<sup>32</sup> This is not a wholly unrealistic assumption, inasmuch as total taxes and duties amounted to 45.5% of GDP in 1984, compared with 48% in Denmark in the same year, cf. Statistics Denmark (1987, p. 150).

<sup>33</sup> The average time spent on black activities is calculated on the basis of table 2 in Van Eck & Kazemier. In converting to DKK, the average annual exchange rate has been used, cf. Statistical 10-year digest, 1994, p. 128.

It can be mentioned in this connection that, according to Renooy (1990), Van Eck & Kazemier found that 51% of all black activities was found through acquaintances and 17% through the family. It can thus be concluded that, in Holland, black activities are not carried out in an anonymous market, but depend to a large extent on who knows whom. The possibility of carrying out black activities thus depends a lot on social relations.

Van Eck & Kazemier (1988) have also asked about the ethical aspects, namely in the form of how serious people view black activities compared with nine other activities. It turned out that black activity is not seen as particularly odious, being regarded as no worse than cycling at night without lights. Hit-and-run driving was seen as the most serious, followed by heroin addiction.<sup>34</sup>

Viby Mogensen (1990) cites a similar study carried out by Observa (a market research institute) and Jyllands-Posten (a national daily) on Danes' attitudes to black activities compared with other activities. Out of a total of 33 activities, with the most unethical at the top (drunken driving), black activities came in at number 22, at the same level as skiving off work. A newer and more concise study (Gallup, a market research institute, and Berlingske Tidende, a national daily, 31/12-94) found similar results. Neither in Holland nor Denmark black activity is regarded as morally wrong.

Van Eck & Kazemier use a number of different variables to explain who carries out black activities in Holland. These are divided into three categories: 1) motives for black activities; 2) opportunities for black activities; and 3) personal information such as sex, age and income, etc. The analysis is carried out by means of a logistic regression analysis, the dependent variable being binary (whether the respondent has been engaged in black activities or not). In addition to this, Van Eck & Kazemier have also estimated a black labour supply function and a black earnings function.

The logistic regression analysis shows that men are more likely to be engaged in black activities than women. Unlike in the Danish, Norwegian and Swedish analyses, the probability of black activities increases with age up to a certain point, after which it falls. The authors have not included a separate occupational variable in the analyses, though they have investigated whether students are engaged in black activities more than others. And the probability of black activity does actually appear to be higher for students than for other groups. Many of the Danish studies found a similar result (see, for example, Viby Mogensen et al., 1995).

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<sup>34</sup> The other activities were pickpocketing, social fraud, squatting, selling pornography, parking illegally and demonstrating.

Among the variables that indicate possibilities of black activities, education is significant. Thus, well-educated people are more likely to be engaged in black activities than those with little formal education. Moreover, the more experience a person has in his/her job, the greater the likelihood of being engaged in black activities. This variable is correlated to some extent with the age variable.

With regard to the motives for black activities, as expected, if people think there is little risk of being caught, they are more likely to be engaged in black activities. And, not surprisingly, people who see nothing wrong with black activities are also more likely to be engaged in black activities.

Taxation can also be seen as a “motive”. Van Eck & Kazemier (1988) have estimated a marginal tax rate and used this as a grouped variable in the analysis. Recipients of social transfers are thus more likely to be engaged in black activities if marginal taxes are high – though the Dutch questionnaire survey shows that respondents have no precise idea of what their marginal tax is. According to Van Eck & Kazemier (1988), the expected marginal tax (minus social transfers) differs by more than 10 percentage points for more than half the respondents.

The Danish 1993/94 survey (cf. Pedersen and Smith, 1995) both asked about expected marginal tax and estimated marginal tax based on income records. A comparison of the expected marginal tax, obtained from a question in the questionnaire, with the estimated marginal tax shows that, for over 66% of respondents, the difference between the estimated marginal tax and the expected marginal tax is less than 10 percentage points. And for half the respondents, the difference is less than 6 percentage points.<sup>35</sup> Thus, as Pedersen & Smith (1995) also conclude, Danes appear to have a fairly good idea of what their marginal tax is, and, apparently, a more precise idea than the Dutch.

As mentioned previously, a lot of interest in the international literature has centred on the question of whether the unemployed or persons on social security are engaged in black activities more than other groups. The hypothesis is that a person whose income is reduced because of unemployment has a strong incentive to increase his income. However, it has not been possible to demonstrate such a connection in the Dutch data, nor in the Danish data for that matter. Van Eck & Kazemier explain this by the fact that unemployment benefit and other social transfers are relatively high in Holland, so there is not such a big incentive to be engaged in black activities.

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<sup>35</sup> Pedersen & Smith (1995) have included both expected and estimated marginal tax as explanatory variables. Neither appear to have a significant effect on whether a respondent carries out black activities or not.

The above-mentioned analyses have identified which groups are active in the black markets. It remains to be shown how much time is spent on black activities and how much black income is earned.

To help answer this, Van Eck & Kazemier have estimated a function for black earnings. This has been done by means of a regression analysis, using wages as the dependent variable and various explanatory variables, including whether the respondent has carried out black work for the family, close friends, or for colleagues or employers. The calculation of this function confirms the above-mentioned result that black earnings are more than 1½ times higher in the case of black activities for colleagues or employers. The higher the educational level and the higher the income in the formal economy, the higher the black earnings. Black earnings are higher in towns than in the country. Finally, both students and the elderly have lower black earnings than the other groups who work in the black market. Van Eck & Kazemier thus conclude that the same explanatory variables determine earnings in the black sector as in the formal sector. In this respect, therefore, the Dutch results strongly support the Danish view (see chapter 1) that an appropriate definition of the black sector should reflect the fact that it is a market like any other.

Somewhat surprisingly, perhaps, the estimation of the supply of black labour shows that the higher the black hourly wage, the fewer hours are spent on black activities. According to Van Eck & Kazemier, this is because the marginal utility of leisure time seems to be higher for people with high black earnings. People who have high black earnings also work relatively more in the formal economy, cf. above, and thus have less leisure time, which they therefore appreciate all the more.

It can be seen from Van Eck & Kazemier's labour supply function that women are engaged in black activities more hours than men. Pedersen & Smith (1995) found the opposite result for Denmark, though here black hourly wage was not included as an explanatory variable.

Van Eck & Kazemier also investigate whether the black market functions as a kind of "buffer" for the formal economy. Does a recession in the formal economy force people on unemployment benefit or social security to work in the black economy in order to supplement their income – and does economic growth mean that people move from the black economy to the formal economy?

In all, Van Eck & Kazemier examine six different groups, broken down by sex, work experience and education, which reflect the possibilities in the formal market. It turns out that the estimated black incomes fall with falling job experi-

ence and educational level. Furthermore, men earn more than women in the black markets. Comparing these results with the result of the logistic regression analysis above, which showed that the unemployed do not engage in black activities more than other groups, Van Eck & Kazemier conclude that people with limited possibilities in the formal market do *not* supplement their income by black activities. On the contrary, it is more people who are successful in the formal market who supplement their income by working in the black market: the structure of the labour market is a much better explanation for black activities than periodic fluctuations in the economy.

As mentioned above, one possible reason why the unemployed or social security recipients do not engage in black activities to any great extent could be that unemployment benefit and other transfer income is relatively high in Holland, thus reducing the incentive to be engaged in black activities. Renooy (1990) supplements this by observing that a person's social network and acquaintances are crucial to being able to be engaged in black activities at all. Thus, if a person gets laid off or receives other transfer income, he/she loses an important contact, via the workplace, to the black markets. Pahl (1987) finds similar results for the Isle of Sheppey in England. Pahl has been unable to demonstrate that the loss of formal work is substituted by black activities. Contact to the formal workplace enables people to exchange black work, and to borrow tools, etc., so that they can carry out black activities. The OECD has also been unable to find a connection between black activities and unemployment. The OECD (1986) thus concludes that, for most countries, there is little to indicate that black activities are particularly important as a supplement to income for the unemployed.

#### **6.4.4 Tax evasion on interest income in Holland**

As can be seen from the above, Kazemier & Van Eck's analyses of black activities did not include tax evasion on, for example, interest income, since they considered it too problematical to ask about, respondents probably not being able to remember how much interest they earn over a whole year.

Kazemier (1991) has used a completely different method to investigate the extent of tax evasion on interest income, though in common with the questionnaire surveys in this chapter, data is collected on an individual level and based on random samples. This work is therefore also relevant to the discussion here and is briefly described below.

The method is based on differences between the national accounts estimates of households' total interest income on the one hand, and the tax authorities' information about households' payment of tax on interest income on the other. In the Dutch national accounts, total household interest income is based on information from the central bank, banks, giro account balances, pension funds, etc. The tax authorities' information comes from tax returns.

Kazemier carried out his analysis on a representative study of tax evasion on interest income. This study, which involved about 3000 taxpayers, compared the information about interest income which they disclosed to the tax authorities with the same persons' balances in bank and giro accounts.<sup>36</sup> The results of this micro-analysis were then compared with the results of Kazemier's own macro-analysis. This showed that the two sets of results did not differ much from each other (see also below).

Based on the macro-figures, Kazemier estimates that tax evasion on interest income amounted to 1.2% of GNP in 1977, rising to 1.9% of GNP in 1981, corresponding to 1.9% of GDP, cf. Holland's central bureau of statistics (1986, p. 275), and is thus at least as high as, if not higher than, the level for black activities. It should be mentioned here that, according to Kazemier (1991), the figures for the extent of tax evasion on interest income are probably underestimated, since the method used cannot take account of all reservations and differences in data. He has therefore selected those figures which do not overestimate the extent of tax evasion. It appears that the degree of tax evasion varies a lot according to the type of interest income in question. With regard to interest income on giro, bank and savings accounts, tax evasion constitutes about 30-35% of the total interest income on these accounts, compared with 70% for the total interest income from shares.

According to the micro-analysis of tax evasion on interest income, 6% of all taxpayers concealed interest income from the tax authorities in 1981. But more than 60% of taxpayers who had interest income concealed part or all of this income from the tax authorities. Converted to the population as a whole, this corresponds to just under 1.7 million Dutchmen who evade tax on interest income. It should be noted, however, that not all interest income is subject to tax. In 1981, only where interest income exceeded income expenditure by more than NLG 700 (about DKK 2244) was it subject to tax. It is therefore not people with inconsiderable interest income who cheat the tax authorities.

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<sup>36</sup> The Dutch parliament passed a law which guaranteed the 3000 selected taxpayers anonymity, and which obliged the banks to provide information about these taxpayers' bank balances. This made the comparison possible.

As mentioned above, the comparison of the micro- and macro-analyses showed that the results of the two methods were surprisingly similar. For example, the micro-analysis estimated balances in banks, giro accounts and savings accounts to amount to NLG 8.1 bn in 1981. Based on the macro-analysis, Kazemier reached a figure of NLG 8.5 bn. The estimated disclosed interest income was about NLG 5.7 bn in the micro-analysis and about NLG 5.5 bn in the macro-analysis. As Kazemier points out, it gives added credence when two such different methods give almost the same result.

It is worth noting that, in Denmark, this form of tax evasion became practically impossible after Jan. 1, 1978, when tax control was expanded so that banks were required to report all interest payments or crediting of accounts to the tax authorities, cf. Stubkjær (1978).

#### **6.4.5 Closing remarks**

The theoretical definition of the black economy in Holland corresponds to the Danish definition in chapter 1. As regards the definition used in practice, the Dutch definition is close to the Danish definition of black activities. However, Van Eck & Kazemier's (1988) definition does not include black transactions and black activities where payment is in the form of a *quid pro quo*.

Black activities account for 1% of GDP in black market prices, or 2-3% of GDP in formal market prices. To this can be added tax evasion on interest income of about 1.9% of GDP, if the level is unchanged in 1983/84 compared with 1981. This brings the extent of the shadow economy in Holland to 4-5% of GDP, which is around the level in Denmark in the 1980s, or possibly somewhat below, due to technical differences in the measurements, cf. above. Thus, there are no great differences in the level of black activities and tax evasion between the two countries, which also have a lot in common in other areas.

There are also many similarities in the structure of the black market in Holland and Denmark. In both countries, it is especially men who are engaged in black activities. And in neither Holland nor Denmark is there much to indicate that the unemployed and people on other transfer income are engaged in black activities more than the rest of the population. One possible reason for this is that the level of transfer income in the two countries is relatively high, which reduces the incentive to be engaged in black activities. Another possible explanation is that the unemployed and other social security recipients do not have such a big social network as, for example, a workplace gives, which means fewer possible contacts to the black market. In both countries, contact to friends, acquaintances and colleagues is thus important for the possibility of being engaged in black activities.

In Holland, as in Denmark, students are very active in the black markets. However, the probability of being engaged in black activities increases with age in Holland, whereas it falls in Denmark.

Finally, black activity is not regarded as particularly morally wrong in either country. In Holland it is viewed on the same level as cycling after dark without lights, while in Denmark it is regarded as no more serious than skiving off work.

## **6.5 Germany**

Most German research on the shadow economy takes a starting point in macroeconomic methods, such as monetary methods, cf. chapter 3. This applies to, for example, Kirchgässner (1983) and Langfelt (1989), while Petersen (1981) has examined differences in the national accounts.<sup>37</sup>

As regards the microeconomic analyses of the shadow economy, the only reasonably satisfactory questionnaire survey based on a random sample of the West German population was carried out in 1984. The results of this have been published in, among others, Wolff (1990, 1991) and Merz & Wolff (1993).

Several other larger or smaller surveys of the black economy had been carried out up to 1984, but these were either not representative or there was a lot of uncertainty as to whether the questions used actually covered black activities, cf. Wolff (1991). This applies to a frequently cited study by "Institut für Demoskopie Allensbach: Freizeitarbeit 1974", cf. also Smith & Wied Nebbeling (1986). Here, therefore, only the representative survey from 1984 will be referred to.<sup>38</sup> The following is therefore mainly based on Wolff (1990, 1991) and Merz & Wolff (1993).

### **6.5.1 Definition of the black economy in the German questionnaire survey**

Wolff (1990, 1991) and Merz & Wolff (1993) define "Schwarzarbeit" or "illicit work" as those cases where no tax and/or social contributions are paid on earned income. Their definition of black activities is thus quite close to the Danish definition of black activities in a narrow sense, cf. chapter 1. However, Wolff's (1991) and Merz & Wolff's (1993) term also covers those cases where only the one party knows that no tax and/or social contributions are paid. In Danish terminology, this is called ordinary tax evasion.

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<sup>37</sup> See Wolff (1991) and Schneider (1994) for a review of the various macroeconomic studies of the informal economy in Germany.

<sup>38</sup> See Wolff (1991) for a review of the other German micro-surveys of black activities.

Neither the German nor Danish definitions of black activities include, for example, claiming too-high deductions, thereby saving tax. This is called tax evasion in the Danish definition. In practice, however, this is not even measured in the German questionnaire survey, which asks specifically about sideline employment, cf. below.<sup>39</sup>

### **6.5.2 Methods and results**

The 1984 survey involved a total number of 7,826 interviews (carried out by the firm MARPLAN, Offenbach) among persons aged 14 and over in private households. This corresponds to a response rate of 70, cf. Helberger, Merz & Schneider (1985). The response rate is thus the same as in the Danish surveys, and considerably above the Dutch level.

The data about black activities is obtained indirectly. It was not considered possible to ask about black activities directly, since it is a sensitive issue. Information about black activities is therefore obtained by asking whether respondents have had work in addition to their main job within the last three months. Like the Danish surveys, all respondents are asked, i.e. also persons without actual employment, such as students and pensioners. If the interviewees reply yes to this question, they are then asked about a number of expenditures in connection with this other job, including whether they pay tax and social contributions. If they do not pay either tax or social contributions, they are asked whether, under present rules, they have to. If the interviewee is supposed to pay tax and social contributions, but does not, it is defined as black activity. As can be seen from the above, respondents are asked about paid sideline employment – friendly turns and *quid pro quos*, i.e. services paid in kind, are thus excluded.

Wolff (1991) employs both an upper and a lower limit for black activities. The upper limit is defined as cases where a person has a sideline, but does not pay tax or social contributions. This ignores the fact that, under present rules, the person might not have to.

The lower limit is defined as cases where the respondent is supposed to pay tax or social contributions, but does not. More than 8% had engaged in black activities measured by the upper limit, while just over 4% had engaged in black activities measured by the lower limit.

In 1984, 4.4-8.3% of the adult population over 14 had engaged in black activities in the last three months. Wolff's (1991) figures for black activities differ

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<sup>39</sup> For the sake of completeness, it should be mentioned that Merz & Wolff (1993) also explicitly analyse DIY work – using a definition of DIY work close to that of Viby Mogenssen (1990c) and Brodersen (1995, 1997).

slightly from Wolff's (1990) and Merz & Wolff's (1993), due to differences in the definition of the population.

The 4.4% of the population who, according to the lower limit measure, had engaged in black activities in Germany in 1984, spent an average 6.1 hours a week on black activities, cf. Merz & Wolff (1993). According to the upper limit measure, the black weekly average was 5.4 hours, cf. Wolff (1991).

Based on the total number of hours worked in the black economy multiplied by average black hourly wage, and using the lower limit measure, Wolff (1991) has calculated that the black economy accounted for 0.6-1% of GDP in 1984. The corresponding figure using the upper limit measure is 0.9-1.2% of GDP.

However, this interval of 0.6-1.2% of GDP is not directly comparable with the Danish figures for the size of the black economy for at least three reasons.

First, as previously mentioned, the word black activity does not appear at all in the question design, so the interviewers are not aware that this is what is being measured. Similarly, some respondents dropped out from the start, since they had no idea that they were being asked about black activities. The Danish surveys employ a much more direct approach to black activity, where respondents are reminded several times that they are now being asked about black activities and work concealed from the tax authorities.

Second, as mentioned above, the question design leads people's thoughts to the cash part of black activities, so the payment in kind part is ignored completely. And third, the German survey only asks about the last three months, whereas the Danish surveys ask about the last 12 months.<sup>40</sup> This will obviously give a lower black frequency than in the Danish surveys.

The 0.6-1.2% of GDP is in black market prices, of course. If we assume that black market prices are half formal market prices, black activities would account for 1.2-2.4% of GDP measured in formal market prices. That it is not assumed – as is the case for Norway and Holland – that black prices lie 50-65% under formal market prices is due to the fact that taxation in Germany in 1984 was “only” 37.7% of GDP, against 48% in Denmark, cf. Statistics Denmark (1987, p.150).

In view of the above-mentioned differences in measurement methods, and especially in the period of measurement, therefore, it is not unreasonable to assume

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<sup>40</sup> The survey was carried out over four quarters, with about 2000 interviews per quarter.

that, if the definitions had been identical, the scale of black activities in Germany would be the same as in Denmark in the mid-1980s, i.e. 4-6% of GDP.

And considering that (as mentioned in chapter 3) the macroeconomic methods arrived at a figure for the shadow economy in Germany at this time of between 5-13% of GDP, it is not inconceivable that the scale of black activities is even higher. Klaus F. Zimmermann, a German labour market expert, based his (1993) contribution to the Rockwool Foundation's study of *Welfare and Work Incentives. A North European Perspective* on precisely the assumption of a share of GDP in almost the same interval, i.e. above the level in the questionnaire survey.

Wolff (1991) contains both a descriptive and a statistical analysis of those variables which determine whether a person offers his/her labour to the black markets.

The descriptive part of the study shows that somewhat more men than women had engaged in black activities, namely 5.7% of men as opposed to 3.3% of women. On the other hand, women work more hours in the black market than men, namely 8.3 hours a week against 4.5 hours a week for men.

6% of the under-21s had engaged in black activities. This rises to 7% for the 21-30-year-olds, after which it falls with age, e.g. 4.6% for the 31-40-year-olds and 3-8% for the 41-50-year-olds.

Broken down by occupation, persons under education (both practical and academic) and those without jobs are especially active in the black markets. Among persons with a main occupation, labourers in particular had engaged a lot in black activities.

Wolff (1991) has also examined the different types of black activities. Among men, black activity is especially common within the trades. Thus, 30% of all black activities carried out by men occurs in this sector.<sup>41</sup> For both men and women, just under 19% of all black activity is carried out within the trades. Wolff (1991) has isolated construction from the trades and finds that 12% of all black activity is carried out within construction.

Together, the trades and construction thus account for over 30% of all black activities, which is the same level as in Denmark (see, for example, Viby Mogenssen et al., 1995). Women had engaged in black activities especially within

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<sup>41</sup> Calculated on the basis of table 4.8 and figure 4.1 in Wolff (1991).

the cleaning and caring sectors. Thus, cleaning accounts for just under 19% of all black activities carried out by women and caring for just over 16%.

The detailed statistical analysis in Wolff (1990, 1991) of the factors that determine whether a person is active in the black markets confirm the aforementioned results for the variables sex, age and occupation. As far as the unemployed are concerned, however, it is worth noting that, in Merz & Wolff (1993), the unemployed are not significantly more likely to be engaged in black activities than others, nor do they, measured by time use, work significantly more.

Wolff (1990, 1991) and Merz & Wolff (1993) have also investigated whether activities in unpaid social networks influence the extent to which people engage in black activities. It might be expected that such activities would reduce the time available for black activities. However, the analyses show that the variables help to neighbours, help to families/friends and unpaid honorary positions are all significant. The authors' explanation for this is that activities in these social networks are a way of coming into contact with potential "customers". A similar result was found in the Dutch studies. Thus, according to Van Eck & Kazemier (1988), one possible explanation of why the unemployed in Holland do not engage in black activities more than others is that people who become unemployed lose touch with the network they have built up at their workplace. Smith & Wied-Nebbeling (1986) also mention this, adding that the unemployed do not have the same possibilities for borrowing tools, and perhaps also a workshop, etc., as a person in employment.

It should also be mentioned that Wolff (1990, 1991) and Merz & Wolff (1993) have included various variables to measure regional economic differences. These include paid taxes per inhabitant, the proportion of the long-term unemployed (unemployed for more than one year) in relation to all unemployed, and the number of persons employed in the service sector. The result of the analysis shows that a person is more likely to be engaged in black activities in regions where the economy is thriving. For example, black activity is less likely in regions with a high proportion of long-term unemployment. Using other variables and another method, Van Eck & Kazemier (1988) have obtained a result for Holland not too unlike the German result. Van Eck & Kazemier concluded that, to a large degree, it is the same factor that determines the supply of labour in both the formal and black sectors.

Finally, a person who lives in the country is more likely to be engaged in black activities than one who lives in a town or city. There is also some seasonal variation. Thus, black activity is significantly more likely in the spring and autumn than in the winter.

As mentioned above, Wolff (1990, 1991) has also estimated a black hourly wage function. Taking a number of background variables into consideration, the estimation of the black wage function shows that men have considerably higher hourly wage than women. Wolff's explanation for this is that men have more human capital in the form of longer job experience from the formal part of the economy. Wages rise with age for men, though the rate of increase slows.

For women, on the other hand, wages fall with age. According to Wolff, the black labour market thus reflects the formal. As regards occupation, male skilled workers, apprentices, students and lower-level public servants have significantly higher hourly wage than other occupational groups. The opposite is the case for women, with students, pensioners and lower-level public servants having significantly lower hourly wage than the reference group (lower white-collar workers).

For men, the aforementioned activities in social networks means significantly higher hourly wage if the activity is of the honorary office kind. For women, help to neighbours means significantly higher hourly wage.

Kinds of black activities are also included in the black wage function. For men who had engaged in black activities within horticulture, agriculture, transportation and other skilled trades, hourly wage are significantly lower, while they are higher in commerce. The highest black hourly wages for women, on the other hand, are in teaching and commerce.

As regards the regional variable, hourly wages are markedly higher in towns than in the country, for both men and women. According to Wolff, this is because black wages in smaller units, e.g. a village, are the result of closer social contacts. Conversely, social contact is not as close in towns, which thus results in higher hourly wages.

As far as seasonal variation is concerned, Wolff shows that black hourly wages are significantly higher in spring, summer and autumn than in winter.

### **6.5.3 Closing remarks**

The German study defines "schwarzarbeit" as those cases where tax and/or social contributions are not paid on earned income. This definition is relatively close to the Danish definition of black activities. However, the German definition also includes those cases where only the one party knows that tax and/or social contributions are not paid. This is called ordinary tax evasion in Danish terminology.

As in Denmark, Norway and Holland, more men than women had engaged in black activities. On the other hand, in Germany women work more hours in the black economy than men. This is the same as in Holland, though the opposite to Denmark. In Germany, black activities increase with age up to a certain point, after which it falls, as is the case in Holland. In Denmark, Norway and Sweden, the reverse is true: black activities fall with age.

As far as the distribution of black activities by industry is concerned, trades and construction account for 30% of all black activities in Germany, which is the same as in Denmark and Norway.

As in the Dutch, Norwegian and Danish surveys, a number of indicators show that the unemployed do not engage in black activities more than other sections of the population. This is possibly due to the fact that the unemployed have a more limited contact network than those in work. The German study also observes that, by virtue of employment, people have access to tools and possibly also a workshop, which makes it easier to carry out black activities. This is a possibility the unemployed do not have.

All in all, between 4.4% and 8.3% of the adult German population had engaged in black activities in 1984. According to the German study, black activities accounted for between 0.6% and 1.2% of GDP. This is not directly comparable to the Danish figure for the black economy, however, for three reasons.

First, the German survey employs an indirect interview technique, where the words black activities and tax evasion are not even mentioned. Second, one consequence of the interview technique is that black activities paid for in kind are not included in the study at all. Third, respondents are only asked about the last three months.

It would therefore not be unreasonable to assume that the extent of black activities in Germany is at the same level as in Denmark in the mid-1980s, i.e. corresponding to 4-6% of GDP. It could conceivably be even higher, inasmuch as the macroeconomic methods (see chapter 3) gave a figure for the shadow economy in Germany in this period of 5-13% of GDP.

## **6.6 Spain**

During the 1980s, Spain had one of the highest unemployment rates in the EU. There was over 20% unemployment in the mid-1980s, compared with an EU average of just over 10%. Since then, unemployment in Spain has followed the same trend as in the rest of the EU, though it is still at a significantly higher level, cf. Blanchard et al., (1995).

One of the main causes of the high unemployment in Spain was the fight against inflation from the end of the 1970s, cf. Blanchard et al., (1995). But economists began to wonder why Spain continued to have a so much higher unemployment than the rest of the EU, and the suspicion grew that the black economy was bigger than at first assumed. Both Blanchard et al., (1995) and Franks (1994) include a discussion of the extent to which the black economy affects the official unemployment statistics. The government also believed that the official statistics overestimated unemployment, due to the presence of a considerable black economy, cf. Ahn & De la Rica (1997).

This led the Spanish Ministry of Economic Affairs to initiate a very extensive questionnaire survey, the aim of which was to obtain more accurate figures for unemployment and at the same time measure whether respondents had been active in the black economy.

The surveys concerning the black economy are published in Ahn & De la Rica (1997) and De la Rica & Lemieux (1994), which are the main sources for this section on Spain. Before turning to the actual survey and its results, a brief account of the background of the shadow economy in Spain will be given, since Spanish conditions are rather different than the other countries discussed in this book.

#### **6.6.1 Background of the black economy in Spain<sup>42</sup>**

Under the Franco dictatorship up to 1975, wages were set by the State, and wage earners were denied the right to form trade unions. Generally speaking, the Spanish labour market was tightly regulated by the State, and, according to Benton (1990), this, together with low wages, meant that there was no shadow economy to speak of before the end of the 1960s and beginning of the 1970s.

The tightly regulated Spanish labour market resulted in low wages up to the 1970s. Around that time, however, the increasing opposition of wage earners, among other things in the form of strikes, gradually led to rising wages, and the government increased unemployment benefit to keep workers pacified. The higher unemployment benefit was financed by increased taxes on employers.

During the transition to democracy after Franco's death in 1975, trade unions with the right of collective bargaining were allowed. The unions won real wage increases of 8.2% a year in the period 1973-79. Some regard such large increases in direct and indirect wage costs in so short a time as an explanation for the growth of the black economy, cf. Benton (1990, p. 31).

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<sup>42</sup> This section is based on Ahn & De la Rica (1997). See also De la Rica & Lemieux (1994).

But rising wages also led to an increase in unemployment, from 5.8% in the period 1974-79 to 17.4% in 1980-85. In addition, it was extremely costly for firms to fire their employees. The unemployed thus became an attractive source of labour for firms which already operated in the black economy, or which operated in the formal economy but wanted to keep wage costs down.

In addition to these structural conditions, legislation has also made it more attractive for firms to operate in the black economy – the authorities relaxed control and the consequences of violating the law were moderate. Official attitudes to the black economy, also within the government, were quite relaxed. De la Rica & Lemieux (1994) thus quotes the Spanish Minister of Labour in 1984 as having said: “...necessary to try to accept the underground economy because it reflects the inadequacy of the laws”. He also described the underground economy as a “minor evil”.

### **6.6.2 Definition of the black economy in the Spanish study**

Ahn & De la Rica (1997) limit the population in their study to persons in the 16-65 age group. In 1985, interviews with 39,494 persons were carried out in this group.

First, each person was asked whether he/she had a social security card, which all persons with a job must have. It is employers' responsibility to ensure that wage earners join the welfare system – and thus obtain a social security card – when they are employed. This is required within five days of starting a job. Those persons who answer no to this question (and who also have a job) are assumed to work in the black economy. Those persons who say that they have a social security card are then asked whether they pay social contributions, since it is possible both to have a social security card and *not* pay tax, cf. De la Rica & Lemieux (1994, p. 279). Those who answer no to this question are also assumed to be active in the black economy.

Wage earners cannot use the health service or receive sickness benefit without a social security card. For married couples where both spouses work, two social contributions must be paid. However, since, under the Spanish system, one of the spouses – like other close family members – is already covered by the other's social security card, there is little incentive to pay two contributions.

A firm also benefits from employing workers who neither pay social contributions nor have a social security card. In fact, according to De la Rica & Lemieux (1994), the firm benefits most, since employers' share of social contributions is 24% of earnings, whereas wage earners' only pay 4.8%.

Furthermore – and perhaps somewhat more seriously – the study cannot identify persons who both work in the formal economy (and who therefore have a social security card) and also engage in black activities. These persons will be regarded as belonging solely to the formal economy. This underestimates the proportion of people who engage in black activities, and thus also the size of the black economy.<sup>43</sup>

### **6.6.3 Results**

According to the above-mentioned questionnaire survey carried out by the Ministry of Economic Affairs, 10.6% of the Spanish population in the 16-65 age group worked in the black economy in 1985 – 9.6% of men and 11.2% of women.

As emphasised in De la Rica & Lemieux (1994), these figures must be seen as minimum figures for black activities, since it is highly unlikely that everybody had answered the question about social contributions honestly. Here, De la Rica & Lemieux (1994) refer to a Canadian study which showed that, even in anonymous research projects, only about 65% of income from the black economy was reported, cf. Lemieux et al. (1994) – see also Viby Mogensen et al. (1995, p. 29).

By comparison, 13.4% of Danes had engaged in black activities in 1984, cf. Viby Mogensen (1985). It is worth noting, however, that the 10.6% of the Spanish population who had engaged in black activities do so full time. This is not mentioned in the article, but has been reported to the Rockwool Foundation's Research Unit in a private correspondence.<sup>44</sup> According to this information, it can be assumed that 90% of those who had engaged in black activities do so on a full-time basis, i.e. 40 hours a week, while the remaining 10% had engaged in black activities at most 26 hours a week.<sup>45</sup> This distribution is identical to that in the formal part of the economy, cf. above.

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<sup>43</sup> However, Ahn & De la Rica (1997) do not think that the number of persons who work in both sectors is very large, inasmuch as about 10% work part-time. If a person has both a full-time job in the formal economy and a second job in the black sector, the latter, if it is registered at all, will be registered as a part-time job, since it is less than full time. According to Ahn & De la Rica (1997), 10% of wage earners at most have a full-time job and carries out black activities at the same time.

<sup>44</sup> Cf. e-mail from Sara de la Rica, Jan. 8, 1997.

<sup>45</sup> The survey did not specifically ask how many hours a week people worked, either in the formal or informal economy. Rather, respondents were asked whether they worked full time or part-time, and they were to regard work as part-time if it was less than 2/3 of 40 hours a week.

The Spanish studies also show that the proportion of persons who work in the black sector falls with age. Thus, 45.7% in the 16-20 age group work in the black sector, but only 18.6% of the 21-25-year-olds and a tiny 4.1% of the 51-55-year-olds. The pattern is the same in Denmark.

Earnings in the black sector are, on average, a lot lower than in the formal economy, being about 43% under average net earnings. Persons with a university education have the highest black monthly earnings. In families, it is the head of the family who has the highest black monthly earnings.

Unfortunately, Ahn & De la Rica (1997) do not include figures for black activities broken down by occupational groups or industry. Benton (1990) does, on the other hand, and also refers to figures for the same questionnaire survey that Ahn & De la Rica (1997) analyse. However, it is rather difficult to compare the results referred to in Benton (1990) with those in Ahn & De la Rica (1997), since Benton compares the proportion who work in the black sector with total employment without giving a figure for the actual number of persons involved. According to Benton (1990), 25.1% of all employed persons work in the black sector, with a figure of 33.1% for the self-employed and 18.8% for wage earners.<sup>46</sup> Broken down by industry, black activity is especially pronounced in agriculture, where 42.1% of employees had engaged in black activities, while the figure for trade, the hotel industry and car repairs is 38.9%, and for other service industries 28.1%. In the construction industry, just under 20% of employees had engaged in black activities.

According to Benton (1990), the relatively high figure for black activities among the self-employed is the result of a reorganisation of production. Thus, many of the self-employed who now engage in black activities were previously wage earners in the formal economy. The reorganisation is due to firms which shut down being replaced by new, smaller firms. Alternatively, the black jobs are created by firms subcontracting parts of production to smaller firms.

Ahn & De la Rica (1997) carry out special statistical tests to try to find out what determines whether a person works in the black sector. They first investigate what determines whether a person chooses to work or not, and then what determines whether that person works in the black sector, given that he/she does not

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<sup>46</sup> As previously mentioned, the 10.6% of the population who carries out black activities represent 10.6% of the whole population, not just the working population. Benton (1990) also appears to differ from Ahn & De la Rica (1997) in other respects, in that she uses a broader definition of black activities: a footnote to the table referred to states that it also includes persons who both receive unemployment benefit and work, together with persons guilty of other irregularities (not specified). Finally, Benton (1990) does not define the population used in her study.

work in the formal sector. This is wholly in accordance with a theoretical model discussed by Ahn & De la Rica (1997) before they present their empirical results.

For women, a higher educational level means a lower likelihood of working in the black sector. Women thus prefer to spend time looking for a job in the formal economy than to carry out black activities. The reverse is true for men: persons with a university education are more likely to be engaged in black activities. This surprised the authors, because their analyses also show that people with a university education are more likely to work in the formal sector. The reason for this is that unemployment was especially high in Spain in 1985, and the highly educated have obviously preferred to work in the black sector than claiming unemployment benefits. Moreover, not many men in the survey with a university education (275) do not work in the formal sector, and the result can therefore be due to unobserved characteristics in this group.

For heads of households, the greater their expectations of earnings in the formal sector, the less likely they are to work in the black sector. The explanation given for this is that, rather than working in the black sector, people prefer to spend more time looking for work in the formal sector.

It also emerges that persons with a father or husband who works in the formal sector are more likely themselves to work in the black sector. This is because in families where one person already pays social contributions, and thus has a social security card – more often than not the head of the household, the man – the other family members are, as mentioned above, also covered. There is therefore no incentive whatsoever for other family members to pay social contributions too. This also explains why there are relatively more women (11.2%) in the black sector in Spain than men (9.6%). Moreover, the probability of black activities increases if other family members work in the formal sector, which is also connected with the above reason.

This incentive structure is also one of the reasons why the young engage in black activities so much – nearly 50% of the 16-20-year-olds – since they probably live at home and are thus already covered by one of their parent's social security cards.

In addition to this questionnaire survey, there are also various qualitative studies of the black economy in Spain, either of particular regions (Sabadell in Catalonia and Andalusia) or particular sectors (e.g. the textile and electronics industries around Madrid), cf. Miguelez (1990). These studies also give percentages for the extent of "black activities", but say nothing about how they have arrived at these results.

Miguelélez also discusses the above-mentioned questionnaire survey carried out by the Spanish Ministry of Economic Affairs in 1985. However, he is critical of the definition of black activities used in the study. For example, in his view (p. 17), black activity also includes a person who has a “social security card” but who does not pay social contributions, though he does not explain this further. It should be mentioned here that both Ahn & De la Rica (1997) and Benton (1990) use the same definition as the Spanish Ministry of Economic Affairs.

Unfortunately, as far as is known, there are no estimations of the extent of black activities in Spain based on this questionnaire survey. However, using the same method on the Spanish figures as in the Danish questionnaire surveys can give a rough estimate.

In the Danish studies (see chapter 5), the number of hours worked in the black economy is related to the number of hours worked in the formal economy. With some caution, the same can be done with the Spanish figures, inasmuch as, according to Sara de la Rica, black activity is a full-time activity in Spain. Based on table 2a and 2b in Ahn & De la Rica (1997), therefore, it can be calculated that 1,493 men and 2,692 women in the survey engage in black activities, out of a working population of 15,529 men and 9,262 women. Since they work equally in the black and formal sectors, the extent of black activities in Spain can now be calculated at 16.9% of GDP.<sup>47</sup> The 16.9% of GDP is measured in formal market prices, of course (cf. the discussion in chapter 5 on the valuation of black activities).

This calculation assumes, as in the Danish calculation, that productivity in the black sector is the same as in the formal sector. However, since black activity is a full-time activity, this condition can also be said to be fulfilled.

Any comparison between Spain and Denmark, where black activities in the mid-1980s accounted for about 3.9% of GDP (cf. Viby Mogensen, 1985), should keep in mind the classic problem of comparing GDP between countries. Thus, the number of hours worked in the formal economy in Spain will be relatively lower than in Denmark, since, for example, much welfare work in Denmark is carried out by the public sector, and is thus included in GDP, while in Spain it is much more a family responsibility, and is not included in the formal economy. Thus, the number of hours in the formal economy in Spain will be lower than in Denmark, which is why the difference in the extent of black activities between the two countries is not quite as big as the above figures might suggest.

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<sup>47</sup>  $(1,493 + 2,692)/(15,529 + 9,262)$ .

Conversely, however, it should be remembered that the figure for black activity in Spain is underestimated, since the Spanish measurements do not include persons who carry out black activities in addition to having a full-time job. This therefore reduces the extent of black activity in Spain. All things considered, therefore, it is not unreasonable to compare the 3.9% of GDP in Denmark with the 16.9% in Spain.

#### **6.6.4 Closing remarks**

While fewer people engage in black activities in Spain than in Denmark, in Spain black activity is a full-time activity. In Denmark, on the other hand, people engage in black activities primarily in spare time, and in addition to having a full-time job. Over 10% of the whole Spanish population had engaged in black activities full time in 1985.

Unfortunately, there are no estimates of the extent of the black economy in relation to GDP based on the major questionnaire survey in 1985. However, using the same extrapolation method as in the Danish studies, cf. chapter 5 above, it can be cautiously estimated that the black economy in Spain accounts for just under 17% of GDP. This is not far from the level of about 18% of GDP in Italy, though this figure is based on differences in the national accounts, cf. chapter 3.

The situation in Spain also differs from that in Denmark in that, according to the Spanish researchers, firms appear to be the main moving force behind the growth of the black sector. Firms have tried to keep labour costs down by not paying social contributions. Firms have also tried to ensure a greater flexibility in the use of labour, since, for example, it is extremely costly to shed workers in the formal economy.

The motivation for the Spanish worker is to save contributions to the health insurance scheme – if, that is, he or she has a spouse or parent who is already covered by virtue of being employed in the formal sector. Under Spanish rules, if one person in the household has a social security card, then all close relatives are covered, so others in the family who engage in black activities have no incentive to pay health insurance too. This also explains why more women than men engage in black activities in Spain.

#### **6.7 Closing remarks on the black economy in Norway, Sweden, Holland, Germany and Spain**

This chapter has looked at the measurement of the shadow economy by means of questionnaire surveys. The focus on this type of measurement is partly due to the fact that the questionnaire method gives a far better insight into the structure of the shadow economy and partly because it facilitates a comparison of the

shadow economy in these countries with that in Denmark, where questionnaire surveys have primarily been used to measure the phenomenon.

The various interview-based questionnaire surveys use more or less similar definitions of the shadow economy. Thus, like the Danish studies, all the surveys include black activities, where both buyer and seller of the activity benefit from non-disclosure to the tax authorities. The German and Danish definitions are especially close, in that these also include black transactions, which are excluded in the Norwegian, Dutch and Spanish studies. In addition to black activities, the shadow economy also consists of ordinary tax evasion, where only the one party benefits in the form of tax and VAT saved, etc.

As regards the actual measurement of the phenomenon, the German study differs from the other countries that have used the questionnaire method in only asking about the last three months, whereas the other countries' surveys ask about activities during the past year. Furthermore, the German study uses an indirect question design, where the words black activities and tax evasion are not even mentioned. The Danish measurement method, on the other hand, differs from the other countries' in that it only focuses on black activities.

Table 6.3 shows that, at the beginning of the 1980s, the shadow economy in Norway accounted for 4-6% of GDP, which corresponds to the Danish level in the same period. The level in Norway rose to around 5-6% of GDP in the 1988/89 study, though using another extrapolation method, which makes a direct comparison with the 1980 and 1983 surveys difficult. Unfortunately, there is no figure for the shadow economy in Sweden using the questionnaire method, but the proportion who had engaged in black activities or evade tax is not very far from that of either Norway or Denmark. By comparison, the extent of the shadow economy in Sweden based on differences in national accounts statistics is at the same level as the other Nordic countries, despite the fact that the comparison is, of course, more difficult, since another method has been used.

The comparison with Germany is less straightforward. In the first place, an indirect question design is used, where the words black activities and tax evasion are not even mentioned. Secondly, as a result of the question design, that part of black activities paid for in kind is not included in the study. Finally, respondents are only asked about the last three months.

According to the German study, black activities account for 0.6-1.2% of GDP in black market prices. A cautious estimate in formal market prices puts the figure at 1.2-2.4% of GDP. However, due to the indirect question design and shorter period used, it would not be unreasonable to assume that the shadow economy in Germany would be at the same level as in Denmark in the mid-1980s, i.e. 4-

6% of GDP. There is therefore nothing to indicate that the level of black activities in Germany lies significantly below the Scandinavian level measured by the macroeconomic methods, cf. chapter 3, which gives a figure for the shadow economy in Germany in this period of 5-13% of GDP.

Table 6.3: Black activities and/or tax evasion in Norway, Sweden, Holland, Germany and Spain

Country	Year	Proportion who carries out black activities and/or evade tax	Extent of black activities and/or tax evasion	Corrected extent of black activities and/or tax evasion (value in the formal market)	Source
Norway	1980-83	16-18%	4-6% of GDP	4-6% of GDP	Isachsen & Strøm (1981, 1985)
Norway	1988/89	24%	1.3% of GDP	5-6% of GDP	Goldstein (1990)
Norway	1994	15%	-	-	Tufte (1994)
Sweden	1982	23.4%	-	-	Laurin (1986)
Sweden	1982-1984	17.1% of all men	-	-	Wahlund (1991)
Holland	1983-1984	12%	1-3% of GNP	4-5% of GDP	Van Eck & Kazemier (1992)
Germany	1984	4.4%-8.3%	0.6-1.2% of GDP	4-6% of GDP	Wolff (1990, 1991), Merz & Wolff (1993)
Spain	1985	10.6%	Not calculated in relation to GDP	16.9% of GDP	Ahn & De la Rica (1997)

Note: The figures for Norway (1988/89), Holland and Germany are in black prices in column 4. Column 5 tries to correct for differences in both the valuation and definition of black activities used. For example, neither the German nor Dutch researchers include black transactions, and they also omit the entire payment-in-kind part of the black economy. For Spain, the same extrapolation method is used as for the Danish figures. See text for a more thorough explanation of the corrected figures. The figures for Germany are for the former West Germany.

The level in Holland is also the same as in the Scandinavian countries: about 12% of the population had engaged in black activities, corresponding to 1% of GDP in black market prices and 2-3% in formal market prices. To this can be added tax evasion on interest income of about 1.9% of GDP, bringing the figure for the shadow economy up to 4-5% of GDP. The Dutch definition also excludes both black transactions and activities where payment is in the form of a quid pro quo, so the level is probably even higher than 4-5% of GDP. In both Norway, Sweden, Holland, Germany and Denmark, therefore, the shadow economy probably accounts for between 3% and 6% of GDP.

The level of black activities is much higher in Spain. True enough, "only" just under 11% of the population had engaged in black activities, but they do so on a full-time basis. And even this figure is probably an underestimation, since the measurement method used ignores the fact that some persons have a full-time job in the formal sector and carry out black activities in their spare time – which characterises to a large extent the black markets in Holland, Germany, Denmark, Norway and Sweden.

The Spanish researchers have not attempted to calculate the extent of black activities in Spain on the basis of the questionnaire survey carried out by the Ministry of Economic Affairs. Notwithstanding, a cautious estimate based on this survey puts black activities at around 16.9% of GDP in formal market prices, which is considerably above the level in the other countries examined here, though not far from the level in Italy – which, however, is based on differences in the national accounts, cf. chapter 3.

If we look at who carries out black activities in the countries examined here, an interesting pattern emerges. In all the countries bar Spain, it is especially men who had engaged in black activities. In Spain, on the other hand, more women than men had engaged in black activities, the explanation being that they are already covered by their spouse's social security card and therefore have no incentive to pay health insurance. As regards age, for the Scandinavian countries and Spain, the likelihood of being engaged in black activities falls with age, while in Germany and Holland it rises with age up to a point, after which it falls again.

With regard to occupation, it is especially skilled workers who had engaged in black activities, but students are also particularly active in Sweden, Holland and Germany, while the self-employed carry out black activities a lot in Sweden and Spain.

As far as the unemployed are concerned, there is no evidence that they are especially active in the black sector. Neither in Holland, Norway nor Sweden does there appear to be any indication that the unemployed engage more in black activities than others. In Germany there is nothing to suggest that there is a lot of black activity in those parts of the country with a relatively high unemployment. In both Holland and Germany, however, it seems that persons who are successful in the formal economy are more likely to supplement their income by black activities. This is also the case in Denmark.

Researchers in Holland and Sweden have examined the correlation between black activities and people's perception of the risk of discovery by the authorities. Not surprisingly, as in Denmark, if people think the chances of getting caught are low, they are more likely to be engaged in black activities.

It has been harder to demonstrate any correlation between the level of taxation and black activities, however. Neither in Holland nor Sweden is there any sign that people with high marginal taxes are more likely to be engaged in black activities. Not even their perceived marginal tax has any significant effect on whether they are engaged in black activities or not. A similar result was also found for Denmark in 1993/94, cf. Pedersen & Smith (1995).

The advantage of the questionnaire surveys discussed above over the indirect methods discussed in chapter 3 is that they can give an insight into the structure of the shadow economy. The disadvantage of the questionnaire method, of course, is that there is no guarantee that people will answer honestly about their black activities, because they are, after all, illegal. On the other hand, the indirect methods are also extremely uncertain, since, among other things, they are based on a large number of assumptions, some of which are highly unrealistic. On the whole, the results for the five European countries examined in this chapter probably give the most realistic picture of the extent and nature of the shadow economy that can be expected, given the present level of knowledge.



## 7. Summary

The extent of the black sector in Denmark has by now been amply documented through extensive questionnaire surveys. While it is only a small part of Danes' economic activities which evade tax and are therefore sold considerably cheaper than the same services in the formal market, this share increased throughout the 1980s up to 1991, after which it declined somewhat.

During the planning of the collection of Danish figures for 1995-97, the obvious question arose of how these compared with the level in other European countries. Does the level rise, as so often assumed, from north to south in Europe – and if so, how much? And are there differences in the level of black activities between the relatively similar welfare states of northern Europe, so that, for example, in countries (like Denmark) with high direct taxation of earned income, relatively more people choose to work outside the tax system?

The difficulty of measuring black activities in a given country is, of course, that it is precisely the aim of these activities to avoid registration, because the authorities use this for purposes of taxation. Another reason is that research in this area is still relatively new – it is only about 15 years ago that the first large-scale Dutch, Norwegian and Danish questionnaire surveys about black activities were carried out. Measurement *between* countries is complicated by the fact that the dividing line between taxable and tax-exempt activities varies from country to country.

This means that there are only reliable measurements of the size of the black sector in a few countries in Europe – and these mainly in N.W. Europe – and that, where they do exist, they only cover one or a few years at most. This in turn means that, as yet, there is no internationally recognised definition of black activities.

### 1.

*Chapter 1* presents the definition of the “black economy”, “black activities” and the “shadow economy” used in Danish research. The *shadow economy*, which is the most comprehensive of the concepts, consists in part of those productive economic activities which should be included in the official figures for GDP, but which are only partly included due to the aforementioned difficulty of collecting information about them. The definition of the shadow economy used here also includes tax evasion on transfer income, interest income and deductions, etc., which are not directly included in GDP.

The *black economy*, which is part of the shadow economy, consists of two parts. The one is called black activities in a narrow sense. These are productive economic activities which should be taxed, but where tax is not paid because the buyer and seller of the activity agree to conceal it from the tax authorities. Thus, both buyer and seller benefit from non-disclosure, dividing the saved tax and VAT between them. Black activities include both “traditional” moonlighting, such as a car mechanic who repairs a car without billing his “customer”, and black transactions, such as a farmer who sells eggs or milk, etc., on the side.

The other part of the black economy is called ordinary tax evasion. Here, only the one party – the provider of the service/good, etc. – knows about and benefits from non-disclosure to the tax authorities. One example of this is where part of the takings in a flower shop go directly into the owner’s pocket, i.e. they are not rung up on the cash register, without the customer benefiting from the saved tax and VAT.

The black economy thus consists of activities which in themselves are legal, and which should be included in GDP, but which are only partly included because they are not taxed and thus not registered.

In principle, productive illegal activities are also included in the definition of the shadow economy, e.g. prostitution and drug dealing, but in practice these activities are not measured in the Danish questionnaire surveys.

In addition to this, the shadow economy also consists of another kind of tax evasion, e.g. claiming higher deductions than you are entitled to. It can also be – though in practice not very widespread – interest income that is not disclosed to the tax authorities or tax evasion on transfer income. These activities are not directly included in GDP, but are included in the definition of the shadow economy used here.

In practice, only black activities in a narrow sense are measured in Denmark by means of questionnaires.

## 2.

*Chapter 2* discusses other researchers’ attempts to compare the shadow economy in Europe. These contributions have used widely different definitions and data collection methods.

Generally speaking, these contributions can be divided into two groups. The first group consists of – typically broad – attempts at an actual comparison, the authors reviewing a large part of the literature on the shadow economy in differ-

ent countries. The authors present a highly detailed and – most valuably – critical discussion of the various methods used. However, this also means that very different methods, and thus also different definitions of the shadow economy, are dealt with here.

The books in the second group are typically readings of different authors' contributions from different countries. In these books, both the definition of the shadow economy and method used vary widely. Common to them all, however, is that the method used depends to a large extent on the availability of data in the country concerned.

Among other things, chapter 2 presents some of the authors' figures for comparisons of the shadow economy, including the English economist David J. Pyle (1989), whose figures are reproduced in table 2.1 and 2.2, and J.J. Thomas (1992), whose figures are referred to in table 2.3. Inasmuch as the two authors have reviewed a very large and important part of the literature on the shadow economy, these tables give a very useful initial overview of the most quoted works on the subject.

### 3.

*Chapter 3* looks at the underlying principles and aims of the many different methods that have been developed to measure the shadow economy. The chapter also evaluates the ability of the methods to measure the extent of the shadow economy.

The methods vary widely in both approach and the conditions and assumptions underlying them. They also vary a lot in choice of method for measuring the shadow economy. Finally, there are big differences in both the period and year(s) measured.

The so-called monetary methods are probably the most widely used. In principle, these methods allow researchers to evaluate the growth of the shadow economy over a longer period. In practice, however, they are subject to considerable uncertainty. For example, the methods assume, totally unrealistically, that black activities are only paid for in cash – and thus not in kind – and that a given starting point there is no shadow economy at all, i.e. it is set at zero. Furthermore, this starting point is chosen more on the basis of the availability of data than on any serious considerations of when the shadow economy might have been very small or did not exist at all. Moreover, for a country like Germany, whose currency – perhaps as much as 40% of it – also circulates outside the country, these methods are extra vulnerable.

The monetary methods also presuppose that taxation is the only variable that can explain the growth of the shadow economy. The fatal consequences of this limitation for analysis has been shown for both Denmark and Norway.

The methods are thus based on totally unrealistic assumptions. Nonetheless, calculations have been carried out in 14 out of 17 OECD countries using monetary methods. The reason they are so widely used is probably that it is relatively easy and cheap to obtain the required data.

The Austrian Frederick Schneider (1997) has recently collected the main monetary measurements and updated the figures to 1990. Schneider finds that the extent of the shadow economy is considerably higher using these methods than other methods. For most countries, it thus corresponds to 10-15% of GDP. Denmark, at 13.4% of GDP, lies in the middle group, together with Norway (15%), Gt. Britain (14.3%), Holland (13.9%), Germany (13.1%) and Ireland (11.7%). Above this is a group consisting of Italy (23.4%), Spain (21%), Belgium (19.6%) and Sweden (16.7%). The uncertainty of the method is underlined by the fact that other monetary measurements for Denmark in 1990 suggest a level of under 2% of GDP.

Somewhat more uncertain is the method based on differences in the national accounts. The national accounts draw on many different statistical sources; by comparing some of these and at the same time trying to correct for differences of definition, it is possible to form some impression of the extent of the black economy.

Measuring the black economy using the national accounts method depends a lot on the structure of the national accounts in the country concerned and on the sources available to national accounts statisticians. Table 3.2 in chapter 3 shows the extent of the black economy measured by the national accounts. However, due to differences in the way these are calculated, the figures should be interpreted extremely cautiously.

With the exception of Italy, the black economy seems to have accounted for 3-5% of GDP in western Europe in the 1970s and 1980s measured on the basis of differences in the national accounts.

#### 4.

The level of EU members' GDP, and with it the question of whether official GDP figures cover all aspects of the economy – and especially whether they capture the extent of the black economy – has become increasingly important since 1988. From this year, a considerable and increasing share of members'

contributions to EU coffers are based on GNP, which is GDP plus wages plus net investment incomes from foreign nations.

The aim, in an EU context, is not to calculate the size of the black economy as such, but solely to ensure that official GDP figures include all productive economic activities, formal or black.

In most countries, a lot of the calculations of the black economy are implicit, or indirect, a good example being those cases where production is calculated as price times volume. This is the case for agricultural production in all EU countries. If the calculations of the volumes of crop and livestock products cover all production, any part of the production value that is not disclosed to the tax authorities will be automatically included in GDP figures. However, it is normally not possible to determine the exact size of the correction for the black economy in agriculture.

Most EU countries make implicit or explicit corrections for industries where there is expected to be a high level of black activities. Only two countries, France and Italy, make corrections for (nearly) all industries.

The French national accounts try to capture the black economy partly via corrections for under-declaration in registered companies and partly by a correction for black activities in non-registered units where all activity is black. This resulted in a total explicit correction for the black economy of 3.35% of GDP, in addition to which there is an unspecified implicit correction for agriculture by virtue of the price-times-volume calculation for agricultural production. Apart from these corrections, there is also an upward adjustment for value added for firms that have not filed tax returns and accounts. Finally, an additional correction is made for levied, but not paid, VAT, which is to a considerable extent related to under-declaration, though a not insignificant part must be attributed to ordinary bankruptcies. The total upward adjustment for the black economy and irregularities in financial reporting amounted to 6.75% in the French national accounts for 1985.

The results for Italy indicate, as mentioned in chapter 3, a black economy of around 18% of GDP, though due to the method used this can be an overestimation. On the other hand, it does not include parts of the black economy in "agriculture" and "rental accommodation", where the national accounts calculate production by means of indirect methods. The analyses carried out also indicate that, since the black economy flourishes most strongly in small firms, the unique structure of industry in Italy is in itself an important part of the explanation for the large black economy.

In the UK, the national accounts have traditionally operated with a so-called evasion adjustment, which is based on the difference between GDP calculated from the expenditure and income side respectively. This is a somewhat more indirect method than that used in France and Italy. An adjustment percentage is set for a benchmark year for which there is particular data on the expenditure side, e.g. in the form of studies of trade expenditure. GDP calculated from the income side is then corrected in the following years by the fixed adjustment percentage before balancing GDP calculated from the expenditure and production side to a single balanced GDP figure. The evasion adjustment for the benchmark year 1988 was 1.25% of GDP, of which almost 85% is attributed to the self-employed's tax evasion, 12% to black earnings, and the remaining 3% to corporate tax evasion.

The national accounts in both Greece, Portugal and Ireland have been revised in recent years, using a special method – the demographic method – which especially the Italians have used, albeit somewhat less systematically and well-documented as in Italy. These revisions appear to have discovered substantial economic activity not previously covered by the national accounts, most conspicuously in Greece, where GDP was revised upwards by over 20%. Not all this adjustment can be attributed to the black economy, however. Some of it is due to inadequate statistical coverage in earlier national accounts, partly due to the use of outdated company registers.

The demographic method had not revealed any deficiencies in the national accounts in Denmark, which is in accordance with the results from the Rockwool Foundation Research Unit, which show that black activity in Denmark is largely a secondary activity.

## 5.

The Danish questionnaire surveys, which have by now been thoroughly tested, are presented in *chapter 5*, with a focus on new Danish figures for the period 1994-97.

In the Danish surveys, a given non-declared economic activity is defined as black if *both* buyer *and* seller of the activity knows (or assumes) that the activity is not going to be declared.

In 1994, a new, more direct question design was introduced to uncover black activities in Denmark, with the problems of comparisons with older figures, etc., being described in a separate report. This new design has been used in both the 1994, 1995, 1996 and 1997 surveys.

The studies show that, in 1997, 27% of the population in the 18-74 age group had engaged in black activities, which is just under the level in 1994. In 1995 and 1996, the proportion was lower again, namely 22-23% of the population. Those who had engaged in black activities in 1997 did so on average 2 hours and 38 minutes a week.

As in the previous studies of black activities in Denmark, it is especially the young, men and skilled workers who engage in black activities. On the other hand, it is difficult to demonstrate any big regional differences in black activities.

The distribution by kind of activity shows that, as in earlier studies, 45-48% of all black activities are carried out within the service sector, and about 35% in the building sector.

No satisfactory method has yet been developed for extrapolating to a figure for the size of the black sector in relation to overall economic activities, e.g. measured by GDP. A particular problem in this respect is the lack of knowledge about the level of productivity – defined as value added per working hour – in the black sector compared with the rest of the economy. If we assume that there are no great productivity differences between the two sectors, and transfer the black share of the total number of formal working hours in 1997 to a corresponding proportion of GDP in market prices, it corresponds to about DKK 26-29 bn in 1997, or 2.4-2.7% of GDP.

It is important to note that, in calculating the extent of black activities in relation to GDP here, it is assumed that a given piece of work of given quality has the same real value, whether it is taxed or not. Thus, the above-mentioned figure for black activities of DKK 26-29 bn in 1997 is also what the work would be worth had it been carried out in the formal market.

If, alternatively, the black sector had been valued using the actual black prices paid – of perhaps a half to a third of formal market prices – it would give a figure of about DKK 9-15 bn, or 0.8-1.4% of GDP, corresponding to average black hourly wages of between DKK 68-114.

In addition, to go by research in neighbouring countries, total under-declaration in Denmark – i.e. including “ordinary tax evasion” – probably added another DKK 9-10 bn to this figure in 1997. In all, therefore, the shadow economy accounted for DKK 35-39 bn in 1997, or about 3.2-3.6% of GDP in market prices.

The trend since 1994 indicates a weak but steady fall in the extent of black activities.

This trend can hardly be explained by Danes' (low) respect for the tax authorities. Danish (easy-going) attitudes to tax evasion do not seem to have changed much either.

The steady fall in the extent of the black sector is possibly due to political initiatives, and probably even more to continued economic growth. If the current boom ends or falters – or the recent increase in black activities from 1996 to 1997 continues in coming years – the fall in the extent of black activities might stop.

## 6.

Ideally, in order to compare the shadow economy in different countries, a number of conditions must be met.

First, the definition of what is being measured must be the same in all countries. Second, the same measurement method must be used, and third – in principle simple, but in practice difficult to achieve – the same period of time must be measured. Measurement *between* countries is further complicated by differences in the dividing line between taxable and tax exempt activities from country to country.

The review of the international literature on black activities in chapter 3 showed that these conditions have proved exceedingly difficult to fulfil in studies up to now.

*Chapter 6* thus compares the shadow economy in the few countries that have attempted to measure the phenomenon by means of questionnaires. This at least meets the second condition mentioned above, but also approximately the first, namely that countries use the same definition of what is being measured.

There is also another advantage, namely that – albeit still cautiously – the figures for these countries can be compared with the Danish figures.

The discussion of western Europe research into the extent and structure of the shadow economy in chapter 6 thus centres on Norway, Holland, Germany and Spain, for which reliable measurements of the shadow economy have been carried out using the questionnaire method.

It can be seen from table 6.3 that the shadow economy accounted for between 4-6% of GDP in Norway at the beginning of the 1980s, which is the same as the Danish level for the same period. A study carried out in 1988/89 obtained a figure of around 5-6% of GDP in Norway, though using a different extrapola-

tion method, which makes it difficult to compare directly with earlier studies in this decade. Unfortunately, there are no figures for Sweden using the questionnaire method, but the proportion of the population who engage in black activities or evade tax is not all that different from either Norway or Denmark. According to other measurements, especially based on differences in national accounts statistics, the extent of the black economy in Sweden is hardly likely to be much different from either Norway or Denmark.

Moving southwards to Germany, comparisons become more difficult. In the first place, the interview design uses indirect questions, where the words black activities and tax evasion are not even mentioned. Secondly, as a result of the question design, that part of black activities which is paid for in kind is not included in the study. Finally, the German study only asks about the last three months, against 12 months in the Danish studies.

According to the German study, black activities account for 0.6-1.2% of GDP in black market prices. Converted to formal market prices, the level of black activities can be cautiously estimated at 1.2-2.4% of GDP. However, due to the indirect question design and shorter period used, it would not be unreasonable to assume a figure for Germany around the same level as in Denmark in the mid-1980s, i.e. corresponding to 4-6% of GDP. There is thus nothing to indicate that the level of black activities in Germany would be much under the Scandinavian level measured by macroeconomic methods, cf. chapter 3, which gave a figure of 5-13% of GDP for the shadow economy in Germany in this period.

The level in Holland also seems to be the same as in Scandinavia. Thus, around 12% of the population engage in black activities, corresponding to 1% of GDP in black market prices, or 2-3% of GDP in formal market prices. To this can be added tax evasion on interest income of about 1.9% of GDP, bringing the level of the shadow economy up to 4-5% of GDP. The Dutch definition excludes black transactions and activities which are paid for in the form of a quid pro quo, so the true level is probably even higher.

In Norway, Sweden, Holland, Germany and Denmark, therefore, the shadow economy probably accounts for 3-6% of GDP in formal market prices.

The level in Spain is much higher. While “only” 10.6% of the population engage in black activities, they do so full time. This is probably also an underestimate, inasmuch as the measurement method used does not take account of the fact that some people have a full-time job in the formal sector as well as engage in black activities in their spare time, which is the main pattern in the black market in Holland, Germany, Denmark, Norway and Sweden.

The Spanish researchers have not tried to estimate the level of black activities in Spain themselves. However, based on their study, a cautious estimate would put it at about 16.9% in formal market prices, which is vastly above the level in the other countries examined here, though not far from the level in Italy (though this is based on differences in the national accounts, cf. chapter 3 and 4).

If we look at who carries out black activities in the selected countries, an interesting pattern emerges. In all the countries except Spain, it is especially men who engage in black activities. In Spain, on the other hand, it is women who are the most active; they are already covered by their spouse's social security card and therefore have no incentive to pay health insurance. With regard to age, in the Scandinavian countries and Spain, the likelihood of being engaged in black activities falls with age. In Germany and Holland it rises with age up to a certain point, and then falls again.

As far as occupation is concerned, it is especially skilled workers who engage in black activities, but students are also particularly active in Sweden, Holland and Germany, while the self-employed engage a lot in black activities in Sweden and Spain.

In the case of the unemployed, against expectations, there is nothing to suggest that they are more active in the black sector than other groups. Neither in Holland, Norway or Sweden does there seem to be any indication that the unemployed engage in black activities more than others. In Germany there is nothing to indicate that there is an especially high level of black activities in those parts of the country with a relatively high unemployment. For both Holland and Germany, on the other hand, it seems that persons with a good job in the formal sector are more likely to supplement their income by carrying out black activities.

Researchers in Holland and Sweden have examined the correlation between black activities and people's perception of the risk of being caught by the authorities. Not surprisingly, as in Denmark, if people do not think the risk of penalty is very high, they are more likely to be engaged in black activities.

On the other hand, it has been difficult to demonstrate any correlation between taxes and black activities in those countries where this has been examined. There is no indication in either Holland or Sweden that people with high marginal taxes are more likely to be engaged in black activities. Not even their perception of how much marginal tax they pay has any significant effect on whether they engage in black activities or not. A similar result was found for Denmark in 1993/94, cf. Pedersen & Smith (1995).

The advantage of questionnaire surveys over the indirect methods discussed in chapter 3 is that they give an insight into the structure of the shadow economy. The disadvantage, of course, is that you can never be sure that people answer truthfully about their black activities, these being illegal activities. However, the indirect methods are also subject to great uncertainty, since, among other things, they are based on a large number of assumptions, some of which are unrealistic to say the least. On the whole, the results for the five countries examined in chapter 6 probably give the best possible picture of the extent of the shadow economy, given today's level of knowledge.

This reasonably realistic picture thus suggests that indirect methods without the use of questionnaires have grossly overestimated the extent of the shadow economy in west European countries. In Denmark, the shadow economy is now contracting slightly.

In the northern part of Europe, there does not seem to be any great difference in the size of the shadow economy in the countries examined here. However, there is a sharp increase in level from the north European countries to the Mediterranean countries.



## Appendix 1: Tax ethics - Danish experiences 1980-1997

by Gunnar Viby Mogensen, Director of Research, Rockwool Foundation Research Unit

The trend in Danes' moral standpoint on tax evasion has only been measured to a reasonably satisfactory degree since about 1980.

These measurements, using identical concepts and covering two or more years, have since then been carried out by two researchers, Peter Gundelach and Ole Riis (for the years 1981 and 1990), and the Observa/Sonar opinion research institutes (using several different measures for parts of the period 1980-1994) respectively. The material for this paper was kindly made available by Dansk Data Arkiv (Danish Data Archives) and the Sonar Institute. The paper also includes measurements carried out by the Rockwool Foundation Research Unit (for the period 1992-1997).

In "Danskernes Værdier" (Copenhagen, 1992), Gundelach and Riis compare two interview surveys, together called the "value survey". These were carried out as face-to-face interviews in respondents' homes by Observa in 1981 (with 1182 respondents) and - on the initiative of Peter Gundelach and others - the Danish National Institute of Social Research in 1990 (with 1030 respondents). In all, these surveys contain 21 questions on "moral" issues, of which about 1/3 have an economic dimension. One of the latter concerns tax ethics.

This was measured based on a question about the extent to which the respondent accepted certain actions, including "evading tax if the opportunity arises". Respondents could choose between answers on a scale of 1 ("don't accept at all") to 10 ("accept to a large extent"), enabling an index of tax ethics to be calculated for each of the two observation years (see also Gundelach & Riis, Appendix 1 and 3).

The index for tax ethics had a value of 2.4 for both years. By comparison, the value for "receiving welfare benefits you are not entitled to" was 1.3 in 1981 and 1.5 in 1990. For the *whole* analysis, there was a low of about 1, i.e. a very low acceptance (of car theft), and a high of about 6, i.e. a relatively high acceptance (of divorce) (p. 47).

From 1980 and 1990 respectively, Observa and Sonar carried out a number of surveys of tax ethics, which have been widely reported in the Danish media. These employed less differentiated answer categories than the Gundelach/Riis surveys, respondents usually only being able to choose between "strongly agree", "partly agree", "partly disagree", and "strongly disagree", plus the category "don't know".

The data collection method used a mail questionnaire with questionnaires being sent to a panel, about 1/4 of whom were changed every year. The respondent population in these surveys has typically been about 1200 persons.

All reasonably comparable questions in these surveys are shown in appendix table 1. The topics covered by the questions appear in the same order as in the first Observa survey on tax ethics in 1980, namely (section A in appendix table 1) whether people generally feel that earning black money is acceptable, whether such activities are “directly immoral” (section B), and the extent to which the respondent would earn black money himself if the opportunity arose (section C).

The table also contains the main results of the surveys, in the form of the percentage of respondents with an opinion on the matter who *clearly* accept the forms of tax evasion mentioned.

The series which Sonar relatively regularly publishes also includes the results of a question about whether the respondent would report his neighbour to the tax authorities if he found out that the neighbour had been getting any black work done (e.g. on his house, car, etc.). However, the fact that there is an element of *both* the respondent’s evaluation of his own (informer) ethics *and* the neighbour’s tax ethics in the same answer makes it less useful to include this particular measure, which is therefore omitted here.

Unfortunately, there also seems to be problems with the viability of the questions actually included in the table, especially because Observa changed the way it asked questions in all three areas to a greater or lesser extent between 1983 and 1987, but *also* because of new changes in the questions when Sonar took over the surveys in 1990.

Nearly all the measures in the table have been published before, most widely in Jyllands-Posten (with an overall view on 29/11-1987 and 12/5-1994), one of the main Danish dailies. Where possible, and with the kind help of Sonar, Jyllands-Posten and Dansk Data Arkiv (Danish Data Archives), the questions are reproduced in their original form. This makes comparisons over time easier than has previously been possible.<sup>48</sup>

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<sup>48</sup> Some of the results thus differ somewhat from the figures for the trend in tax ethics (1980-87) published in the newspapers and later included in G. Viby Mogensen (ed.), 1990, *Time and Consumption*. Danmarks Statistik (chpt. 13).

Appendixtable 1. Attitudinal surveys on tax ethics carried out by Observa/Sonar between 1980-1994.

	Year	Percentage who find it completely acceptable to earn black money among respondents with an opinion
A.1. <u>Observa</u> "With the taxes being so high, I see nothing wrong in working without paying tax if the opportunity arises".....	1980 1981 1982 1983 1992	Agree strongly: 22 22 20 21 17
A.2. <u>Observa</u> "With taxes being so high, I see nothing wrong in others working without paying tax if they have the opportunity".....	1987	Agree strongly: 19
<u>Sonar</u> "With the tax burden being what it is, I see nothing wrong in others earning black money if they have the opportunity".....	1990 1992 1994	Agree strongly: 31 25 23
B. <u>Observa</u> "I think it is directly immoral not to declare money earned on the side to the tax authorities".....	1980 1981 1982 1983	Disagree strongly: 20 21 21 21
("I think it is directly immoral not to declare all earnings to the tax authorities".....	1987	19)
C. <u>Observa</u> "If it were possible to earn black money, I'd do so immediately".....	1980 1981 1982 1983	Agree strongly: 30 35 29 29
"If there were an opportunity to earn black money, I'd take it immediately".....	1987	31
<u>Sonar</u> "If I had the opportunity to earn black money, I'd take it immediately".....	1990 1992 1994	45 39 35

As can be seen from section A.1 in appendix table 1, the general nature of the question - "I see nothing wrong" in working without paying tax - allows a comparison between the years 1980, 1981, 1982, 1983 and 1992.

However, the series cannot be linked with the answers in section A.2. In the first series (A.1), the respondent himself was involved, while in A.2 he is merely an "observer".

On the other hand, Sonar's change from 1990 in the question about the extent to which there is "nothing wrong" with others working without paying tax is relatively modest (see section A.2, where the main change between 1987 and 1990 is that "with taxes being so high" has been replaced by "with the tax burden being what it is"). Even though the change *can* be regarded as a slight dramatisation (see below), it is hardly enough to prevent *both* years from being included in the series.

It will *also* be shown below that the variation in the series between 1987 and 1990 relatively closely parallels the variation in another of the series we now turn to.

Unfortunately, the *other* main topic which Observa asked about in the questions from 1980, namely whether non-declared earnings were "directly immoral" (see section B), was changed fundamentally between 1983 and 1987, from the non-declaration of "income on the side" to "all income".

Since the original formulation from 1980-1983 was not repeated later either, this series cannot be extended beyond the period 1980-1983.

The third and last of the original Observa topics, namely whether the respondent would take the opportunity *himself* if it arose (see section C) has, *on the one hand*, been measured with slight differences in formulation. Furthermore, the measurement is subject to a not inconsiderable doubt. The question has been asked without a screen for separating those respondents who actually admit to having been active in the shadow economy - and who might now be somewhat puzzled by the formulation: They *have* had the opportunity, and they *have* taken it.

To this must be added that the big increase in acceptance of tax evasion between 1987 and 1990 (from 31% to 45% "strongly agree") conflicts with Gundelach & Riis' conclusion that there was no change in tax ethics between 1981 and 1990. However, the formulation "black money" could conceivably also include non-black income, namely tax-exempt income (in Denmark, a certain maximum amount of income allowed without tax - DKK 30,600 in 1997), without it leading to any serious error: since the question always comes after two other questions about black activities or tax evasion, the respondent can hardly be in doubt about the meaning of this third question.

*On the other hand*, this picture of widespread acceptance of tax evasion in the latter part of the 1980s corresponds fairly closely to whether respondents think there is “nothing wrong” with other people working without paying tax, as can be seen from the above-mentioned Observa/Sonar measurements (see section A.2). The percentage of respondents who “strongly agree” with this increased between 1987 and 1990 from 19% to 31%. This is supported by the response to the following question which the Rockwool Foundation Research Unit put to a representative sample of adult Danes in 1988: “Do you think that the public’s opinion of black activities has changed over the past 10 years?” Of the 2702 replies received, 62% said that it was “accepted more now”, 33% said that it was “more or less unchanged”, while only 5% thought that public opinion about black activities had become more critical during the past 10 years.

On the whole, the results under section C should probably be included in the overall picture - despite the minor changes in formulation - but only as a part of the overall picture which *all* the morality measures can draw.

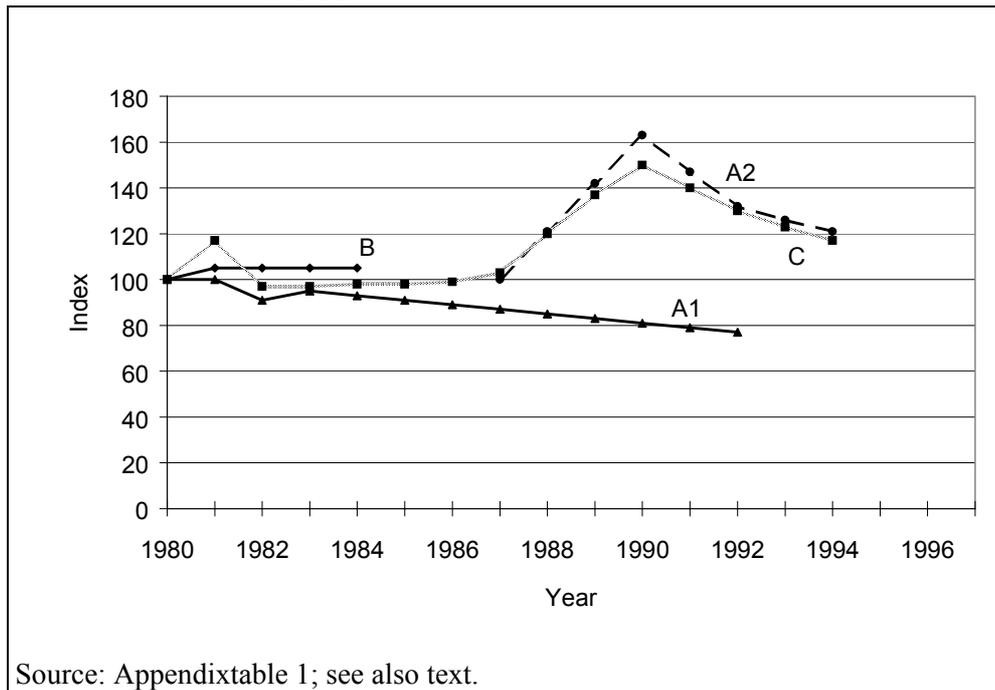
To sum up before turning to the last type of morality measures (from the Rockwool Foundation Research Unit for the period from and including 1992), this overall picture thus consists *partly* of Gundelach & Riis’ figures showing unchanged tax ethics in the 1980s and *partly* of the four measurements from private opinion survey institutes (A.1, A.2, B and C in appendix table 1).

As far as the start and middle of the 1980s are concerned, these measurements do not significantly contradict Gundelach & Riis’ result showing a stagnation in tax ethics. Two of the three measurements from the private institutes indicate that, from about 1987 to the end of the decade, tax ethics declined considerably, only to move in the opposite direction again from about 1990 (see appendix figure 1). However, according to the third measurement, ethics were, if anything, stricter. In the figure, the Observa and Sonar measurements are plotted as an index, with their first year of measurement set at 100.

The measurements of tax ethics carried out for the Rockwool Foundation Research Unit between 1992-1997 were designed in such a way as to avoid altogether the aforementioned screening problem that has possibly influenced the value of the longest series in appendix table 1 (series C).

The four interview surveys, based on samples of different size, carried out for the Rockwool Foundation Research Unit in 1992, 1993/94, 1996 and 1997 (for 16-67-year-olds) had responses from 5216, 4048, 1394 and 1817 persons respectively. All respondents were asked whether they had performed black activities themselves during the past 12 months. All who said they *had not* were then asked: “If the opportunity arose, would you be willing to carry out any black activities?”

Appendixfigure 1. Tax ethics, 1980-94. Public acceptance of tax evasion/black activities.



Of respondents with an opinion, the proportion who accepted black activities in the sense that they either did so themselves or were willing to do so if the opportunity arose was as follows:

1992	54%
1993/94	57%
1996	59%
1997	67%

Preliminary figures for 1992, based on answers from 4812 persons, have previously been published elsewhere, namely as chapter 12 in Rapport fra Udvalg om Personbeskatning (Report of the Committee on Personal Income Tax) (Copenhagen 1992), and reprinted in G. Viby Mogensen (1994), Research in the black sector in Denmark, 1980-92, Statistics Denmark (Working Paper no. 6 from the Rockwool Foundation Research Unit). The measurement for 1993/94 is based on data collected in the last quarter of 1993 and the first quarter of 1994. In the following, this is referred to as a 1994 measurement.

The overall impression of these measurements of tax ethics is that, for *the period 1980 to around 1987*, both the research results from Gundelach & Riis and the

figures from the private market research institutes indicate a relatively stable tax morality in Denmark. *For the years around 1990* - where Gundelach & Riis' surveys stop and the Rockwool Foundation Research Unit's surveys have not yet begun - the conclusion from the private market research institutes are uncertain.

For the *period from 1992 and onwards*, the private institutes have only carried out one further measurement, namely for 1994. This indicates a continuing - albeit slightly less strong - tendency towards a stricter morality, despite the fact of increasing uncertainty in the measurements in the form of a larger proportion of respondents answering "don't know" (18% in 1994 as opposed to only 12% in 1992, cf. Jyllands-Posten, May 12, 1994). As mentioned above, the four Rockwool Foundation Research Unit measurements from the period 1992-1997 indicate a tendency towards a somewhat laxer morality.

An *overall* impression of these tendencies can be obtained by calculating a simple average of all six morality measurements for all or parts of the period 1980-1997. This so-called "actual average of all indexes", shown in appendixfigure 2, is based on the previously used index for each individual measurement, with the result of the first year of measurement set at 100. A linear trend is assumed for the intervening years in which measurements were not carried out.

The average is naturally calculated in such a way that the addition or subtraction of one of the six indexes does not affect the average in the year concerned - in other words, the overall average of indexes is continuously "buoyed up" by movements in the *other* indexes in the calculation.

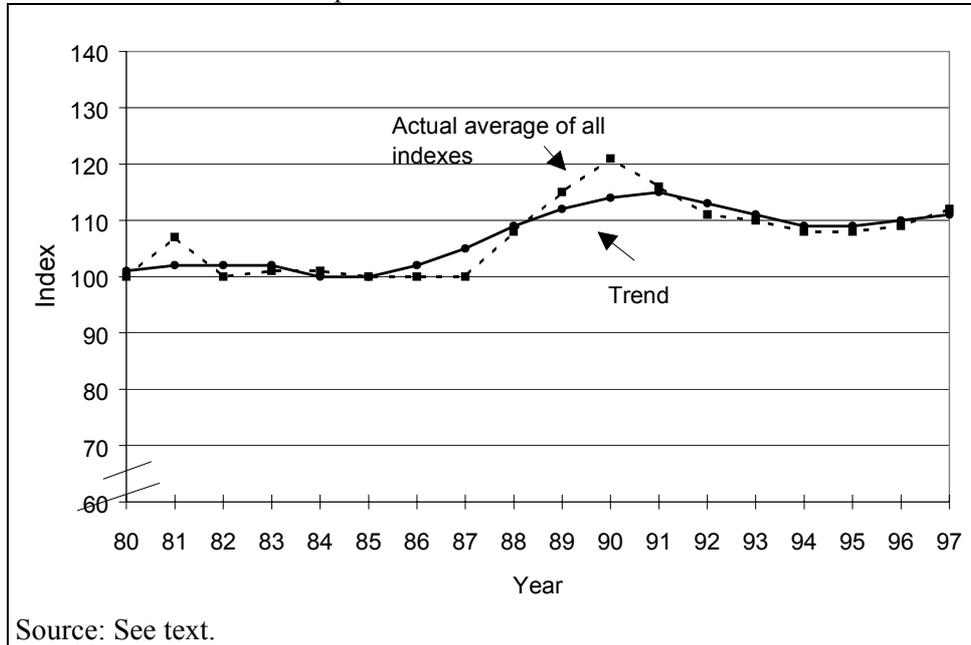
This gives the following results:

<u>1980-1988</u>		<u>1989-1997</u>	
1980	100	1989	115
1981	107	1990	121
1982	100	1991	116
1983	101	1992	111
1984	101	1993	110
1985	100	1994	108
1986	100	1995	108
1987	100	1996	109
1988	108	1997	112

As can be seen, such a comparison of all six measurements points to a relatively stable tax morality in the mid-1990s. Various historical surveys indicate that this can also be true of the end of the 1970s, i.e. the years just *before* the measure-

ments here. If we accept this assumption of a stable morality level before 1980 and after 1997, then we can reasonably convert the average index above to a trend based on a 5-year sliding average for each of the years 1980-1997, which will give the trend curve shown in appendixfigure 2.

Appendixfigure 2. Tax ethics 1980-97. All existing measurements of public acceptance of tax evasion/black activities.



If this is an accurate picture of the overall trend, particularly as regards black activities, then tax ethics in Denmark have become somewhat more “liberal” in the 17-year period covered by the measurements: the proportion of the adult population accepting tax evasion would seem to be 10% higher in 1997 than in 1980.

Within this period, however, the end of the 1980s seemed to show a much “laxer” tax morality, which only “flattened out” again in the 1990s - though not back to the level around 1980.

The results are uncertain. However, taken at face value, they do not deviate much from what could be expected given Gundelach & Riis’ results for 1981 and 1990. This is particularly so when it is remembered that, though Gundelach & Riis find a stable tax morality in the 1980s, for economic relations between citizens and the state *as a whole*, there was a slide in the direction of a lower morality: throughout the 1980s, it apparently became more and more acceptable to claim welfare bene-

fits people had no right to - and, furthermore, to use public transport without paying.

The issues this raises about the relation between tax ethics and other social ethics have, besides, been the topic of a special research project by the Rockwool Foundation Research Unit, with professor Jørgen Goul Andersen from the University of Aalborg as researcher on a large population survey. The main results are presented, and commentated by professor Jörgen Westerståhl from the University of Gothenburg in the newsletter (in English) no 3 from the Rockwool Foundation Research Unit, published in September 1998 (also available on the internet: [www.rff.dk](http://www.rff.dk)).



## Appendix 2: Different terms for black activities

English/American	Germany	French	Swedish	Norwegian
Black Economy / Market(s) / Activity(ies)	Schwarzarbeit	Le Travail au Noir	Svarta Sector	Svart Sektor
Clandestine Employment	Schattenwirtschaft	L'conomie informelle		
Hidden Economy	Untergrundwirtschaft			
Illicit Work	Verborgene Wirtschaft			
Informal Economy	Heimliche Wirtschaft			
Invisible Economy	Informelle Wirtschaft			
Irregular Economy / Sector	Irreguläre Wirtschaft			
Moonlighting				
Non-official				
Parallel Economy				
Second Economy				
Shadow Economy				
Subterranean Economy				
Underground Economy				
Unobserved Economy				
Unofficial Economy				
Unrecorded Economy				



### **Appendix 3: Non-response analysis and response rates**

One of the biggest problems with questionnaire surveys is that you can never be sure that respondents answer questions about whether and how much they carry out black activities honestly. And it is extremely difficult – not to say impossible – to determine the extent to which people withhold information from the interviewer. In order to get an idea of the quality of a questionnaire survey, it is often useful to look at both the response rate and how many refuse to participate at all. This can be seen from appendix table 3.3 below, which is discussed in chapter 5 and will therefore not be commented on further here.

As mentioned in chapter 1, there is also a problem in the actual interview situation. Despite the fact that the Rockwool Foundation's Research Unit has always employed highly qualified interviewers from the Danish National Institute of Social Research and Statistics Denmark, it cannot be ruled out that, in the actual interview situation, the interviewer feels uncomfortable asking people about black activities, which is, after all, an illegal activity.

This problem was examined in Viby Mogensen et al. (1995), the results of which showed that an interviewer effect could be demonstrated for questions about black activities. But an interviewer effect was also demonstrated for other sensitive questions, e.g. gross earnings from ordinary jobs, or whether the respondent had smoked marijuana or taken sleeping pills. The biggest effect was found for questions about black activities, though it was not much bigger than for the other questions. Moreover, an interviewer effect was also demonstrated for a question that was not expected to be especially sensitive at all, namely whether the respondent had "A" levels or a Higher Preparatory Examination.

It has not been possible to say whether the interviewer effect drags the frequency of black activities in the one direction or the other. What can be said, however, is that the existence of an interviewer effect means a greater uncertainty in the results.

Another problem with questionnaire surveys is the non-response in relation to the original sample, which would otherwise be a very accurate version in miniature of the whole population. It has, however, been possible to obtain some information at the individual level about the composition of the original sample in the studies on black activities using the new question design from 1994 to 1997.

This information has been accessible because the sample was drawn from the CPR register (central personal register). As regards the surveys carried out by the Danish National Institute of Social Research, it has been possible to obtain information about sex, age, marital status and place of residence, while for the omnibus surveys carried out by Statistics Denmark, information has been ob-

tained about sex, age, marital status, number of children under 18 living at home, place of residence and whether the respondent lives in a house or flat.<sup>49</sup>

It is thus possible to examine more closely whether the sample that has been interviewed is at all biased as regards the above-mentioned characteristics. If it is very biased, there is all the more reason to interpret the results with caution. The analysis is carried out by means of a logistic regression analysis, where the response variable has the value 1 if an interview is carried out and 0 if it has not. The results of the regression analysis are shown in two tables (appendix table 3.1 and 3.2 below), since the explanatory variables from the Danish National Institute of Social Research and Statistics Denmark surveys differ somewhat.

As can be seen in appendix table 3.1, the chances of an interview being carried out fall with age. This applies to all the Danish National Institute of Social Research surveys. The reason for this is that the older the persons selected to participate in the survey, the more likely they are to refuse to participate.<sup>50</sup> With regard to marital status, the likelihood of obtaining an interview with married persons is significantly greater in the 1994-96 surveys. Moreover, in the 1995 and 1996 surveys, there are significantly more interviews with widows, while in 1996 there were also significantly more with divorcees. This reflects the fact that there are significantly fewer interviews with unmarried persons, who often live alone and are therefore probably more difficult to find at home.

The appendix table shows that there are no significant regional differences in the 1994 and 1995 surveys, while there are in the 1996 survey. Thus, in 1996, there is significantly less likelihood of an interview in Copenhagen, while the chances of an interview are significantly higher in south, west and east Jutland. However, the variable for Copenhagen is positive – though without being significant – in the 1994 and 1995 surveys.

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<sup>49</sup> There is unfortunately no information about occupation for the original sample, so it is not possible to analyse the non-response by occupational groups.

<sup>50</sup> Thus, a logistic regression analysis has also been carried out (not shown here) where the response variable has the value 1 if the selected person refuses to participate in the survey and 0 otherwise.

Appendixtable 3.1: Logistic regression of the likelihood of participation in the Danish National Institute of Social Research's omnibuses in 1994-96<sup>1)</sup>

	1994		1995		1996	
	Coefficient	Standard Error	Coefficient	Standard Error	Coefficient	Standard Error
Constant	2.1689**	0.2280	1.8834**	0.2682	2.0955**	0.1901
Sex						
Male	0.0546	0.1032	0.1587	0.1238	-0.0309	0.0869
Female	-	-	-	-	-	-
Age <sup>2)</sup>	-0.0235**	0.00354	-0.0331**	0.00442	-0.0288**	0.00315
Marital status						
widowed	0.2951	0.2255	0.5783**	0.2831	0.7448**	0.1988
divorced	0.3074	0.2121	0.1414	0.2543	0.5169**	0.1744
married	0.5189**	0.1411	0.6444**	0.1741	0.7622**	0.1225
single	-	-	-	-	-	-
Place of residence						
Copenhagen	0.0675	0.2194	0.3502	0.2592	-0.4792**	0.1761
Cop. suburbs	-0.00004	0.2039	0.1409	0.2524	-0.1419	0.1714
Other Zealand + Lol.+Fal.+Bornh.	0.1964	0.1979	-0.1166	0.2272	0.0219	0.1624
Funen	-	-	-	-	-	-
South Jutland	0.2262	0.2712	0.4076	0.3353	0.4086	0.2454
West Jutland	0.1928	0.2291	0.3882	0.2836	0.6321**	0.2066
East Jutland	0.1394	0.1987	0.3213	0.2361	0.5536**	0.1726
North Jutland	0.3354	0.2172	0.4826	0.2489	0.3405**	0.1733
-2 Log L		2475.969		1636.473		3449.865
Proportion with de- pendent variable=1		81.8%		71.6%		78.6%
No. of observations		2,685		1,455		3,494

1) The dependent variable has the value 1 if the respondent has participated in the survey, and 0 otherwise.

2) The age variable is included as a continuous variable.

\*\* Indicates that the coefficient is significant at the 5% level.

The likelihood of an interview also falls with age in the omnibus surveys carried out by Statistics Denmark (appendixtable 3.2). The variable is significant in the 1996 survey, but not in the 1997 survey. In an alternative run (not shown here), where age is inserted as the grouped variable, however, there is significantly less likelihood of an interview being carried out for the 46-55-year-olds. This can also be explained by the refusal of significantly more of the older respondents to participate in the omnibus surveys. There is also less likelihood of carrying out an interview with the single, where the variable is significant in 1996 but not in 1997. Conversely, the more children under 18 the selected persons have, the greater the likelihood of an interview.

There are no clear regional variations in Statistics Denmark's surveys as regards the likelihood of an interview, either. Thus, in 1997, there is significantly less likelihood of being able to carry out an interview in Copenhagen, while in 1996 there is a greater likelihood, though the variable is not significant. For 1997, there is significantly less likelihood of interviews in Zealand (minus Copenhagen and suburbs), Lolland, Falster and Bornholm, together with north Jutland. In the 1997 survey, this can be explained by the fact that there are more refusals in these areas. The same variables are reversed in the 1996 survey, but are not significant.

For all the surveys, there are no significant differences between the sexes as regards the likelihood of an interview.

Appendixtable 3.2: Logistic regression of the likelihood of participation in Statistics Denmark's omnibus surveys, 1996 and 1997<sup>1)</sup>

	1996 (February)		1997 (February+May)	
	Coefficient	Standard Error	Coefficient	Standard Error
Constant	1.9940	0.2956	1.8136	0.2588
Sex				
Male	-0.1568	0.1196	-0.0737	0.0995
Female	-	-	-	-
Age <sup>2)</sup>	-0.00927**	0.00385	-0.0008	0.00321
Single (0/1)	-0.3969**	0.1368	-0.1994	0.1144
No. of children under 18	0.1335	0.0791	0.2403**	0.0702
Place of residence		□		
Copenhagen	0.3220	0.2933	-0.5649**	0.2534
Copenhagen suburbs	0.2439	0.2778	-0.4308	0.2377
Other Zealand+Lol.+Fal.+Bornh.	0.00179	0.2439	-0.4944**	0.2243
Funen	-	-	-	-
South Jutland	0.0946	0.3272	-0.3995	0.2903
West Jutland	-0.0335	0.2743	-0.2700	0.2499
East Jutland	0.00907	0.2443	-0.4049	0.2221
North Jutland	0.0445	0.2562	-0.4864**	0.2321
Flat (0/1)	-0.1720	0.1501	-0.1692	0.1301
-2 Log L	1792.700		2538.793	
Proportion with dependent variable=1	81.2%		79.1%	
No. of observations	1,886		2,511	

1) The dependent variable has the value 1 if the respondent has participated in the survey, and 0 otherwise.

2) The age variable is included as a continuous variable.

\*\* Indicates that the coefficient is significant at the 5% level.

Generally speaking, therefore, in the omnibus surveys in the period 1994-97, the older the persons in the sample, the less likelihood there is of an interview, while there are no significant differences between men and women. And there is least likelihood of interviews with single people without children or other unmarried persons. The variable thus has the same sign in all the surveys here, but is not significant in all cases. It is more difficult to reach general conclusions about the regional variation. However, there seems to be the least likelihood of an interview in those cases (two out of the five studies) where the variable for Copenhagen is significant. The variable is correlated with the marital status of the interviewees, however, there being relatively more single people without children or other unmarried persons in Copenhagen than in other parts of the country.

The increasing non-response with age indicates that the measures of the proportion of Danes who engage in black activities are thus somewhat overestimated, since age is a significant determinant of black activities (less black activities

with age). But for the other variables, there is nothing to indicate that this influences the black frequency.

The fact that there are no biases in the sample with regard to sex, which is otherwise a significant determinant of black activities, means that it should not be able to influence the frequency of black activities. And the smaller likelihood of an interview with singles without children and other unmarried persons is hardly likely to affect the frequency of black activities either, since this variable is not a significant determinant of black activities, cf. chapter 5.

Appendixtable 3.3: Results of the omnibus surveys on black activities, 1980-97

	1980	1984	1986	1988/89	1991	1993	1994	1994	1995	1996	1997
1. Selected from CPR (central personal register)	4,037	4,005	2,004	5,996	2,003	1,567	2,638	3,216	1,730	5,911	3,000
-excluded from sample due to death/moved abroad <sup>1)</sup>	47	7	16	22	4	5	7	9	1	14	11
3. New sample	3,990	3,998	1,988	5,974	1,999	1,562	2,631	3,207	1,729	5,897	2,989
- excluded from sample due to not having a phone/no phone number	-	-	-	-	-	252	431	522	274	987	478
5. New sample	3,990	3,998	1,988	5,974	1,999	1,310	2,200	2,685	1,455	4,910	2,511
6. Interviews carried out	3,077	3,066	1,545	4,493	1,545	1,074	1,754	2,197	1,042	3,914	1,985
7. Refusals <sup>2)</sup>	570	575	295	980	271	151	294	320	274	567	210
8. Not at home	124	123	41	151	58	30	52	53	64	205	111
9. Other non-response <sup>3)</sup>	219	234	107	350	125	55	100	115	75	224	205
10. Carried out in % of 3	77.1%	76.7%	77.3%	75.2%	77.3%	68.8%	66.7%	68.5%	60.3%	66.4%	66.4%
11. Carried out in % of 5	77.1%	76.7%	77.3%	75.2%	77.3%	82.0%	79.7%	81.8%	71.6%	79.7%	79.0%
12. Refusals in % of 5	14.3%	14.4%	14.8%	16.4%	13.6%	11.5%	13.4%	11.9%	18.8%	11.5%	8.4%

1) The non-response is due to a time lapse between selecting the sample and carrying out the interviews.

2) Here, refusals indicate that the selected persons refuse to participate in the *whote* survey, not just refuse to answer the questions on black activities. Other non-response covers illness/handicap, not at home, moved, language difficulties.

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