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COMPENDIA 2000.2: a harmonized data set of business ownership rates in 23 OECD countries

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Summary

In this report we present a harmonized data set over the period 1972-2000, containing two-yearly data on the number of non-agricultural business owners and the size of the labour force for 23 OECD countries, as well as the quotient of these two variables which is called the business ownership rate of a country. The data set is called COMPENDIA (version 2000.2), which means COMParative ENtrepreneurship Data for International Analysis. It has been constructed by EIM Business and Policy Research, using official OECD statistics (in particular OECD Labour Force Statistics) as well as other relevant sources. The 23 countries are the 15 countries of the European Union plus Iceland, Norway, Switzerland, the United States, Japan, Canada, Australia and New Zealand.

In COMPENDIA 2000.2 we have made an attempt to make business ownership rates comparable across countries and over time. This is not straightforward as different countries measure business ownership or self-employment in different ways, and these differences are not always corrected for by OECD. The main problem in harmonizing business ownership data is the varying statistical treatment of owner/managers of incorporated businesses (incorporated self-employed), as this category of workers is classified as wage-and-salary workers in some countries, and as self-employed workers in other countries. We have chosen our business ownership definition to include unincorporated and incorporated self-employed. However, unpaid family workers, self-employed in the sectors agriculture, hunting, forestry and fishing, and individuals who are self-employed as secondary occupation (next to wage-employment) are all excluded from our business ownership count.

For countries not following our business ownership definition in OECD Labour Force Statistics, we make corrections. This involves estimation of the number of incorporated self-employed as well as removal of unpaid family workers from the data. We also correct for trend breaks. For these corrections we make use of various other sources. The present report provides a detailed description of the construction of the COMPENDIA data for each country. Special attention is paid to the United States. This country alone represents about 30% of all self-employed reported in the COMPENDIA data set.
1 Introduction

In present times there is renewed attention for the role of entrepreneurship in the economy. This is reflected by an increasing amount of research in the field of entrepreneurship. Much of this research is qualitative in nature. Far less entrepreneurship research is quantitative. In particular, there are relatively few known studies which use data bases with internationally comparable figures on entrepreneurship. Such data bases are important in understanding the role of entrepreneurship in economic processes, as they enable cross-country comparisons. A measure that is often used to operationalize the extent of entrepreneurship in a country is the number of self-employed individuals or business owners. However, the comparability of international self-employment or business ownership data is a major problem. The numbers of self-employed reported in OECD Labour Force Statistics - one of the most important data sources on the subject - are not comparable across countries as each country supplies figures according to its own self-employment definition. In particular, the extent to which owner/managers of incorporated businesses (OMIBs) are included in the self-employment counts differs across countries. For a long time this problem was not very well-known. However, in chapter 5 of OECD Employment Outlook June 2000, attention is being paid to this particular subject, and an overview of self-employment definitions used in various (OECD) countries is provided.

In recent years, EIM has made an attempt to construct an international data base with (macro) self-employment figures for 23 OECD countries that are comparable across countries. The 23 countries are the 15 countries of the European Union plus Iceland, Norway, Switzerland, the United States, Japan, Canada, Australia and New Zealand. The figures have been collected for the period 1972-2000, at a two-yearly basis (i.e., even years only). The data base is called COMPENDIA (COMparative ENtrepreneurship Data for International Analysis).

To arrive at such a uniform data base, we first established the exact definition per country used in OECD Labour Force Statistics, the main data source for COMPENDIA. Next, we have chosen a self-employment definition to be used in our uniform data base. In choosing a definition, we acknowledged that business ownership (self-employment) and entrepreneurship are related but not synonymous concepts. Entrepreneurship in a ‘Schumpeterian sense’ refers to the activity of introducing ‘new combinations’ of productive means in the market place. Entrepreneurship in a broad economic sense (business ownership or self-employment) means owning and managing a business, or otherwise working on one’s own account. Thus, on the one hand Schumpeterian entrepreneurs are a small fraction of the business owners, while on the other hand some entrepreneurs (so-called intrapreneurs) do not work on their own account. In COMPENDIA we have chosen a strict application of the broad entrepreneurship definition given above. This involves inclusion of owner/managers of both unincorporated and incorporated businesses and exclusion of unpaid family workers. Following statistical convention, our definition excludes so-called ‘side-owners’ (self-employment as a secondary activity). For practical reasons, COMPENDIA also excludes self-employed individuals in the sectors agriculture, hunting, forestry and fishing.

For a complete overview about the relation between the concepts entrepreneurship and self-employment/business ownership, see Wennekers and Thurik (1999).
For countries not following the COMPENDIA definition in OECD Labour Force Statistics, we made a correction to arrive at an estimate for the number of self-employed persons according to the required definition. The insights about the definitions used and the best ways to apply the corrections have been changing over time, as new pieces of information have become available. As a result, the COMPENDIA data base is continuously in progress. Up till now, there have been three distinct versions of the data base which are used in different studies. The first version of the data base, COMPENDIA 1998, was used for the analyses performed in Carree et al. (1999), Noorderhaven et al. (1999) and Wildeman et al. (1998). The second version, COMPENDIA 1999, was used in Carree et al. (2000). Part of the COMPENDIA 1999 data base (data for 9 countries) is printed in Verhoeven and Becht (1999), pp. 19-20. The third version, COMPENDIA 2000.1, was used in Carree et al. (2002) and Audretsch et al. (2001 and 2002). Part of the COMPENDIA 2000.1 data base (data for 9 countries) is printed in Verhoeven et al. (2001), pp. 19-21. The 2000.1 version contained data up to 1998, and was based on OECD Labour Force Statistics, version 1978-1998.

Recently, a new update of the data base has been made and the present version is called COMPENDIA 2000.2. The new update involves the addition of an extra year (2000), and, for some countries, an update of the data for earlier years. The latter was necessary when respective data in OECD Labour Force Statistics 1981-2001 were changed compared to the 1978-1998 version.

In the present report, we document the COMPENDIA 2000.2 data base. We describe in detail what the self-employment figures represent and how the figures were obtained. In doing so, we pay special attention to the United States, as this is by far the most important OECD country with regard to entrepreneurship.

The structure of this report is as follows. In chapter 2, we discuss the self-employment (business ownership) definition used in COMPENDIA. Also, we discuss the self-employment data that are published in OECD Labour Force Statistics, which is the main source for our data base. In chapter 3 we discuss the general method that - in principle - is used for correcting the raw LFS data. In chapters 4 and 5 we discuss the specific data problems per country. Chapter 6 deals with the variable total labour force, which is used as scaling variable in order to obtain business ownership rates. The final chapter is used for discussion.

1 In the remainder of this report, the full name ‘OECD Labour Force Statistics’ and the abbreviation ‘LFS’ are used interchangeably.
2 Definitions and main data source

In this chapter we describe the self-employment (business ownership) definition used in COMPENDIA, i.e., which groups of workers are included in the self-employment count? We also mention the industry groups covered in COMPENDIA and we give a short overview of harmonization problems that have to be solved. Finally, we describe how business ownership data are scaled in COMPENDIA. We start this chapter with a description of self-employment data in OECD Labour Force Statistics.

Self-employment data in OECD Labour Force Statistics
OECD Labour Force Statistics forms the basis for our data set on the number of self-employed per country. In this yearly publication, in the chapter Country Tables, for every country there is a table called ‘Civilian Employment’. In this table, total employment is divided in three professional statuses: a) wage earners and salaried employees, b) employers and persons working on own account, and c) unpaid family workers.

In principle, we use the category ‘employers and persons working on own account’. At all events, this category includes all unincorporated self-employed individuals (sole proprietors and partners). However, as far as incorporated self-employed are involved (owner/managers of incorporated businesses), there is a uniformity problem. In some countries they are counted as self-employed and in other countries they are counted as employee. The latter case may prevail because formally, owner/managers of incorporated businesses are employees of their own businesses. The different statistical treatment of incorporated self-employed in different countries forms the main harmonization problem to be dealt with in COMPENDIA, and we shall discuss this problem in detail in chapter 3.

In LFS, professional status applies to the primary activity of a person. For example, a person who works as an employee in some business for four days a week, and runs his own business for one day a week (i.e., the person is self-employed as secondary activity) is counted in the a)-category rather than in the b)-category mentioned above. In other words, the data in the professional status classification in LFS relate to the main job. In COMPENDIA, we follow this practice and we exclude the so-called side owners (secondary activity) from our self-employment count.

Which groups of workers are included in COMPENDIA?
In constructing a data set on numbers of self-employed, we have to decide which groups of workers are included in the self-employment count, and which are not. In particular, we have to deal with the following two cases: unpaid family workers and owner/managers of incorporated businesses. In some studies, these groups of workers are counted as self-employed, and in other studies they are counted as employees. As regards unpaid family workers, we consider these workers not relevant for measuring the extent of ‘entrepreneurship’. These people do not own the business they work for, and thus do not bear responsibility and risk in the same way as ‘real’ self-employed individuals do. We exclude this group of workers from our self-employment count.

1 In LFS version 1981-2001, the table is called ‘Professional status and breakdown by activities’.
2 The minimum weekly amount of time that a person has to work in order to be included in the (self-) employment count of LFS is one hour (OECD 2002, pp. xi-xii).
As regards owner/managers of incorporated businesses, we do consider this group as highly relevant, because in an 'entrepreneurial' sense, this group is not essentially different from the unincorporated self-employed. We include the incorporated self-employed in our self-employment definition.

**Which industry groups are covered in COMPENDIA?**

In LFS, the employment status division is applied separately for the agriculture, hunting, forestry and fishing industries on the one hand and the 'non-agricultural activities' on the other hand. The agricultural industries are structurally different from the rest of the economy, in that self-employment is the natural employment status in these industries. For practical reasons, we exclude the agricultural industries from our self-employment count and concentrate on the numbers of self-employed in the non-agricultural industries.

Summarizing, we use the following macro self-employment (business ownership) definition in the data set COMPENDIA 2000: **the total number of unincorporated and incorporated self-employed outside the agriculture, hunting, forestry and fishing industries, who carry out self-employment as their primary employment activity.**

We use the terms business owners and self-employed interchangeably, to indicate that we also include owner/managers of incorporated businesses in our self-employment notion.

**Harmonizing the OECD Labour Force Statistics data**

In constructing a harmonized data set for the number of business owners across countries and over time, two types of comparability problems can be identified. The first problem involves comparability across countries, i.e., different countries using different self-employment definitions. Having chosen a self-employment definition to be used in our data set COMPENDIA, we have to adjust the raw LFS data for those countries which use a different definition in LFS. The corrections that we apply mainly involve corrections for the numbers of incorporated self-employed in certain countries. We aim at applying the same method for each country to ensure comparability. This general method is described in chapter 3.

The second problem involves comparability over time, i.e., the occurrence of trend breaks in LFS. A trend break may occur if the set-up of the labour force survey in a country changes from a certain year onwards. Also changes in self-employment definitions over time or changes in industrial classifications may introduce trend breaks. These trend breaks are corrected for in COMPENDIA and the corrections are described in chapters 4 (United States) and 5 (remaining countries). These chapters also describe the details for each country of applying the general method of chapter 3.

**Scaling the business ownership data**

In order to compare self-employment figures across countries in a meaningful way, some form of scaling must be applied. A common scaling variable is the size of the labour force. In COMPENDIA, the number of self-employed (business owners) in a coun-

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1 The ‘agricultural industries’ are thus defined to include agriculture, hunting, forestry and fishing.

2 An alternative scaling variable is ‘total employment’. This was used by Wennekers and Folkeringa (2002).
try as a fraction of total labour force is indicated as the country's business ownership rate. Data on total labour force are also obtained from OECD Labour Force Statistics. For this variable, comparability problems of the raw LFS figures across countries and over time occur less often than for the variable self-employment. However, in some cases, corrections were still needed, and these are described in chapter 6.
3 Measuring business ownership: general methods

In this chapter we give a general description of the data collection and data construction of the number of business owners for the 23 countries in the database, for the period 1972-2000. Country-specific details will be described in chapters 4 and 5. As mentioned in chapter 2, our business ownership definition includes unincorporated self-employed as well as owner/managers of incorporated businesses (OMIBs). We exclude the agricultural sectors of economy. In principle, we use the reported numbers under the item 3b (non-agricultural activities; employers and persons working on own account), under table III: Civilian Employment (or, in the most recent versions, Professional Status), of the various country tables in OECD Labour Force Statistics. At all events, this item includes all unincorporated self-employed. However, the extent of inclusion of OMIBs in the reported numbers varies per country, due to different set-up of labour force surveys in different countries. This involves issues as whether classification in employment status categories is done by the interviewer or by the respondent, the degree of guidance that is given by the interviewer on the term ‘self-employment’, the number of categories which respondents can choose from, etc. For details on these labour force surveys, see OECD (2000), Annex 5A.

Estimating the 1994 level of the number of OMIBs

The countries thus differ in the extent to which OMIBs are included in the official statistics. In OECD Employment Outlook June 2000, p. 158, countries are categorized in five types as regards the inclusion of OMIBs in OECD Labour Force Statistics:
1. excluding (all) OMIBs,
2. classification of OMIBs is unclear,
3. including (all) OMIBs,
4. including most OMIBs,
5. excluding most OMIBs.

It is clear that our desired definition is the third one: including (all) OMIBs. For countries not following this definition, i.e., those countries which are categorized as 1), 2), 4), or 5), we make an estimation of the number of OMIBs in 1994 using the following procedure.

Estimation procedure for European countries in COMPENDIA

We use as the total number of business owners (unincorporated as well as incorporated self-employed) the maximum of:
a) the reported number of self-employed in the OECD Labour Force Statistics 1981-2001, and
b) the number of ‘non-primary private enterprises’ with less than 50 employees, from the data base that is constructed in the framework of The European Observatory for SMEs: Sixth Report (KPMG/ENSAR 2000). This data base is largely based on the Eurostat publication Enterprises in Europe, which contains harmonized information for the 18 European countries in our COMPENDIA data set on (among other variables) the number of enterprises, by industry and size class.

1 The term ‘non-primary’ is defined to exclude agriculture, hunting, forestry and fishing.
We use the number of enterprises with less than 50 employees because in larger companies the manager often does not have the control. Formally, this control rests with the shareholders. A second reason for not including all firms in the estimated number of business owners is that not all firms are independent. Dependent firms (subsidiary companies) by definition are not linked to self-employed individuals. By using the number of enterprises smaller than 50 employees, we do not take account of the fact that partnerships have more than one self-employed individual, and on the other hand, that individuals can have more than one corporation or that individuals can run a business as a side activity (second job). However, the number of enterprises smaller than 50 employees should approximately equal the number of business owners, by and large.

The comparison is made for the year 1994. In case the number of enterprises exceeds the reported number of ‘employers and persons working on own account’, as reported by OECD Labour Force Statistics, we can derive a raise factor that corrects for the number of OMIBs. In principle, for such countries we apply this raise factor constantly, for the whole period 1972-2000. For those 1)-, 2)-, 4)-, or 5)-categorized countries for which the reported number of business owners in the OECD Labour Force Statistics exceeds the number of enterprises, we then choose the number of LFS-reported business owners. Because such a country does not belong to category 3), we know that such an estimate does not include all OMIBs. But we also know that the number of enterprises is lower, and therefore we argue that it is likely that the vast majority of the OMIBs is included in the reported LFS number.

Estimation procedure for non-European countries in COMPENDIA
For the five non-European countries in COMPENDIA, we look again at the categorization in OECD Employment Outlook June 2000. The above-mentioned European Observatory for SMEs does not contain data on non-European countries. Therefore, in case the categorization is not ‘3) including (all) OMIBs’, we must estimate the number of OMIBs in another way. We use country-specific sources and we refer to chapter 4 and the country sections in chapter 5 for a description. In all cases we apply a procedure that resembles the procedure for the European countries as closely as possible.

Expert knowledge
For all countries in our data set it holds that we deviate from the above procedures in case we dispose of ‘expert knowledge’, i.e., additional information from other sources. This is the case for the Netherlands, Iceland, Switzerland, and New Zealand. For the estimation of the number of OMIBs of these countries we refer to the respective country sections in chapter 5.

Is the development over time of numbers of OMIBs measured independently?
In table 1, the number of business owners including statistically non-identified OMIBs is estimated for 1994. For some countries this results in a raise factor that corrects (for) the number of OMIBs. In principle, the raise factor is applied constantly, for the whole period 1972-2000. In a small number of countries, the implicit assumption is that the development over time of the number of incorporated self-employed (ISE; or OMIBs) equals that of the number of unincorporated self-employed (USE). This may be an implausible assumption as the development over time of the numbers of these two groups
may be quite different over such a long period of time. This is not a desirable characteristic of using such a procedure.\(^1\)

However, for the majority of countries the actual assumption that lies behind our method of estimating the number of OMIBs, is not so strong. For example, when a country is categorized as ‘including most OMIBs’, the development over time of ‘most’ OMIBs is included in the published numbers of OECD Labour Force Statistics. The actual assumption that we make when applying a point estimate of the raise factor constantly for the whole period, is that the proportion of non-identified OMIBs in the total number of business owners stays constant over time, and this is a less strong and hence more plausible assumption.

Additionally, for the United States, we use independent information on the number of OMIBs for the whole period 1972-2000. The only assumption we make is that the quotient (employer firms)/(self-reported incorporated self-employed according to Current Population Survey) stays constant over the period 1972-1986 (see chapter 4). This is not such a strong assumption, and hence the development over time of the number of estimated OMIBs for the US may be considered reliable.

In table 1 we give an overview of the results of applying the (missing) OMIBs estimation procedure described in this chapter. The number of enterprises is reported only when it is needed in the OMIB estimation procedure of that country. Hence, the number is not reported for countries with categorization ‘including all OMIBs’, or for countries where ‘expert knowledge’ is used. The number of enterprises is also not reported for the non-European countries. In principle, the mentioning of a raise factor for a country in the last column of table 1 implies that the factor is applied constantly for the whole period 1972-2000. However, in three cases (the Netherlands, United States and Japan), the raise factor is mentioned only for illustrational purposes.

In chapters 4 and 5 we shall describe the business ownership times series of each country in full detail.

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\(^1\) Note that for countries where the 1994 number of business owners in LFS exceeds the number of enterprises smaller than 50 employees, i.e., countries that use the reported LFS numbers, the development over time of the number of ISE is measured independently of the development of the number of USE.
Table 1  Estimating the number of business owners including all OMIBs in 1994 for 23 OECD countries (all numbers expressed in thousands)  

<table>
<thead>
<tr>
<th>Country</th>
<th>OMIB-categorization in OECD</th>
<th>1. Number of business owners in OECD Labour Outlook June 2000</th>
<th>2. Number of enterprises smaller than 50 employees</th>
<th>3. Number of business owners (1994) used in COMPENDIA 2000.2</th>
<th>Raise factor OMIBs (3./1.; only if 3.&gt;1.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Austria</td>
<td>Unclear</td>
<td>230</td>
<td>281</td>
<td>281</td>
<td>1.22</td>
</tr>
<tr>
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<td>Incl. all</td>
<td>498</td>
<td>498</td>
<td>498</td>
<td></td>
</tr>
<tr>
<td>Denmark</td>
<td>Incl. most</td>
<td>161</td>
<td>164</td>
<td>164</td>
<td>1.02</td>
</tr>
<tr>
<td>Finland</td>
<td>Incl. most</td>
<td>193</td>
<td>167</td>
<td>194</td>
<td></td>
</tr>
<tr>
<td>France</td>
<td>Incl. most</td>
<td>1817</td>
<td>2293</td>
<td>2293</td>
<td>1.26</td>
</tr>
<tr>
<td>Germany</td>
<td>Incl. most</td>
<td>2938</td>
<td>3070</td>
<td>3070</td>
<td>1.04</td>
</tr>
<tr>
<td>Greece</td>
<td>Incl. most</td>
<td>840</td>
<td>555</td>
<td>840</td>
<td></td>
</tr>
<tr>
<td>Ireland</td>
<td>Incl. most</td>
<td>145</td>
<td>72</td>
<td>162</td>
<td></td>
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<tr>
<td>Italy</td>
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<td>3681</td>
<td>4117</td>
<td>1.10</td>
</tr>
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<td>11.8</td>
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<td>1.10</td>
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<tr>
<td>The Netherlands</td>
<td>Incl. most</td>
<td>596</td>
<td>699</td>
<td>699</td>
<td>1.17 (^6)</td>
</tr>
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<td>2052</td>
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<td></td>
</tr>
<tr>
<td>Sweden</td>
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<td>340</td>
<td>335</td>
<td>340</td>
<td></td>
</tr>
<tr>
<td>United Kingdom</td>
<td>Incl. most</td>
<td>3002 (^3)</td>
<td>3136</td>
<td>3170</td>
<td>1.04</td>
</tr>
<tr>
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<td>18.1</td>
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</tr>
<tr>
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<td>168</td>
<td>168</td>
<td>1.45</td>
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<td>N.A.</td>
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<tr>
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<td>Excl. all</td>
<td>8955</td>
<td>13929</td>
<td>13929</td>
<td>1.56 (^6)</td>
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<tr>
<td>Japan</td>
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<td>6950</td>
<td>1.13 (^6)</td>
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<td>1493</td>
<td>1.52</td>
</tr>
<tr>
<td>New Zealand</td>
<td>Unclear</td>
<td>226</td>
<td>226</td>
<td>226</td>
<td></td>
</tr>
</tbody>
</table>

1 Data on number of enterprises taken from The European Observatory for SMEs: Sixth Report; estimation of OMIBs for non-European countries based on country-specific sources. Finland and Ireland: 1994 number of business owners in COMPENDIA 2000.2 adjusted for post-1994 trend breaks. 
2 Expert knowledge: estimation of number of OMIBs deviates from usual procedure. 
4 Including unpaid family workers. 
6 Raise factor not used to construct the data, and only mentioned for purpose of illustration.
4 Measuring business ownership in the United States

As regards the number of self-employed individuals in the United States, many different sources report different figures. The official self-employment definition as practiced by the Bureau of the Census in its Current Population Survey (CPS) excludes the incorporated self-employed. The definition thus only includes the unincorporated self-employed which consist of sole proprietors and partners, see the United States Small Business Administration (SBA), (1997), p. 87.1 As we also include the incorporated self-employed (ISE) in our COMPENDIA definition, we had to resort to other sources as regards the number of ISE.

The organization of this chapter is as follows. In the first section we discuss reported figures on (unincorporated) self-employed in various sources. Our estimation of the number of ISE is discussed in section 4.2. This section also includes a discussion on some specific measurement problems concerning ISE. Next, we present our business ownership series for the US, and we provide some explanation for the different developments over time of numbers of unincorporated and incorporated self-employed. In the final section we provide a discussion on the big differences between numbers of self-employed according to labour force surveys and numbers of businesses according to tax return data.

4.1 Unincorporated self-employed

To illustrate the variety of figures on the self-employed, we consider the number of self-employed in 1994 (in thousands). According to OECD (2002), the number of non-agricultural self-employed is 8955. According to SBA (1997), p. 88, table 3.1, which is taken from the source Statistical Abstract of the United States and which corresponds to Bregger (1996), p. 4, table 1, the number is 9003. Finally, according to SBA (1997), p. 90, table 3.3, which is a tabulation by Carolyn Looff and Associates based on unpublished CPS data, the number is 8856 (unincorporated self-employed). See table 2a. In the present report, the sources Bregger (1996) and Carolyn Looff and Associates (as reported in SBA, 1997) will henceforth be abbreviated as Bregger and Carolyn Looff.

Table 2a Number of non-agricultural self-employed in 1994, according to different sources

<table>
<thead>
<tr>
<th>Source</th>
<th>Reported self-employed 1994 (000s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Carolyn Looff and Associates, as reported in SBA (1997)</td>
<td>8856</td>
</tr>
<tr>
<td>Statistical Abstract of the United States, as reported in</td>
<td></td>
</tr>
<tr>
<td>SBA (1997)/Bregger (1996)</td>
<td>9003</td>
</tr>
</tbody>
</table>

* Unincorporated self-employed, primary activity, excluding unpaid family workers.

1 People who are self-employed as a secondary activity (side owners) are also not included in the Census definition; see SBA (1997), p. 87.
At first sight, table 2a is confusing. Three sources which claim to report the number of non-agricultural self-employed in 1994, all report (slightly) different figures. If we take a closer look, the differences can be explained through. One problem is the industrial classification of the agricultural sector. All three sources claim to report the number of self-employed in the ‘non-agricultural’ industries. However, OECD Labour Force Statistics (LFS) and Carolyn Looff actually refer to ‘agriculture’ in broad sense. That is, they do not only exclude the agricultural sector, but also the hunting, forestry and fishing sectors. Bregger, on the other hand, excludes only the agricultural sector proper. Indeed, Bregger and LFS actually use the same source, the Current Population Survey. Both sources report the same number of self-employed (and also the same number of total employed) for all industries, namely. Only the division between the agricultural and non-agricultural sectors differs. So, the difference between 9003 (Bregger) and 8955 (LFS) actually represents the number of self-employed workers in the hunting, forestry and fishing sectors. Because we use the sector definition of LFS, the figure of Bregger is inappropriate for our purposes. In other words, we work with the broad definition of agriculture.

We have now found the explanation for the difference between Bregger and LFS. But why does Carolyn Looff also deviate from LFS? Both work with the same agriculture definition and both work with CPS data. An explanation might be that Carolyn Looff reports data from the month March, while LFS reports year averages. In March, the demand for workers is on average lower than for instance in the holiday months July and August. This might be an explanation for the lower figures of Carolyn Looff (the total employment figure is also lower than that of the LFS). In table 2b, the possible explanations for the different figures are summarized.

<table>
<thead>
<tr>
<th>Source</th>
<th>Non-agricultural self-employed 1994 (000s)</th>
<th>Definition ‘Agriculture’</th>
<th>Time of survey</th>
</tr>
</thead>
<tbody>
<tr>
<td>OECD LFS 1981-2001</td>
<td>8955</td>
<td>Broad (incl. hun, for, fish)</td>
<td>Year average</td>
</tr>
<tr>
<td>Carolyn Looff</td>
<td>8856</td>
<td>Broad</td>
<td>March</td>
</tr>
<tr>
<td>Bregger</td>
<td>9003</td>
<td>Narrow</td>
<td>Year average</td>
</tr>
</tbody>
</table>

4.2 Incorporated self-employed

In the previous section we saw that there is some confusion about the numbers of unincorporated self-employed persons. The confusion gets even bigger if we want to measure the number of incorporated self-employed, i.e., the number of owner/managers of incorporated businesses. As mentioned earlier, this type of self-employment is excluded from the figures in official statistics. As a result, information on the numbers of owner/managers is hard to find. However, there are two sources which report more or less comparable figures on the subject. These are again Bregger (1996) and Carolyn Looff, as reported in SBA (1997), p. 90. In SBA (1997), p. 91, it is reported that the number of incorporated self-employed (the owner/managers) increased with 40% be-

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1 For LFS, we can deduce that this is indeed the case from the observation that the totals for the whole economy are divided between agriculture, hunting, forestry and fishing on the one hand and ‘non-agricultural activities’ on the other hand. For Carolyn Looff we can deduct the same thing from a related Carolyn Looff-table with an industrial classification of the ‘non-agricultural’ sectors which does not include the hunting, forestry and fishing sectors; see SBA (1997), pp. 92-93, table 3.4.
between 1976 and 1979 and with 33.3% between 1979 and 1983. Bregger, p. 8, reports that the number of self-employed owners of incorporated businesses rose from 1.5 mln in 1976 to 2.1 mln in 1979 and to 2.8 mln in 1982. Note that these figures correspond to the 40% and 33.3% increases as reported in SBA (1997). However, it is clear from the latter source that the 33.3% increase relates to a four-year period and not to a three-year period. So, we have a figure of 2.8 mln for all industries (including the agricultural sectors) in 1982 according to Bregger. In SBA (1987), p. 114, table 4.3 - which is the same type of tabulation as the one of Carolyn Looff in SBA (1997), p. 90 - a number of 2.59 million of incorporated self-employed (ISE) in May 1983 is reported for all non-agricultural industries. These figures seem to match quite well. Indeed the ratio 2.59/2.8 (non-agricultural ISE/total ISE) closely resembles the corresponding ratio for 1989 that can be derived from Bregger, p. 8, table 5. Therefore, in order to construct a series of the number of incorporated self-employed between 1976 and 1994, we use the figures for 1983, 1988 and 1994 as provided by SBA (1987), p. 114, table 4.3, and SBA (1997), p. 90, table 3.3 (these two tabulations are consistent), and for 1976 and 1979 we apply the 40% and 33.3% increase figures to the 1983 figure of 2.59 mln. We can even go back until 1967. For 1967, Fain (1980), p. 7, reports a number of 850,000 incorporated self-employed. This figure is consistent with the figures for 1976 and 1979 reported by Bregger (1996). In order to correct for the agricultural owner/managers we again apply the relative growth rate (1.5/0.85 between 1967 and 1976, an increase of 76.4%) in order to arrive at an estimate of the number of non-agricultural incorporated self-employed in 1967. See table 3.

Table 3  Incorporated self-employed (non-agricultural), 1967-94, preliminary times series

<table>
<thead>
<tr>
<th>Year</th>
<th>Number (000s)</th>
<th>Source / method</th>
</tr>
</thead>
<tbody>
<tr>
<td>1967</td>
<td>786</td>
<td>Increase 76.4% 1967-76, reported by Fain (1980)</td>
</tr>
<tr>
<td>1976</td>
<td>1388</td>
<td>Increase 40.0% 1976-79, reported by SBA (1987), p. 112</td>
</tr>
<tr>
<td>1979</td>
<td>1943</td>
<td>Increase 33.3% 1979-83, reported by SBA (1987), p. 112</td>
</tr>
</tbody>
</table>

Source: Own calculations, based on SBA.

Underestimation of numbers of owner/managers
Although with help of data reported in SBA (1987 and 1997) we have been able to produce some preliminary figures for the number of owner/managers, it is important to note that these figures actually understate the real number of owner/managers. This is

1 The 33.3% increase actually relates to the period 1978-82 instead of 1979-83, and to all industries; see SBA (1987), p. 112, table 4.2. Because the period analysed in that table is 1979-83, the relative changes were assumed equal for the two periods.

2 Actually, the ratio in Bregger is a bit higher. One possible explanation is that agriculture has become less important between 1982/83 and 1989. Another one is that the non-agricultural industries are more broadly defined in Bregger, as discussed earlier.

3 From 1967 on, because of a change in the Current Population Survey in that year, it is possible to identify those workers who report themselves as self-employed but have incorporated their business. Before 1967, these workers could not be identified separately from other self-employed individuals. See Bregger (1996), p. 4, and Fain (1980), p. 7.
because legally, these workers are employees of their own businesses. Now, in the labour force survey, people are asked whether they are employed by a government, a private company or a non-profit organization (in which cases they are classified as wage and salary workers) or whether they are self-employed. In the latter case, the following question is asked: ‘Is this business incorporated?’ The people who answer ‘yes’ are still classified as wage and salary workers in the official statistics. It is these figures (the numbers of people who answer ‘yes’ on the incorporated business question) that are tabulated in SBA (1987 and 1997) and which figures we have taken over in table 3. However, not all incorporated self-employed are detected by the extra question. Owner/managers who answer that they are wage and salary workers (because legally this is the case) are not identified as self-employed workers because no extra question is asked to people who respond that they are employed by a private company. So the reported numbers of incorporated self-employed only relate to people who responded (erroneously, for the purposes of the labour force survey) that they are self-employed. The figures do not include the owner/managers who (correctly, for those purposes) identify themselves as wage and salary workers. These owners cannot be identified. For more details about these questionnaires, see Bregger, p. 8, SBA (1997), p. 113, and OECD (2000), Annex 5A.

So, the reported figures are actually an understatement of the real number of incorporated self-employed. However, the magnitude of the understatement is unknown, see Fain (1980), p. 7: ‘Another group which cannot be separated and studied are those incorporated self-employed who report themselves initially as wage and salary employees. There is no way to determine how large this group might be or to know whether it has grown larger or smaller over time’.

The problem of the unidentified owner/managers who report themselves as wage and salary worker seems to prevail not only in the United States but also in other OECD countries. This is because in general, statistical definitions are based on legal employment statuses, see Hakim (1988), p. 422: ‘Working proprietors or managers of incorporated businesses are classified as employees in statistical surveys, because that is their status in law and for tax and social insurance purposes. However, these distinctions are not necessarily observed by respondents to the labour force surveys that provide the main source of data on self-employment, and errors cannot always be detected and corrected by statistical offices.’ So, because the official status of owner/managers is that of employee, labour force surveys do not bother to ask respondents who report themselves as employees whether or not they own an incorporated business. Therefore, their numbers are unknown, as Hakim (1988), p. 423, reports: ‘And we do not have any idea how many more working proprietors and managers of their own incorporated businesses are invisible in the statistics because they classified themselves - according to the rules - as employees of their own small firm’.

While Fain (1980) and Hakim (1988) in principle report on the particular measurement problems in the United States and the United Kingdom, respectively, the problems prevail in many other (if not all) OECD countries as well. See for example OECD (1992), p. 185: ‘Data on the numbers of owner-managers of incorporated businesses are not widely available. In addition, their propensity to report themselves as self-employed is unknown’. This implies that those owner/managers who report themselves as employee are not identified, consistent with Fain (1980) and Hakim (1988). See also OECD (2000), Annex 5A.
Correction based on number of employer firms
Because we want to obtain a plausible estimate of the number of incorporated self-employed, and we know that the series from table 3 is too low, we make a correction on these series. For this purpose we use the number of employer firms, as yearly published in *The State of Small Business, A Report of the President*, see for example SBA (1998a), p. 118, table A9, and SBA (1999), p. 205, table A5. The number of employer firms is a conventional estimate for the number of OMIBs. See SBA (2000), p. 5: ‘Incorporated self-employment is generally defined as an employer firm [...]’. In *The State of Small Business, A Report of the President*, the number of ‘non-farm’ employer firms is published each year, both by size class and by industry.\(^1\) Because we work with the broad definition of agriculture, we subtract the number of employer firms in the industry ‘Agricultural services, Forestry, and Fishing’ from the total number of ‘non-farm’ employer firms. Next, because we try to use a method for the United States that is as uniform as possible with the method for the European countries, we take only the employer firms that are smaller than 50 employees.\(^2\) This leads to the series in table 4 below.

Table 4 Estimated number of incorporated self-employed (non-agricultural) in US, 1988-2000, based on number of employer firms (thousands)

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Inc. SE</td>
<td>4690</td>
<td>4789</td>
<td>4808</td>
<td>4974</td>
<td>5157</td>
<td>5408</td>
<td>5528</td>
</tr>
</tbody>
</table>


As we see from table 4, the number of employer firms is measured from 1988 onwards. We have no information on the number of employer firms before that year. Therefore, for the year 1988, we compute the ratio employer firms/incorporated self-employed according to the labour force survey (see table 3) and apply this factor to the series in table 3 (for the years prior to 1988). The ratio equals 4690/2984 ≈ 1.57. The implicit assumption is that about two third of the OMIB-respondents in the labour force survey classify themselves as self-employed while one third classify themselves as wage and salary employees. This seems a plausible assumption.\(^3\)

4.3 Total number of self-employed
Having constructed a series for the incorporated self-employed, we are now able to construct a series for the total self-employed, according to our definition (all incorporated and unincorporated self-employed but excluding the agricultural sectors, the second jobs and the unpaid family workers). Our series runs from 1972 to 2000. For the

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1 The term ‘farm’ relates to agriculture in narrow sense here, compare section 4.1.

2 For this purpose the number of firms with employment size between 19 and 50 is approximated at 75% of the firms with size between 19 and 100.

3 In a description of labour force surveys in different countries, OECD (2000), p. 192, states that ‘It is assumed that when the procedure is self-assessment alone, OMIBs will mainly classify themselves as self-employed’. 

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For the incorporated self-employed (ISE) we use the series from table 4 for 1988 and later years, and the series from table 3, with the correction factor applied to it, for the years prior to 1988. For the years between 1972 and 1988 that are not reported in table 3, we interpolate. This results in the series are presented in table 5.

Table 5  Total number of US non-agricultural self-employed, 1972-2000 (thousands)

<table>
<thead>
<tr>
<th>Year</th>
<th>USE (OECD LFS)</th>
<th>ISE, uncorrected (see table 3)</th>
<th>ISE, corrected (see table 4 for 1988-2000, and apply factor 1.57 for 1972-86)</th>
<th>Total self-employed</th>
<th>Labour force (OECD LFS)</th>
<th>Business ownership rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>USE</td>
<td>5342</td>
<td>5754</td>
<td>6956</td>
<td>7748</td>
<td>8474</td>
<td>8955</td>
</tr>
<tr>
<td>ISE, uncorrected</td>
<td>1120</td>
<td>1388</td>
<td>2104</td>
<td>2669</td>
<td></td>
<td></td>
</tr>
<tr>
<td>ISE, corrected</td>
<td>1761</td>
<td>2181</td>
<td>3308</td>
<td>4195</td>
<td>4690</td>
<td>4974</td>
</tr>
<tr>
<td>Total self-employed</td>
<td>7103</td>
<td>7935</td>
<td>10264</td>
<td>11943</td>
<td>13164</td>
<td>13929</td>
</tr>
<tr>
<td>Labour force (OECD LFS)</td>
<td>88847</td>
<td>97826</td>
<td>108544</td>
<td>115241</td>
<td>123378</td>
<td>132474</td>
</tr>
<tr>
<td>Business ownership rate</td>
<td>0.080</td>
<td>0.081</td>
<td>0.095</td>
<td>0.104</td>
<td>0.107</td>
<td>0.105</td>
</tr>
</tbody>
</table>

Source: Own calculations.

Different trends for incorporated and unincorporated business owners
From table 5, we see that the number of incorporated self-employed (ISE) has increased faster than the number of unincorporated self-employed (USE). For example, in the period 1980-2000, the number of ISE increased with an average of 2.6% per year. In the same period the average annual growth of the number of USE was 1.1%. Apparently, more self-employed individuals choose for incorporation of their business. Why does this occur? There can be many reasons, as Fain (1980), p. 7, reports: ‘The move towards incorporation is a function of many complex factors. A worker will usually incorporate his business for traditional benefits of the corporate structure, including limited liability, tax considerations, and the increased opportunity to raise capital through the sale of stocks and bonds’. Simply put, when an unincorporated business expands, it becomes more attractive to incorporate the business. So, when small businesses perform well and expand, they will often choose for incorporation. In that case, however, the status of the entrepreneur in the official statistics changes from self-employed to employee. See Bregger, p. 8: ‘What undoubtedly occurs is that, as the small businesses expand and bring on employees, the owners incorporate their businesses, thereby shifting the class-of-worker classification to wage and salary employment. This type of transitional shuffling, while not readily measurable, is very likely an ongoing event […]’.

From the previous paragraph, it is clear that data on USE alone can be misleading. For example, if the number of USE stays constant or decreases, one cannot tell whether this is because business ownership really decreases, or whether many small businesses have incorporated their business and as a result are not considered self-employed any more in official statistics. Formulated otherwise, if the number of USE decreases, one cannot tell whether the ‘real’ degree of business ownership is affected as well. The above example underlines the importance of including the owner/managers of incorporated businesses in the self-employment count.

4.4 Inconsistency of self-employment data and business stock data

As has become clear from the previous discussion, there are many difficulties in measuring the number of business owners. Another intriguing statistical problem is linking the number of business owners to the number of businesses. For the United States, striking differences exist between data on the number of self-employed and data on the number of businesses. Business data are collected by the Internal Revenue Service of the U.S. Department of the Treasury (IRS). In table 6, we report for 1994 the number of businesses per type of business from IRS (number of business tax returns), as reported by SBA (1997), p. 25, and the number of self-employed per type of self-employed from Carolyn Looff and Associates, as reported by SBA (1997), p. 90.

Table 6 1994 comparison of business data (IRS) and self-employment data

<table>
<thead>
<tr>
<th>Businesses (IRS)</th>
<th>Number (000s)</th>
<th>Self-employed (Carolyn Looff)</th>
<th>Number (000s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Corporations</td>
<td>4667</td>
<td>Incorporated self-empl.</td>
<td>3955</td>
</tr>
<tr>
<td>Partnerships</td>
<td>1558</td>
<td>Unincorporated self-empl.</td>
<td>8856</td>
</tr>
<tr>
<td>Proprietors</td>
<td>15831</td>
<td>Self-employed as second job*</td>
<td>2539</td>
</tr>
<tr>
<td>Total</td>
<td>22056</td>
<td>Total</td>
<td>15350</td>
</tr>
</tbody>
</table>

* In the tabulation of Carolyn Looff this group is called Wage-and-Salary Workers with Self-Employment (WSSE).

In SBA (1987), p. 135, two explanations are put forward for the differences between IRS data on the number of businesses and the CPS data on the number of business owners: ‘First, self-employed persons with more than one business are counted only once in the CPS, but all reporting businesses are included in IRS counts. Second, all movement into self-employment during the year is counted in the IRS survey, while the CPS provides only a snapshot view of the month of May’.

### Difference Corporations/Incorporated Self-Employed

Regarding the first row of table 6 (corporations versus incorporated self-employed), the gap between the number of corporations and the number of incorporated self-employed individuals might be explained more or less satisfactorily by the explanations already mentioned, and by some other ones. First, people can indeed have more than one corporation. Second, there are corporations without (incorporated) self-employed individuals, like dependent corporations (subsidiary companies). There are also no self-employed in a firm if the majority of the shares is not owned by one (or sometimes two or three) person(s) but if the shares are divided in a great number of smaller shares (for instance, companies with an exchange quotation). Note that, on the other hand, there may also be corporations with more than one incorporated self-employed individual. But in that case, businesses are counted more than once in the IRS survey. As is reported by SBA (1998b), p. 2, about the IRS data: ‘Tax return data include all businesses, but it will overstate the number of businesses when a business files more than one tax return’. So, firms having more than one self-employed individual is not a cause for the differences between the CPS and IRS data. A third explanation for the differences between CPS and IRS data is that there are also incorporated self-employed individuals who are not counted in the CPS as self-employed (because they report themselves as employee of their own business) but whose businesses are counted in the IRS. This is because every business has to pay taxes, so businesses are always counted. Fourth, there is the stock/flow difference as described in SBA (1987), p. 135. All four explana-
tions point in the direction of more corporations in the IRS count than incorporated self-employed individuals in the CPS count. Given that the difference is not extremely large, the figures in the first row of table 6 seem to be more or less plausible.

Difference Proprietorships/Unincorporated Self-Employed
Looking at the second and third row of table 6, the differences between the business figures and the self-employment figures are much larger. If we assume that people who are self-employed as a second job (side owners) do not own incorporated businesses but instead own unincorporated businesses, we can compare the total number of unincorporated businesses (sole proprietorships and partnerships) according to IRS - which is 17,391,000 - with the total number of unincorporated self-employed (first and second jobs) according to Carolyn Looff: 11,395,000. So, there is a huge gap of almost 6 million businesses that are unaccounted for. Looking at the four possible explanations that applied to the difference between the number of corporations and the number of incorporated self-employed individuals, we conclude that only the fourth one also applies to the difference for the unincorporated businesses and self-employed. The other three possible explanations do not apply here, as will now be explained. First, people cannot have more than one unincorporated business since one can bear full liability only once. Second, unincorporated businesses always have at least one self-employed individual. Third, the specific problematic of the hidden incorporated self-employed does not apply to the unincorporated self-employed. So, only the stock/flow argument remains to explain the difference between businesses and self-employment. However, the gap of 6 million is far too large to ascribe to this particular argument.

Conclusion: differences cannot be explained
We conclude that the differences between business statistics and (self-)employment statistics cannot be explained in a satisfactory way, particularly for the unincorporated businesses and self-employed. But what’s more, also publications that report on the number of businesses in the U.S. are not always consistent in themselves. For example, in SBA (1998b), p. 2, there are two tables on the number of U.S. businesses: one from the IRS which reports 23,155,000 non-farm business tax returns in 1996 and one from the Bureau of the Census which reports 17,253,000 businesses in 1992 (all industries). Leaving the reasons for the difference between these two figures out of consideration (two of which are the four-year difference and the possibility of double tax returns in the IRS count), it is at least striking that in the text covering these tables (SBA, 1998b, p. 1), we read: ‘The total number of businesses in the U.S. is not definitely known; however, the figure is believed to be between 13 and 16 million’. These last figures are thus not consistent with the figures in the tables themselves, which are higher. They are however in line with the self-employment figures from Carolyn Looff, see table 6. Apparently, considering the quotation just mentioned, the status of the (high) figures from several business statistics is not clear. In COMPENDIA, however, we are interested in business owners and not in businesses. Despite all the problems and limitations that also exist for the statistics on the number of self-employed persons, the figures from this type of statistics seem to be more consistent than business statistics. We consider the series on the number of self-employed individuals (business owners) that we constructed in table 5 a reasonably reliable estimate. However, we acknowledge that different estimates can be obtained if other data sources or approximation methods are used. As an illustration, we present two alternative series for US self-employment in Annex II.
5 Measuring business ownership in the remaining countries

For all countries, the starting-point for constructing a times series for the period 1972-2000 of the number of business owners is OECD Labour Force Statistics, versions 1981-2001 (years 1982-2000), and 1970-1990 (years 1972-1980), item 'employers and persons working on own account' under 'non-agricultural activities'. Unless otherwise stated, the data from LFS 1981-2001 and LFS 1970-1990 are consistent (i.e., the same numbers are reported for overlapping years), so that we can use both sources next to each other. When trend breaks occur, we take the 2000 figures of LFS as the leading standard, so that the most recent figures in COMPENDIA 2000.2 are consistent with newly published figures in future versions of the Labour Force Statistics. So, in case of trend breaks, we adjust the older data to the more recent data instead of the other way around, unless doing so conflicts with our business ownership definition. Therefore, in the country descriptions below, we start our descriptions in 2000 and then work backwards toward 1972.

5.1 Austria

For Austria, the business ownership times series 1972-2000 has been constructed as follows.
1 We start with constructing a base series. For the years 1986-2000 we directly use the published figures in LFS 1981-2001 (item 'employers and persons working on own account').
2 In 1985 a trend break occurs: for the years earlier than 1985, only the aggregate of the two items 'employers and persons working on own account' and 'unpaid family workers' is reported in LFS 1981-2001 and LFS 1970-1990. Therefore, for the years 1972-1984 we multiply the aggregated LFS figures by the fraction 'employers and persons working on own account' / ('employers and persons working on own account' + 'unpaid family workers') in 1985, to remove the unpaid family workers from the data. This fraction equals 176/(176+53). We now have a base series for the whole period 1972-2000.
3 From table 1 we see that for Austria, the OMIB-categorization in OECD Employment Outlook June 2000 is ‘unclear’. Therefore, we apply the procedure described in chapter 3, to establish the absolute level of business ownership in Austria. This results in a raise factor of 1.22 (see table 1). We multiply the number of business owners from the base series by 1.22, for the whole period 1972-2000, to arrive at our final business ownership times series for Austria.

5.2 Belgium

For Belgium, the business ownership times series 1972-2000 has been constructed as follows.
1 We start with copying the reported numbers in LFS. However, the number of business owners in 2000 is not reported (LFS 1981-2001). We use a simple extrapolation: as the number of business owners has not changed between 1997 and 1999, we set the number of business owners in 2000 equal to the number in 1999.
2 From table 1 we see that for Belgium, the OMIB categorization is ‘including all OMIBs’. This means that we do not have to adjust our series obtained in step 1.

5.3 Denmark

For Denmark, the business ownership times series 1972-2000 has been constructed as follows.
1 We start with copying the reported numbers in LFS. However, the numbers of business owners in 1980 and in 1982 are not reported. The numbers for 1979, 1981, and 1983 are reported though. Therefore, we use the average of 1979 and 1981 to estimate the number of business owners in 1980 and compute the number of business owners for 1982 analogously. We now have a base series for the whole period 1972-2000.
2 From table 1 we see that for Denmark, the OMIB categorization is ‘including most OMIBs’. Therefore, we apply the procedure described in chapter 3, to establish the absolute level of business ownership in Denmark. This results in a raise factor of 1.02 (see table 1). We multiply the number of business owners from the base series by 1.02, for the whole period 1972-2000, to arrive at our final business ownership times series for Denmark.

5.4 Finland

For Finland, the business ownership times series 1972-2000 has been constructed as follows.
1 We start with constructing a base series. For the years 1996-2000 we directly use the published LFS figures.
2 In 1996 a trend break occurs (LFS 1978-1998), due to two revisions of the labour force survey in Finland in 1997 and 1998. The figures for 1996 and 1998 have been corrected according to the revised survey, but prior data are not comparable (OECD 1999, p. 137). However, in the version LFS 1976-1996, an unrevised figure for 1996 has been published, consistent with the pre-1996 figures in LFS 1978-1998. Hence, we can derive a raise factor business owners in 1996 according to LFS 1978-1998/business owners in 1996 according to LFS 1976-1996 and multiply the pre-1996 data with this raise factor (which equals 201/190), assuming that the development was correct. For the years 1988-1994 we multiply the published LFS figures by this raise factor. We now have a base series for the period 1988-2000.
3 In 1987 an important trend break occurs. This break is due to a redefinition of the professional status of employees (OECD 1999, p. 137). In fact, the redefinition involves the inclusion of the (measured) number of OMIBs in the self-employment count, as becomes clear from the following quotation from OECD (1992), p.185:

1This description concerns the series that was constructed for the previous version of our data set, COMPENDIA 2000.1. At the time, LFS 1978-1998 was the most recent version available. In LFS 1981-2001, the data for 1989-1995 have been revised, and the revised numbers for 1990-1994 differ only marginally from COMPENDIA 2000.1. Therefore, we have taken over the COMPENDIA 2000.1 figures for these years.
employees in 1967), from Sweden and Finland (who moved in the other direction in 1987), from Canada and from Germany'.

So, the LFS-reported figure for 1986 is exclusive of OMIBs, and the 1987 figure is inclusive of OMIBs (to be exact, only those OMIBs that report themselves as self-employed). So, we have to construct an adjusted figure for 1986.

a. We start by assuming that the vast majority of the newly included OMIBs in 1987 are in the non-agricultural sectors. This assumption is based on the observed patterns in table 7, which contains the uncorrected figures, i.e., including the trend break. We see that for the agricultural sectors, relative change 1986-1987 does not deviate much from the general development over the period 1985-1988, while for the non-agricultural sectors there is a sudden large increase in 1987. From this we conclude that most measured OMIBs must be in the non-agricultural sectors.

b. Next, we look at the absolute change for the total number of business owners in table 7. For 1987-1988 the change is 0, while for 1985-1986 the change is 2. Therefore, we assume that the change 1986-1987 is 1 (being the average of the annual changes in the adjacent years). This implies that the value for the total number of business owners including OMIBs in 1986 would be 344-1=343. The reported value excluding OMIBs is 327, suggesting that there are 16 (x 1000) OMIBs. For simplicity we assume that these 16 OMIBs are all in the non-agricultural sectors, based on our observation in step 3a. Therefore, we add 16 to the stock of (non-agricultural) business owners in 1986, resulting in a figure of 163 (=147+16). Again, we multiply this figure by 201/190 (see step 2), to arrive at a figure of 172 for 1986.

Table 7 Published numbers of business owners (x 1000) in Finland in the period 1985-1988

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<tbody>
<tr>
<td>Agriculture</td>
<td>186</td>
<td>180</td>
<td>171*</td>
<td>160</td>
</tr>
<tr>
<td>Non-agriculture</td>
<td>139</td>
<td>147</td>
<td>173*</td>
<td>184</td>
</tr>
<tr>
<td>Total</td>
<td>325</td>
<td>327</td>
<td>344*</td>
<td>344</td>
</tr>
</tbody>
</table>


To compute the number of business owners in 1984, we use the relative change between 1984 and 1986 according to LFS 1978-1998. We now have a base series for the period 1984-2000.

4 In 1983 there is another trend break. This time there is a change in the classification of the persons of status 'unspecified', see OECD (1999), p. 137. Before 1983 these persons are classified as unpaid family worker whereas from 1983 onwards, these persons are included in 'employers and persons working on own account'. Because we take the more recent figures of LFS as the leading standard, we raise the published number of business owners in 1982 with 13. This is our estimate of the number of 'unspecified' workers, based on the development over time of both groups 'employers and persons working on own account' and 'unpaid family workers', directly before and directly after the trend break. So, to arrive at the COMPENDIA figure for 1982, we multiply the 1984 figure obtained in step 3, by (122+13)/145, 122 and 145 being the LFS-reported figures for 1982 and 1984, respectively. Next, we compute the numbers back to 1978, according to the relative
annual changes reported in LFS. We now have a base series for the period 1978-2000.

5 In 1976 and 1977 there are two more trend breaks. Before 1977, unpaid family workers are included in the item 'employers and persons working on own account', resulting in a break between 1976 and 1977. However, looking at the numbers for 1975 and 1976 there is also a trend break, confirmed by a vertical dash between these two years in LFS 1970-1990. Strikingly, despite these two trend breaks the figures of 1975 and 1977 seem to match quite well, whereas the 1976 figure does not fit at all in the series: the reported numbers for the years 1974-1978 are 110, 106, 153, 112 and 109, respectively. The reasons for the two trend breaks are not clear. Therefore, we simply take the reported numbers for 1974 and 1978 and we multiply our 1978 figure obtained in step 4, by 110/109 to get a figure for 1974. We think this is the most plausible solution. For 1976 we take the average of 1974 and 1978. Finally, the number for 1972 is obtained using the relative change 1972-1974 reported in LFS. We now have a base series for the whole period 1972-2000.

6 From table 1 we see that for Finland, the OMIB categorization is 'including most OMIBs'. Note that the reclassification of OMIBs that was described in step 3 only involves those persons who reported themselves as self-employed; those who classified themselves as employee are not identified. This is the reason that the classification is 'including most OMIBs' instead of 'including all OMIBs'. See also OECD (2000), p. 192, table 5.A.1. Because of the categorization 'including most OMIBs', we apply the procedure described in chapter 3. We see that the LFS figure is higher than the number of enterprises. Therefore, in COMPENDIA, we use the base series obtained in step 5 for the number of business owners in Finland.

5.5 France

For France, the business ownership times series 1972-2000 has been constructed as follows.

1 We start with constructing a base series. For the years 1990-1998 we directly use the published LFS figures.1

2 In 1990 a trend break occurs (LFS 1978-1998). To compute the relative annual change 1989-1990, we make use of OECD National Accounts 1984-1996, p. 303 (table 15: 'employment by kind of activity'). The number of business owners according to this publication can be computed by subtracting the number of employees from the total number of workers. When we exclude agriculture, we get 1943 (x 1000) business owners for 1989 and 1932 business owners for 1990. Because this latter figure seems to be consistent with the revised LFS series from 1990 onwards (the LFS 1978-1998 figure for 1990 is 1926, i.e., very close to 1932), we use the relative annual change 1989-1990 according to OECD National Accounts, i.e., we multiply our 1990 figure by 1943/1932 to get a (non-reported) figure for 1989. Next, we multiply by the relative change 1988-1989 according to LFS 1978-1998 to get a figure for 1988. We now have a base series for the period 1988-2000.

1 This description concerns the series that was constructed for the previous version of our data set, COMPENDIA 2000.1. At the time, LFS 1978-1998 was the most recent version available. In LFS 1981-2001, the complete series for France has been revised (reported self-employment numbers have become lower). Because in our methodology, the level of business ownership in COMPENDIA would not be affected by this revision (see table 1), and because the developments over time are more or less unchanged in the new LFS, we have taken over the COMPENDIA 2000.1 series. For 2000 we have used relative change 1998-2000 according to LFS 1981-2001.
Next, we use relative annual change in the number of business owners, as published in LFS, for the period 1972-1986. We now have a base series for the whole period 1972-2000.

From table 1 we see that for France, the OMIB categorization is ‘including most OMIBs’. Therefore, we apply the procedure described in chapter 3, to establish the absolute level of business ownership in France. This results in a raise factor of 1.26 (see table 1). We multiply the number of business owners from the base series by 1.26, for the whole period 1972-2000, to arrive at our final business ownership times series for France.

5.6 Germany

For Germany, the business ownership times series 1972-2000 has been constructed as follows.

1. We start with constructing a base series. For the years 1992-2000 we directly use the published figures in LFS 1981-2001. In COMPENDIA, numbers prior to 1991 refer to West-Germany (the former FRG), while from 1991 onwards numbers refer to Germany (including the former GDR). In LFS 1981-2001, for the years 1984-1990, unpaid family workers are included in the self-employment count. In LFS 1978-1998 the numbers of self-employed and unpaid family workers are separately available and we use the self-employment numbers from LFS 1978-1998 for these years. We also take 1980 and 1982 from LFS 1978-1998. We now have a base series for the period 1980-2000.

2. In 1980 a trend break occurs. Prior to 1980, the unpaid family workers are included in the number of business owners. We multiply the LFS-reported figures prior to 1980 by the fraction business owners/(business owners+unpaid family workers) from the most recent year for which these two items are separately available (in this case 1980). The fraction equals 1753/(1753+260). We now have a base series for the whole period 1972-2000.

3. From table 1 we see that for Germany, the OMIB categorization is ‘including most OMIBs’. Therefore, we apply the procedure described in chapter 3, to establish the absolute level of business ownership in Germany. This results in a raise factor of 1.04 (see table 1). We multiply the number of business owners from the base series by 1.04, for the whole period 1972-2000, to arrive at our final business ownership times series for Germany.

5.7 Greece

For Greece, the business ownership times series 1972-2000 has been constructed as follows.

1. We start with constructing a base series. For the years 1982-2000 we directly use the published LFS figures.

2. In 1981, a trend break occurs. This involves the inclusion of unpaid family workers in the business ownership count prior to 1981. We correct the LFS numbers using the 1981 fraction of business owners in the sum of business owners and unpaid family workers. The fraction equals 680/(680+104). We multiply the LFS figures for 1978 and 1980 by this fraction. We now have a base series for the period 1978-1998.

3. Prior to 1977, there are no data on the numbers of employers and own account workers in LFS. For 1972-1976, we use information from National Statistical Service
of Greece (NSSG). We apply relative changes in the number of self-employed. We now have a base series for the whole period 1972-2000.

4 From table 1 we see that for Greece, the OMIB categorization is ‘including most OMIBs’. Therefore, we apply the procedure described in chapter 3. We see that the LFS figure is higher than the number of enterprises. Therefore, we use the base series obtained in step 3 for the number of business owners in Greece.

5.8 Ireland

For Ireland, the business ownership times series 1972-2000 has been constructed as follows.

1 We start with constructing a base series. For the years 1998-2000 we directly use the published figures in LFS 1981-2001. In 1998 a trend break occurs. We use the average of relative changes 1996-1997 and 1998-1999 for relative change 1997-1998 and apply this to the 1998 number. Next, we use relative annual changes in the number of business owners, as published in LFS, for the period 1972-1997. We now have a base series for the whole period 1972-2000.

2 From table 1 we see that for Ireland, the OMIB categorization is ‘including most OMIBs’. Therefore, we apply the procedure described in chapter 3. We see that the LFS figure is higher than the number of enterprises. Therefore, in COMPENDIA, we directly take over the LFS-reported business ownership time series for Ireland.

5.9 Italy

For Italy, the business ownership times series 1972-2000 has been constructed as follows.

1 We start with constructing a base series. For the years 1978-1998 we directly use the published LFS figures.

2 In 1977, a trend break occurs. This involves the inclusion of unpaid family workers in the business ownership count prior to 1977. We correct the LFS numbers using the 1977 fraction of business owners in the sum of business owners and unpaid family workers. The fraction equals 3072/(3072+643). We multiply the LFS figures of 1972-1976 by this fraction. We now have a (first) base series for the whole period 1972-1998.

3 In 1993 there is also a trend break, which we did not discuss before. To get a consistent time series for the business ownership rate (i.e., business owners/labour force) it is not strictly necessary to adjust the LFS numbers. This is because the same 1993 trend break also occurs for the labour force series. Nevertheless we choose to adjust both the business ownership series and the labour force series to make the absolute number of business owners also comparable over time. For the labour force series, the adjustment comes down to multiplying all numbers prior to 1993 by 0.951 (see chapter 6 for an explanation). In order to keep the business owner-

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1 This description concerns the series that was constructed for the previous version of our data set, COMPENDIA 2000.1. At the time, LFS 1978-1998 was the most recent version available. In LFS 1981-2001, the series for Italy has been revised from 1993 onwards (reported self-employment numbers have become higher). Because in our methodology, the level of business ownership in COMPENDIA would hardly be affected by this revision (see table 1), and because the developments over time are more or less unchanged in the new LFS, we have taken over the COMPENDIA 2000.1 series. For 2000 we have used relative change 1998-2000 according to LFS 1981-2001.
ship rate unaffected, we also multiply the numbers of business owners prior to 1993 by 0.951. We now have a final base series for the whole period 1972-1998.

From table 1 we see that for Italy, the OMIB categorization is ‘unclear’. Therefore, we apply the procedure described in chapter 3. We see that the LFS figure is higher than the number of enterprises. Therefore, in COMPENDIA, we use the base series obtained in step 3 for the number of business owners in Italy.

5.10 Luxembourg

For Luxembourg, the business ownership times series 1972-2000 has been constructed as follows.

1. We start with constructing a base series. For the years 1992-2000 we directly use the published LFS figures.

2. In 1991 a trend break occurs. We use relative change 1990-1991 from Eurostat Labour Force Survey (non-agricultural employers and self-employed) and apply this to the 1991 number. Next, we use relative annual changes in the number of business owners, as published in LFS, for the period 1972-1990. We now have a base series for the whole period 1972-2000.

3. From table 1 we see that for Luxembourg, the OMIB categorization is ‘unclear’. Therefore, we apply the procedure described in chapter 3, to establish the absolute level of business ownership in Luxembourg. This results in a raise factor of 1.10 (see table 1). We multiply the number of business owners from the base series by 1.10, for the whole period 1972-2000, to arrive at our final business ownership times series for Luxembourg.¹

5.11 The Netherlands

For the Netherlands, the business ownership times series 1972-2000 has been constructed as follows.


2. Next, we use relative changes in the number of self-employed, as published in LFS, for the period 1988-1992. We now have a base series for the period 1988-2000.

3. In 1987, another trend break occurs, due to the introduction of a new labour force survey. Therefore, for the period 1972-1988, information from Dutch National Accounts is used (Statistics Netherlands: ‘CBS Nationale Rekening’). We use relative changes in the labour volume of self-employed, excluding agriculture, forestry and fishing, from tables P21 and P22 of the Dutch National Accounts 1997. We now have a base series for the whole period 1972-2000.

4. From table 1 we see that for the Netherlands, the OMIB categorization is ‘including most OMIBs’. The standard procedure in such a case is to compare the number of self-employed from LFS with the number of enterprises from European Observatory, as described in chapter 3. However, we dispose of additional information from domestic sources, based on which we consider it likely that only a very small

¹ For Luxembourg, the self-employment figures in LFS include unpaid family workers. Using our methodology, the level of business ownership in COMPENDIA is not affected by this; see table 1.
The proportion of OMIBs is included in the LFS figure. Furthermore, from other domestic sources we are able to construct an estimated series of OMIBs. (The level of) this series is based on direct observations on numbers of OMIBs, rather than on firm data. Below, in step 5 we describe why the categorization ‘including most OMIBs’ in OECD Employment Outlook June 2000 is probably not correct, while in step 6 we describe our estimated series for the number of OMIBs.

In OECD (2000), p. 158, the LFS self-employment data for the Netherlands are categorized as ‘including most OMIBs’. In OECD (2000), Annex 5A, the methods behind the OMIB categorization of countries are described. It is explained how household interview surveys underlying the LFS self-employment data are held in each country. From table 5.A.1 at page 192 we see that for the Netherlands there is no ‘verbal or written guidance’ by the interviewer on the meaning of the term self-employment, and there is no ‘separate identification of OMIBs’. The respondent assesses his employment status himself. In those cases, according to note b) at this table, it is assumed that ‘OMIBs will mainly classify themselves as self-employed’. For most countries we are not able to check this assumption, but for the Netherlands we can check it by comparing data from different publications of Statistics Netherlands (CBS). In particular, for the years 1992, 1993 and 1994 the number of self-employed in the (unrevised) Dutch Labour Accounts equal 650, 668, 712 (x 1000; whole economy). The corresponding figures in OECD Labour Force Statistics 1981-2001 are 639, 676 and 727, respectively. So, the difference between these two sources is 2% at most. Furthermore, in the explanatory notes of Dutch Labour Accounts it is stated explicitly that OMIBs are counted as employees, i.e., they are excluded from the self-employment figures. Given that the self-employment numbers in Dutch Labour Accounts are only marginally lower than the numbers in OECD Labour Force Statistics (in fact, for 1992 the number from Dutch Labour Accounts is even higher), it seems likely that at most a very small proportion of OMIBs is included in the LFS self-employment count. Apparently, the assumption that ‘OMIBs will mainly classify themselves as self-employed’, which underlies the OMIB categorization for the Netherlands (‘including most OMIBs’) does not hold for the Netherlands. Therefore, we construct a series for the number of OMIBs independently of the series for self-employed obtained in step 3, and we add both series to get the business ownership series for the Netherlands. This is explained below.

We construct a separate series for the number of OMIBs. The base information for the level of OMIBs is an actual measure of the number of OMIBs in 1988. This number (75,000) is taken from Dutch Income Statistics (‘CBS Inkomensstatistiek’). For the other years developments in the number of incorporated firms or the number of employer firms (firms with employees) are used. For the period 1982-2000 developments of the number of incorporated firms are taken from Dutch Firm Statistics (‘CBS Statistiek van het ondernemingen- en vestigingenbestand’ and its suc-

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1 We do not consider more recent years here, as (self-)employment figures in the Dutch Labour Accounts are not comparable with LFS figures from 1995 onwards. This results from a change in methodology following the integration of the Dutch Labour Accounts (‘CBS Arbeidsrekeningen’) into the Dutch National Accounts (‘CBS Nationale Rekeningen’) in 1998. In general, employment figures have become higher in the revised Labour Accounts. For instance, total employment in 1999 is 4% higher in the revised Labour Accounts compared to OECD Labour Force Statistics (whole economy). Also, in the revised Labour Accounts, household assistants are expected to be self-employed (284,000 in 2000). In COMPENDIA, household assistants are excluded.

2 For the Netherlands, employment figures in OECD Labour Force Statistics are taken from the Dutch Labour Force Survey (‘CBS Enquête Beroepsbevolking’ or EBB). In this survey owner-managers of incorporated businesses are not identified separately.
cessor ‘CBS Bedrijven in Nederland’). For the period 1972-1982 these data were not available, and the developments of the number of employer firms are used, taken from Dutch Income Statistics.

The constructed series for the number of business owners in the Netherlands is presented in table 8.

Table 8 Total number of non-agricultural business owners in the Netherlands, 1972-2000 (x 1000)

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<tbody>
<tr>
<td>Unincorporated self-employed</td>
<td>523</td>
<td>461</td>
<td>448</td>
<td>501</td>
<td>596</td>
<td>756</td>
</tr>
<tr>
<td>OMIBs</td>
<td>63</td>
<td>64</td>
<td>68</td>
<td>83</td>
<td>103</td>
<td>126</td>
</tr>
<tr>
<td>Total</td>
<td>586</td>
<td>525</td>
<td>517</td>
<td>584</td>
<td>699</td>
<td>882</td>
</tr>
</tbody>
</table>

5.12 Portugal

For Portugal, the business ownership times series 1972-2000 has been constructed as follows.

1 We start with constructing a base series. For the years 1990-2000 we directly use the published LFS figures.\(^1\)

2 In 1989, a trend break occurs. This involves the inclusion of unpaid family workers in the business ownership count prior to 1989. We correct the LFS numbers using the 1989 fraction of business owners in the sum of business owners and unpaid family workers. The fraction equals 583/(583+55). We multiply the LFS figures of 1984-1988 by this fraction. We now have a base series for the period 1984-2000.

3 In 1983, a second trend break occurs: prior to 1983, data in LFS refer to end of year and from 1983 on, data refer to annual averages. This makes a big difference (423 employers and own-account workers in 1982 and 539 in 1983, according to LFS). We make a correction by using the average of the relative changes 1981-1982 and 1983-1984 for relative change 1982-1983.

4 For 1972-1982, we use relative changes in the reported LFS figures. For 1978-1982 this is change in the total of employers and own-account workers and unpaid family workers. For 1974-1978 this is change in employers and own account workers only. For 1972-1974, again, change in the total of employers and own-account workers and unpaid family workers. (For Portugal, separate publication in LFS of employers and own-account workers on the one hand and unpaid family workers on the other hand, often changes over time: for the periods 1972-1973 and 1980-1988 only a combined figure is reported, whereas for 1974-1979 and 1989-present, separate figures are reported.) We now have a base series for the whole period 1972-2000.

5 From table 1 we see that for Portugal, the OMIB categorization is ‘unclear’. Therefore, we apply the procedure described in chapter 3. We see that the LFS figure is higher than the number of enterprises. Therefore, in COMPENDIA, we use the base series obtained in step 4 for the number of business owners in Portugal.

\(^1\) In LFS 1981-2001, trend breaks are indicated for 1992 and 1998. As the magnitudes of these breaks do not seem large, we have taken over the published figures without adjustment.
5.13 Spain

For Spain, the business ownership times series 1972-2000 has been constructed as follows.
1. We directly use the published LFS figures, for the whole period 1972-2000.
2. From table 1 we see that for Spain, the OMIB categorization is ‘including all OMIBs’. This means that we do not have to adjust our series obtained in step 1.

5.14 Sweden

For Sweden, the business ownership times series 1972-2000 has been constructed as follows.
1. We start with constructing a base series. For the years 1988-2000 we directly use the published LFS figures.\(^1\)
2. In 1987 an important trend break occurs in LFS. As for Finland, the break is due to a redefinition of the professional status of employees in 1987, involving the inclusion of OMIBs in the self-employment count. We refer again to OECD (1992), p.185: ‘Data on the numbers of owner-managers of incorporated businesses are not widely available. In addition, their propensity to report themselves as self-employed is unknown. However, some evidence is available from the United States (where the Bureau of Labour Statistics began to identify them separately and class them as employees in 1967), from Sweden and Finland (who moved in the other direction in 1987), from Canada and from Germany’.

So, the LFS-reported figure for 1986 is exclusive of OMIBs, and the 1987 figure is inclusive of OMIBs (that is, those OMIBs that report themselves as self-employed). So, we have to construct an adjusted figure for 1986. We construct a raise factor to estimate the number of OMIBs in 1987, based on OECD (1992), p. 186: ‘In Sweden, […] the ending of attempts to account for the legal status raised the measured numbers of self-employed by around 45 per cent’. We approach as follows.

a. The 45% change that is mentioned in the quotation refers to the whole economy, \textit{i.e.}, including the agricultural sector. As the reported number in LFS 1978-1998 for employers and own-account workers in 1987 is 378 (whole economy), we infer that the number of OMIBs is 378-378/1.45=117.

b. Next, we have to distribute the 117 OMIBs for the whole economy from step a., over the agricultural and non-agricultural activities. From LFS 1978-1998, we note that the number of employers and own-account workers in the agricultural sector declined with 4 for each year in the period 1982-1985 and 1987-1989 (1986 is not comparable due to another trend break, see step 3). Assuming for simplicity that the change 1986-1987 was also 4, the expected figure for 1987 is 96 (the published figure in 1986) - 4 = 92. The actual published figure in 1987 is (also) 96 though. We therefore assume that the inclusion of OMIBs in 1987 raised the number of employers and own-account workers in the agricultural sector by 4.

c. Having established then that there are 4 OMIBs in the agricultural sector in 1987, the number of OMIBs outside agriculture equals 117-4=113 (we obtained the number of 117 in step a). Now, we can compare the number of 113

\(^1\)This description concerns the series that was constructed for the previous version of our data set, COMPENDIA 2000.1. At the time, LFS 1978-1998 was the most recent version available. In LFS 1981-2001, employment figures for the years 1987-1992 have been revised. As these revisions are very small, we have taken over the COMPENDIA 2000.1 figures, and the corrections described in steps 2 to 5 remain valid.
OMIBs with the total reported number of employers and own-account workers outside the agricultural sector of 282. This provides us with a raise factor for the number of OMIBs of \((1+113/(282-113))=1.67\).

3 In 1986 there is a second trend break, involving the age span of the counted (working) population: ‘Data previous to 1986 represent all persons aged 16 to 74 years; since 1986, they represent all persons aged 16 to 64 years.’ (OECD 1999, p. 249). As this trend break also applies to total labour force, we do not correct for this particular trend break. This implies a slight inconsistency in the times series of absolute number of business owners and total labour force. The series of relative number of business owners (business ownership rate) remains consistent though.

4 For 1972-1986 we multiply the LFS reported numbers by 1.67 (see step 2c). We now have a base series for the whole period 1972-1998.

5 From Table 1 we see that for Sweden, the OMIB categorization is ‘including most OMIBs’. Therefore, we apply the procedure described in Chapter 3. We see that the LFS figure is higher than the number of enterprises. Therefore, in COMPENDIA, we use the base series obtained in step 4 for the number of business owners in Sweden.

5.15 United Kingdom

For the United Kingdom, the business ownership times series 1972-2000 has been constructed as follows.

1 We start with constructing a base series. For the years 1992-2000 we directly use the published figures in LFS 1981-2001.

2 In 1992 a trend break occurs. This involves the inclusion of unpaid family workers in the business ownership count prior to 1992. We correct the LFS numbers using the fraction of business owners in the aggregate of business owners and unpaid family workers. Obtaining this fraction is not as straightforward as for most other countries where this type of trend break occurs. For the UK, the Country Table ‘Civilian Employment’ in LFS 1978-1998 has as third category ‘not specified’ instead of ‘unpaid family workers’. In the country notes of the UK (OECD 1999, p. 273), the numbers of ‘persons in government schemes’ are reported for 1984-1997. These workers are always included in the ‘not specified’ category. On the remaining workers in the ‘not specified’ category, OECD (1999, p. 273) says: ‘The difference between the total of the ‘not specified’ category and ‘persons in government schemes’ corresponds to the persons with ‘status not stated’ from 1984 to 1991 and to unpaid family workers from 1992 to 1997’. Based on this remark, we are able to compute the 1992 fraction of business owners in the aggregate of business owners and unpaid family workers as \(2885/(2885+(566-385))\).

3 In LFS 1978-1998, reported figures prior to 1992 under ‘employers and persons working on own account’ include unpaid family workers. For the years 1984-1990 we multiply the LFS figures by the fraction obtained in step 2. We now have a base series for the period 1984-1998.

4 In 1984, a second trend break occurs. We compute the 1982 figure by using the average of the relative changes 1982-1983 and 1984-1985 for relative change 1983-1984, and relative change 1982-1983 directly from LFS.

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1 From step 2 onwards, the description concerns the series that was constructed for the previous version of our data set, COMPENDIA 2000.1. At the time, LFS 1978-1998 was the most recent version available. In LFS 1981-2001, employment figures prior to 1994 have not been changed so that the corrections described in steps 2 to 6 remain valid.
For 1972-1980, relative changes 1972-1982 are used, obtained directly from LFS. We now have a base series for the whole period 1972-1998.

From table 1 we see that for the UK, the OMIB categorization in *OECD Employment Outlook June 2000* is ‘including most OMIBs’. Therefore, we apply the procedure described in chapter 3, to establish the absolute level of business ownership in the UK. This results in a raise factor of 1.04 (see table 1). We multiply the number of business owners from the base series by 1.04, for the whole period 1972-1998, to arrive at our final business ownership times series for the United Kingdom.

### 5.16 Iceland

For Iceland, the business ownership times series 1972-2000 has been constructed as follows.

1. We start with constructing a base series. For the years 1992-2000 we directly use the published LFS figures.
2. In 1991 a trend break occurs. Prior to 1991, numbers of workers are expressed in man years instead of persons. We apply average annual change 1992-1996 to the 1992 number to get an estimate for 1990. For the period 1972-1990 we use relative annual changes in the number of business owners (in man years), as published in LFS. We also make some additional corrections as there seem to be some more trend breaks. Although not indicated as trend breaks in LFS, in 1986 and 1988 the numbers of self-employed change dramatically. The reported numbers in LFS imply an increase in the number of business owners of more than 30% between 1984 and 1986, and an increase of more than 25% between 1986 and 1988. As we think such high changes are not realistic, we make corrections based on changes in surrounding years. This results in a base series for the whole period 1972-2000 (in persons).
3. From table 1 we see that for Iceland, the OMIB categorization is ‘unclear’. Instead of applying the usual procedure to establish the absolute level of business ownership, we make use of ‘expert knowledge’. This involves the fact that in Iceland, relatively many persons are self-employed as second job. This is clear from data tables reported on the website of Statistics Iceland ([www.statice.is](http://www.statice.is)). From *Labour Market Statistics 2000*, table 2.2.1: Employed persons by status in employment 1991-2000, and table 2.5.5: Persons with more than one job by status in second employment 1995-2000, we see that for Iceland, the number of self-employed as second job as a fraction of the number of self-employed as main occupation in 2000 equals 8900/27500=0.32 (whole economy), which is very high. So, many enterprises are apparently owned by persons who are self-employed as second job. Therefore, the number of enterprises is not appropriate here as approximation of the number of business owners (main occupation). We use the LFS-based series obtained in step 2 instead.

### 5.17 Norway

For Norway, the business ownership times series 1972-2000 has been constructed as follows.

1. We directly use the published LFS figures, for the whole period 1972-2000.
2. From table 1 we see that for Norway, the OMIB categorization is ‘excluding most OMIBs’. Therefore, we apply the procedure described in chapter 3. This results in a raise factor of 1.45 (see table 1). We multiply the number of business owners from
the base series by 1.45, for the whole period 1972-2000, to arrive at our final business ownership times series for Norway.

5.18 Switzerland

For Switzerland, the business ownership times series 1972-2000 has been constructed as follows.

1 For Switzerland, not much information on self-employment is given in OECD Labour Force Statistics. From 1991 onwards, the number of employers and own-account workers is published, but only for the whole economy (i.e., no separate numbers for agriculture and non-agriculture). For years prior to 1991, no information on employers and own-account workers is given at all. Therefore, we base our series on data provided by Observa St. Gallen-Geneva (c/o Schweizerisches Institut für gewerbliche Wirtschaft, Universität St. Gallen). This institute provided us with data on the number of employers and own-account workers for the years 1970, 1980, 1990, and 1991-1995 (whole economy).

2 Data for the years 1972-1978 and 1982-1988 are obtained by means of interpolation. The figures for 1991-1995 correspond to the figures reported in LFS, version 1976-1996. Therefore, we use the 1996 figure from LFS 1976-1996. The figures are inclusive of OMIBs. In LFS 1981-2001 different numbers of employers and own-account workers are given for 1991-1996, compared to LFS 1976-1996. This involves a redistribution of the numbers under the items wage earners and salaried employees on the one hand, and employers and own-account workers on the other hand, in favour of the wage earners. As the numbers of total employment and unpaid family workers remain almost the same as in LFS 1976-1996, perhaps the redistribution involves classification of OMIBs as wage earners instead of self-employed. For 1998 and 2000 we use relative annual changes from LFS 1981-2001. We now have a series 1972-2000 on the number of business owners in Switzerland, including OMIBs, for the whole economy.

3 Next, we have to distribute the number of business owners for the whole economy from step 2., over the agricultural and non-agricultural activities. As LFS does not give any indication of the distribution of business owners over industries for Switzerland, we make the following rough approximation. We use the 1988 average of the share of non-agricultural business owners in total business owners (whole economy) of three surrounding countries: France, Italy, and West-Germany (LFS 1976-1996). Sector structure in Switzerland may be similar to sector structures of these surrounding countries as the Swiss economy is partly dependent on these countries. The share is calculated as 0.76.1

4 We multiply our series obtained in step 2. by 0.76 to arrive at our final times series for Switzerland. Note that the OMIB categorization in OECD Employment Outlook June 2000 is not available (see table 1). However, we know from Observa St. Gallen-Geneva that the data on self-employed are inclusive of OMIBs.

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1 Austria is excluded from this calculation as the share of non-agricultural business owners of Austria in 1988 deviates from the other three countries: 0.56. We consider this low share not representative for Switzerland. We acknowledge that our estimation method for Switzerland is to a certain extent arbitrary.
5.19 Japan
For Japan, the business ownership times series 1972-2000 has been constructed as follows.
1. We start with constructing a base series. For the years 1972-2000 we directly use the published LFS figures.
2. From table 1 we see that the LFS figures exclude all OMIBs. We estimate the number of OMIBs making use of enterprise statistics. In particular, we make use of data from Japan Statistical Yearbook 2002, a publication by the Statistics Bureau of the Ministry of Public Management, Home Affairs, Posts and Telecommunications. From Japan Statistical Yearbook 2002 we use data from table 5-9: ‘Incorporated enterprises by form of organization, industry of enterprise, size of capital and regular employees (1969–96)’. In this table the total number of incorporated enterprises in Japan is reported, by size class and legal form, for the period 1969-1996 (selected years). Three categories of legal forms are distinguished: joint-stock companies; limited companies; limited or unlimited partnerships and mutual insurance company. The distribution over legal forms is given only for 1996, while total number of incorporated enterprises is given for the whole period 1969-1996. We compute the number of limited companies smaller than 50 employees as a fraction of total incorporated enterprises in 1996 and apply this fraction for the whole period 1969-1996. We use limited companies because this comes closest to the concept of owner/manager of incorporated business (OMIB). The number of incorporated enterprises in agriculture in Japan is negligibly small. For missing years in the period 1969-1996 we interpolate. For 1998 and 2000 we use interpolated values for relative change based on relative change 1996-2001 in the number of limited companies. This results in an estimated series for the number of incorporated self-employed for the period 1972-2000. The implicit raise factor (total self-employed/unincorporated self-employed) ranges from 1.07 in 1972 to 1.15 in 2000.
3. We add the LFS series (unincorporated self-employed) to the series for incorporated self-employed obtained in step 2, to arrive at a series 1972-2000 for total self-employed in Japan.

5.20 Canada
For Canada, the business ownership times series 1972-2000 has been constructed as follows.
1. In OECD Labour Force Statistics 1981-2001 the reported numbers of employers and own-account workers concern only the unincorporated self-employed, not the incorporated. However, in OECD Employment Outlook June 2000, p. 158, table 5.1, non-agricultural self-employment including OMIBs, is reported for Canada, for the period 1979-1997 (selected years). In principle, we use this series. By comparing the number of self-employed including OMIBs from OECD (2000) and the number

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1 The number for 2001 is taken from http://www.stat.go.jp/english/data/jigyou/2001/zuhyou/a007.xls. These data are consistent with the 1996 data from the mentioned table 5-9.
2 This can be deduced from additional information at http://strategis.ic.gc.ca/ssg/rd00686e.html#. This involves a table with the number of self-employed workers in Canada by category and industry, for 1996 and 2001 (source: Labour Force Survey, Statistics Canada). There are four categories along the dimensions incorporated/unincorporated and with paid help/without paid help, and a separate category unpaid family workers. The numbers for employers and persons working on own account in OECD LFS 1981-2001 correspond to the numbers for unincorporated self-employed (with and without paid help).
of self-employed excluding OMIBs from LFS (version 1978-1998), we construct a raise factor series for OMIBs for the years 1979-1994. For missing years in the OECD (2000) self-employment series, we multiply the LFS figure by the interpolated raise factor. This results in a series 1980-1996.


3 The self-employment figures 1972-1978 are obtained as follows. We start by constructing a series based on OECD LFS (i.e., excluding OMIBs) which is comparable over time. This is done in three steps. First, for 1976 we use the LFS 1976-1996 figure as this is consistent with the 1978 figure from LFS 1978-1998 (the 1976 figure from LFS 1970-1990 is not). Second, the 1972 and 1974 figures from LFS 1970-1990 are corrected for the different 1976 levels in the LFS versions 1970-1990 and 1976-1996 (this results in a correction factor 554/543). Third, the 1972 and 1974 figures are corrected for the inclusion of unpaid family workers in the LFS self-employment count prior to 1975. We eliminate the unpaid family workers using the fraction ‘employers and persons working on own account’ / (‘employers and persons working on own account’ + ‘unpaid family workers’) in 1975. This fraction equals 509/(509+39). Next, having established a time-consistent series for 1972-1978 (which, in turn, is consistent with the 1979-1994 series in LFS 1978-1998), we multiply these LFS-based figures for 1972-1978 by the 1979 raise factor for OMIBs (see step 1). The raise factor equals 1007/672=1.50. We now have a consistent self-employment series, including OMIBs, for the whole period 1972-2000.

5.21 Australia

For Australia, the business ownership times series 1972-2000 has been constructed as follows.

1 We start with constructing a base series. For the years 1972-2000 we directly use the published LFS figures.

2 From table 1 we see that the LFS figures exclude all OMIBs. We obtain a correction factor using data from the website of the Australian Bureau of Statistics (http://www.abs.gov.au). From the home page, when we follow the path ‘Statistics’; ‘Main Features’; ‘63. Earnings, hours and employment conditions’; ‘6359.0 Forms of Employment, Australia’, we arrive at a site where a distribution of all employed persons in Australia over various employment categories is reported (main job). Owner managers of incorporated and unincorporated enterprises are explicitly identified and in November 2001 their numbers are 627800 and 1129400, respectively. From this, one can derive a raise factor for OMIBs as (1129400+627800)/1129400=1.56. For August 1998, the corresponding value for

¹ In OECD LFS 1978-1998 the reported numbers of employers and own-account workers for the years 1996-1998 include OMIBs. This is in contrast with LFS versions 1976-1996 and 1981-2001, where OMIBs are excluded.

² See footnote 2 at page 38. We excluded agriculture, forestry, fishing, mining, oil and gas in computing this growth rate 1996-2001.
this raise factor is 1.52. We apply the 1998 raise factor for the whole period 1972-2000. There might be a slight bias in the value of the raise factor as it refers to the whole economy (i.e., including agriculture).

5.22 New Zealand

For New Zealand, the business ownership times series 1972-2000 has been constructed as follows.

1 We start with constructing a base series. For the years 1986-2000 we directly use the published figures from LFS 1981-2001.

2 In 1986 a trend break occurs. In fact, prior to 1986, data on employers and persons working on own account are provided for the years 1979-1981 only (there are also no data for 1972-1978 in LFS 1970-1990), and these numbers are not consistent with the 1986 number. We apply a number of corrections to obtain a series of two-yearly changes for the period 1972-1986. Because the 1972-1984 part of our self-employment series is based on a limited amount of direct information on numbers of self-employed, the 1972-1984 part has to be considered a rough estimate. The general direction of our corrections is described below.

3 For relative change in the number of self-employed 1984-1986 we use the average of relative change 1986-88 and 1988-90 (from LFS 1970-1990). This results in our number of self-employed for 1984. Next, we compute an artificial value for 1984, interpolating the reported LFS numbers of self-employed in 1980 and 1986 (which are not consistent). This provides us with a correction factor for the 1979-1981 LFS numbers. We also compute relative changes 1971-76 and 1976-81 in the ‘derived’ number of self-employed. Based on the correction factor, these relative changes 1971-76-81, and on interpolation, we construct a rough estimate for the relative change series 1972-1984. Next, we apply the series to our 1984 number of self-employed to obtain a series for the whole period 1972-2000.

4 From table 1 we see that the OMIB categorization is ‘unclear’. However, by combining information from OECD (1999) and the website of Statistics New Zealand, we conclude that the self-employment numbers in LFS 1978-1998 (which differ marginally from LFS 1981-2001) probably include OMIBs. This is explained below. We know that in OECD Labour Force Statistics ‘Estimates are based on the quarterly employment survey’ (OECD 1999, p. 97). Furthermore, on the website of Statistics New Zealand, we read: ‘From a labour statistics point of view owner managers are generally classified with the self-employed or employers. The Quarterly Employment Survey follows this approach’ (website Statistics New Zealand: Statistical Standard for Status in Employment 1999, see http://www.stats.govt.nz). Combining these two observations it seems likely that OMIBs are included, and we consider the series obtained in step 3 our final business ownership series for New Zealand.

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1 The 1998 raise factor was used in the previous version of our data set, COMPENDIA 2000.1. We also use it in the COMPENDIA 2000.2 version.

2 We subtract the number of wage earners according to Country table IV (‘Wage earners and salaried employees by activities’) of LFS 1970-1990 from the total number of workers according to the Civilian Employment table (Country table III). However, the data of table IV for New Zealand are given for 1971, 1976 and 1981 only, and they are not fully consistent with table III.

3 From the home page, follow the path ‘Classifications and standards’; ‘View statistical standards’; ‘Status in Employment’; ‘Definition’.
6 Total labour force

In COMPENDIA, the variable total labour force is used as scaling variable for the number of business owners. Hence, the business ownership rate of a country is defined as the number of business owners divided by total labour force. Data on total labour force are also obtained from OECD Labour Force Statistics. In principle, we use data from Part I: General Tables. Total labour force consists of employees, self-employed persons (including OMIBs), unpaid family workers, people employed by the Army and unemployed persons. For ten countries trend breaks had to be removed and these are described below. Countries that are not mentioned use the published data from LFS, without adjustment.¹

Austria
For Austria, figures on total labour force for 1972 and 1974 are taken from Part II: Country Tables, Table II: Total labour force (LFS 1970-1990). This is done because 1972 and 1974 figures from Part I: General Tables (LFS 1970-1990) are not comparable to total labour force 1976 from LFS 1978-1998. (The title LFS 1978-1998 suggests that there are data from 1978 onwards. However, this applies only to Part II: Country Tables. For Part I: General Tables, data are reported from 1975 onwards.)

France
For France, LFS figures on total labour force for 1972 and 1974 are raised by 19 (000). This is because total labour force data from LFS 1978-1998 and LFS 1970-1990 are not entirely consistent. In particular, 1975 data are marginally different (22372 in LFS 1978-1998; 22353 in LFS 1970-1990). We make a simple correction by adding the difference between the two versions (i.e., 19) to the reported figures for 1972 and 1974 in LFS 1970-1990.

Greece
For Greece, prior to 1978, consistent data on total labour force are given for 1971 and 1977 only, not for the years in between. We interpolate for the years 1972-1976.

Italy
For Italy, there is a trend break in 1993. We compute total labour force in 1992 using the average of growth 1991-1992 and growth 1993-1994 for growth 1992-1993. This results in a decrease of the LFS-reported figure for 1992 of 4.9% (i.e., for 1992, total labour force in COMPENDIA divided by total labour force in LFS 1978-1998 equals 0.951). To keep the time series consistent we also multiply all LFS numbers prior to 1992 by 0.951. Note that we also applied this correction for the number of business owners, so that the business ownership rate is also consistent over time (see section 5.9).

¹ The labour force data in COMPENDIA 2000.2 are made consistent with the 2000 level in LFS 1981-2001, p. 13 (Part I: General Tables). However, for three countries there is a slight difference for the size of the labour force in 2000, as the series in LFS 1981-2001 changed in comparison with LFS 1978-1998. These countries are Italy, Sweden and Canada.
The Netherlands
In 1987 the former ‘Arbeidskrachtentelling’ was replaced by the ‘Enquête Beroepsbevolking’. This results in a trend break in 1987 in LFS, involving ‘the implementation of a continuous survey’ (OECD, 2002, p. 324). We use average annual growth rates 1985-86 and 1988-90 in total labour force to obtain a figure for 1986. Next, we use annual growth 1984-86 according to LFS. There are also trend breaks in 1975, 1981 and 1983. For 1972-1984 we use annual growth rates in total labour force, according to the labour force series published by Statistics Netherlands on Statline (see http://statline.cbs.nl, item ‘Tijdreeks Beroepsbevolking’). This involves a revised (i.e., time-consistent) series for the period 1970-2000. However, this series is not the same as the series published in OECD Labour Force Statistics, as the labour force series on Statline only counts persons working (or willing to work) for at least twelve hours per week. In OECD Labour Force Statistics all persons working for at least one hour per week are counted. Hence, the figures on Statline are lower.

Iceland
For Iceland, there is a trend break in 1991. Prior to 1991, the size of the labour force is expressed in man years instead of persons. We multiply the pre-1991 numbers from LFS with a raise factor. This factor is computed as total employment in 1992 in persons according to LFS (whole economy) divided by total employment in 1992 in man years (taken from OECD National Accounts 1983-1995) and equals 1.11.

Switzerland

Canada
For Canada, LFS figures on total labour force for 1972 and 1974 are raised by 327 (000). This is because total labour force data from LFS 1978-1998 and LFS 1970-1990 are not entirely consistent. In particular, 1976 data are marginally different (10604 in LFS 1978-1998; 10277 in LFS 1970-1990). We make a simple correction by adding the difference between the two versions (i.e., 327) to the reported figures for 1972 and 1974 in LFS 1970-1990.

Australia
For Australia, figures on total labour force for 1972 and 1974 are taken from Part II: Country Tables, Table II: Total labour force (LFS 1970-1990). This is done because 1972 and 1974 figures from Part I: General Tables are not comparable to total labour force 1976 from LFS 1978-1998.

New Zealand
For New Zealand, there is a trend break in 1996 in LFS 1978-1998. We proceed by multiplying the LFS (version 1978-1998) series 1986-1994 by a correction factor. This factor is computed as total labour force 1996 according to LFS 1978-1998 divided by total labour force 1996 according to LFS 1976-1996 and equals 1850/1797. Furthermore,
7 Discussion

In this report we presented the data set COMPENDIA 2000.2. The data set contains harmonized information on numbers of business owners and the size of the labour force, for 23 OECD countries over the period 1972-2000. The quotient of these two variables is called the business ownership rate. These harmonized data are needed for modern economic research into the causes and consequences of entrepreneurship in a broad economic sense (i.e., business ownership).

Our primary data source is *OECD Labour Force Statistics* and in COMPENDIA 2000.2 we have made an attempt to make business ownership rates comparable across countries and over time. The main problem in harmonizing business ownership data is the different statistical treatment of the incorporated self-employed, as this category of workers is classified as wage-and-salary workers in some countries, and as self-employed workers in other countries. We have chosen our business ownership definition to include the unincorporated and the incorporated self-employed, because both categories run their own businesses. Concerning self-employment definitions being in force in different countries, we based ourselves on the definitions reported in *OECD Employment Outlook June 2000*. Next, for countries not including all owner/managers of incorporated businesses in their self-employment count, we made corrections based on numbers of enterprises from *The European Observatory for SMEs: Sixth Report*, or, for some countries, specific information from national sources.

In making these corrections, we tried to approximate the (unknown) real numbers of business owners as closely as possible. Of course, the quality of the approximations depends on the plausibility of the corrections applied. In this respect, we should mention some limitations of our data set. First, for many countries, we apply a constant correction factor for OMIBs (computed in 1994) to the whole period 1972-2000. This is not ideal as, in reality, the number of OMIBs in proportion to the number of unincorporated self-employed may change over time. In many cases this drawback is however mitigated because our correction only relates to a smaller number of non-identified OMIBs. Second, for many countries, our correction factor for numbers of OMIBs is based on enterprise data, not on employment (i.e., person-based) data. It is well-known that there are many difficulties in relating these two kinds of data sources. Third, for some countries little information on numbers of non-agricultural self-employed was available in OECD Labour Force Statistics, forcing us to use rather crude approximation methods. This holds especially for Switzerland and, prior to 1986, for New Zealand.

Despite these limitations we think that COMPENDIA 2000.2 provides the most reliable, comparative data set available today, regarding business ownership across industrialized countries and over time.

For harmonizing business ownership data across countries and over time, the ideal situation would be to use actual data on numbers of incorporated self-employed (as for some countries is already done in COMPENDIA 2000.2), but for many countries these numbers cannot be identified from the domestic labour force surveys being in force. For these countries, corrections based on numbers of enterprises are the best approximation possible. Nevertheless, in order to improve cross-country comparability of business ownership data, future research should concentrate on collecting actual data on numbers of incorporated self-employed. If not available from labour force surveys, such data may be obtained from other national sources like tax return data.
References


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Annex I Data

In this annex we present the data from COMPENDIA 2000.2. On the next three pages the number of business owners, the size of the labour force and the business ownership rate are displayed for 23 OECD countries over the period 1972-2000.
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Business owners include unincorporated and incorporated self-employed, and exclude unpaid family workers.

Business owners in agriculture, hunting, forestry and fishing are excluded.

Until 1990, Germany refers to West-Germany.
### Total labour force (thousands of persons)

| Year | Austria | Belgium | Denmark | Finland | France | Germany | Greece | Ireland | Italy | Luxembourg | The Netherlands | Portugal | Spain | Sweden | United Kingdom | Iceland | Norway | Switzerland | United States | Japan | Canada | Australia | New Zealand |
|------|---------|---------|---------|---------|--------|---------|--------|---------|-------|-----------|--------------|----------|-------|--------|---------------|--------|--------|------------|             |       |         |           |            |
| 1972 | 3028    | 3804    | 2424    | 2204    | 21771  | 27121  | 3257   | 1121   | 19690 | 149      | 5833       | 3594    | 13094 | 3970   | 25288         | 98     | 1701   | 3579       | 88847        | 52000 | 9308   | 5836       | 1303       |
| 1974 | 3051    | 3902    | 2479    | 2299    | 22289  | 27411  | 3281   | 1143   | 20006 | 156      | 5880       | 3972    | 13506 | 4043   | 25676         | 104    | 1709   | 3613       | 93670        | 53100 | 10047  | 6063       | 1401       |
| 1976 | 3001    | 3962    | 2495    | 2404    | 22654  | 27034  | 306   | 1169   | 20488 | 158      | 5951       | 4121    | 13510 | 4155   | 26111         | 110    | 1844   | 3360       | 97826        | 53780 | 10604  | 6260       | 1456       |
| 1978 | 3079    | 4008    | 2578    | 2404    | 23148  | 27212  | 3336   | 1209   | 20868 | 158      | 6010       | 4177    | 13655 | 4209   | 26357         | 113    | 1911   | 3396       | 103882       | 55320 | 11340  | 6474       | 1488       |
| 1980 | 3128    | 4070    | 2685    | 2473    | 23504  | 27948  | 3451   | 1247   | 21439 | 159      | 6167       | 4361    | 13755 | 4318   | 26840         | 118    | 1940   | 3501       | 108544       | 56500 | 12056  | 6748       | 1516       |
| 1982 | 3302    | 4120    | 2700    | 2473    | 23905  | 28558  | 3451   | 1296   | 21672 | 160      | 6376       | 4330    | 13967 | 4318   | 27265         | 131    | 1995   | 3609       | 111872       | 59740 | 12473  | 6913       | 1559       |
| 1984 | 3363    | 4132    | 2720    | 2542    | 24123  | 28558  | 3717   | 1307   | 22171 | 161      | 6478       | 4529    | 14224 | 4357   | 27791         | 131    | 2034   | 3668       | 115241       | 60200 | 12928  | 7141       | 1595       |
| 1986 | 3388    | 4127    | 2816    | 2575    | 24322  | 28558  | 3868   | 1308   | 22673 | 167      | 6478       | 4520    | 14424 | 4391   | 28255         | 139    | 2128   | 3779       | 119540       | 61660 | 13455  | 7585       | 1667       |
| 1988 | 3433    | 4179    | 2881    | 2596    | 24550  | 28558  | 3888   | 1310   | 23045 | 177      | 6641       | 4520    | 15355 | 4385   | 28581         | 143    | 2183   | 3866       | 123378       | 63840 | 13978  | 7962       | 1655       |
| 1990 | 3526    | 4237    | 2912    | 2576    | 24838  | 28558  | 3961   | 1305   | 23304 | 192      | 6872       | 4520    | 15888 | 4471   | 28855         | 143    | 2142   | 3952       | 127476       | 65780 | 14408  | 8461       | 1664       |
| 1992 | 3679    | 4291    | 2914    | 2527    | 25087  | 28558  | 4000   | 1305   | 23696 | 203      | 7133       | 4520    | 16245 | 4540   | 29581         | 143    | 2130   | 3952       | 129541       | 66450 | 14558  | 4429       | 1712       |
| 1994 | 3876    | 4329    | 2777    | 2521    | 25316  | 28558  | 4034   | 1305   | 23936 | 213      | 7184       | 4520    | 16646 | 4429   | 29855         | 143    | 2239   | 3952       | 132474       | 67110 | 14905  | 4428       | 1790       |
| 1996 | 3870    | 4359    | 2822    | 2532    | 25625  | 28558  | 4189   | 1305   | 23382 | 226      | 7517       | 4498    | 17100 | 4429   | 30555         | 143    | 2233   | 3952       | 135231       | 67930 | 15209  | 4310       | 1850       |
| 1998 | 3888    | 4410    | 2848    | 2609    | 26015  | 28558  | 4481   | 1305   | 23549 | 242      | 7797       | 4667    | 17939 | 4429   | 31664         | 143    | 2233   | 3952       | 138902       | 67660 | 15692  | 4255       | 1874       |
| 2000 | 3918    |         | 2853    |         | 26574  |         |        |        |       |           |             |         |        |        |               |        |        |            |             |       |         |            |          |

Until 1990, Germany refers to West-Germany.
### Business ownership rate (number of business owners/total labour force)

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Business owners include unincorporated and incorporated self-employed, and exclude unpaid family workers.

Business owners in agriculture, hunting, forestry and fishing are excluded.

Until 1990, Germany refers to West-Germany.
Annex II Upper and lower bounds for the United States

There is considerable controversy about the number of self-employed or business owners in the United States. The reported numbers of self-employed in *OECD Labour Force Statistics* for the US are taken from the Current Population Survey (CPS), which is carried out by the Bureau of Labor Statistics (BLS). The self-employment definition used here only includes unincorporated self-employed and excludes owner/managers of incorporated businesses (OMIBs). Since in COMPENDIA, OMIBs are included in the self-employment definition, an estimation of the number of OMIBs (or incorporated self-employed) must be made.

As described in chapter 4, in COMPENDIA we base our estimation of the number of OMIBs on the number of employer firms. Although we think our method is plausible, we acknowledge that different estimates can be obtained if other data sources or approximation methods are used. In the current annex we present two alternative series for US self-employment. Compared to COMPENDIA, one series has higher numbers of business owners, and the other one lower numbers. The two alternative series can be interpreted as upper and lower bounds for the (unknown) ‘true’ number of business owners in the United States.

**COMPENDIA: Number of OMIBs approximated by number of employer firms**

In COMPENDIA the estimation of the number of OMIBs is based on the number of employer firms (firms with employees), as published in the various versions of *The State of Small Business, A Report of the President* (United States Small Business Administration, Office of Advocacy), see for example Tables A2 and A5 of the 1998 version at http://www.sba.gov/advo/stats/stateofsb1998.pdf. Using this method we basically follow another publication of the Office of Advocacy, *Small Business Economic Indicators 1998*, where it is stated that ‘Incorporated self-employment is generally defined as an employer firm’ (p. 5). See http://www.sba.gov/advo/stats/sbei98.pdf. We only include firms with less than 50 employees because in larger companies the manager often does not have the control. Also, not all firms are independent. The method has some disadvantages. On the one hand, the number of employer firms may overlap with the number of (unincorporated) self-employed as self-employed individuals may also have employees. This may lead to overestimating the total number of business owners. On the other hand, employer firms may have more than one OMIB, which may lead to underestimating the total number of business owners. All in all, we consider estimating the number of OMIBs by the number of employer firms a fairly plausible method.

**Alternative methods and data sources**

Although we have constructed our time series in chapter 4 as our ‘best guess’ for US self-employment, we acknowledge that different numbers of business owners can be obtained if we use other data sources or approximation methods. Below, we shall discuss both a method that leads to a relatively high number of business owners and a method that leads to a relatively low number. These series can be interpreted as upper and lower bounds for the ‘true’ level of business ownership in the United States. In this terminology the series used in COMPENDIA can be considered a good point estimate.
Upper bound series: Characteristics of Business Owners (firm-based survey)

In COMPENDIA, the estimated number of total self-employed is based partly on surveys held with persons (unincorporated self-employed) and partly on surveys held with firms (incorporated self-employed). However, higher numbers of business owners can be obtained if we base our estimation entirely on surveys held with firms. For example, the number of U.S. business owners as reported in the Bureau of the Census publication *Characteristics of Business Owners 1992* (CBO), is much higher. Here, a survey is sent out to firms and each firm is asked whether or not there are owners who actively work in the firm. Using CBO, we get higher numbers of business owners than the numbers in COMPENDIA. We illustrate this with an example for 1992.

In COMPENDIA the number of non-agricultural U.S. business owners in 1992 (roughly) equals $8.6 + 4.8 = 13.4$ million. The separate components of this number are the number of unincorporated self-employed taken from *OECD Labour Force Statistics*, and the number of incorporated self-employed, approximated by the number of employer firms with less than 50 employees (derived from *The State of Small Business, A Report of the President*), respectively.

However, taking the number of owners as published by *Characteristics of Business Owners 1992* (see [http://www.sba.gov/advo/stats/ch_em97.pdf](http://www.sba.gov/advo/stats/ch_em97.pdf), table 5.2) as a starting point, we arrive at 14.5 million business owners, as will be shown below. According to this publication, there are some 18.6 million owners of firms outside the agricultural sector, of whom 8.4% are not active in the firm themselves. This leaves 17.1 million active business owners. Furthermore, according to the Bureau of the Census, approximately 2.6 million people run a business as secondary occupation, next to wage-and-salary employment. Because we include only those people who run a business as main occupation in our self-employment count, we arrive at 14.5 million business owners. So, using this method we have 1.1 million persons more than the figure used in COMPENDIA. Part of this difference can be explained by the fact that ‘many self-employed individuals have more than one business’ (*Small Business Economic Indicators 1999*, p. 7), see [http://www.sba.gov/advo/stats/sbei99.pdf](http://www.sba.gov/advo/stats/sbei99.pdf). However, the difference seems too big to ascribe solely to this phenomenon, leaving an amount of indistinctness about the ‘true’ level of U.S. business ownership.

Although we cannot entirely explain why we arrive at such a high figure using this method, constructing such a series is useful, because it provides an upper bound for the real number of business owners in the United States. This upper bound series is reported in Verhoeven et al. (2001). See table A1.

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Lower bound series: Current Population Survey (person-based survey)

We can obtain yet different numbers of business owners if we use the number of OMIBs according to the Current Population Survey. This is a survey held with persons. Although in the CPS, incorporated self-employed individuals are classified as wage and salary worker, many of them are identified by the CPS, and their numbers can be obtained from the Bureau of Labor Statistics. An advantage of using this data source is that both the number of incorporated self-employed and the number of unincorporated
self-employed are taken from the same labour force survey (CPS), as in this method the unincorporated self-employed are again taken from OECD Labour Force Statistics. A disadvantage is that not all incorporated self-employed individuals are identified by this labour force survey, resulting in an underestimation of their numbers. This will be explained below. In the CPS, employed respondents are asked whether they are employed by government, by a private company, or a non-profit organization (in which cases they are classified as wage and salary workers) or whether they are self-employed. In the latter case, the following extra question is asked: ‘Is this business incorporated?’ Those who respond in the affirmative are thus identified as incorporated self-employed individuals and, although for the purposes of the official CPS self-employment count they are reclassified as wage and salary worker, their numbers can be obtained from BLS. But not all incorporated self-employed are detected by the extra question. Owner/managers of incorporated businesses who answer that they are wage and salary workers (because legally, this is correct, as they get a salary from their own business) are not identified as self-employed workers because no extra question is asked to people who respond that they are employed by a private company. So the numbers of incorporated self-employed as identified by the CPS only relate to people who respond ‘erroneously’ (for the purposes of the CPS) that they are self-employed. The figures do not include those OMIBs who ‘correctly’ identify themselves as wage and salary workers. These OMIBs cannot be identified. See the article of Bregger (1996), which can be downloaded via http://stats.bls.gov/opub/mlr/1996/01/art1full.pdf.

So, measuring the total number of self-employed in this way results in underestimating the ‘true’ level of U.S. business ownership. Indeed, for 1992, we now get a number of 12.2 million business owners, which is over a million less than COMPENDIA, and even over two million less than the number based on CBO. However, constructing such a series is useful, because it provides a lower bound for the real number of business owners in the United States. This lower bound series is also reported in Verhoeven et al. (2001). See table A2.

Table A2  U.S. total number of business owners 1972-1998, based on CPS (x 1000)

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