

# Scottish Water's non-household water customer numbers

Prepared for  
Water Industry Commission for Scotland

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## Executive summary

The Water Industry Commission for Scotland (WICS) asked Oxera to assist it in identifying the number of non-household water customers that should currently be billed by Scottish Water.

During the 2004 Strategic Review of Charges, Scottish Water submitted to WICS the following figures for its non-household water customer numbers:

2003/04	140,000
202004/05	133,000
2005/06	121,000

Scottish Water stated that this was the result of a 'data cleansing' exercise. This compares with figures previously reported by the three former Water Authorities of around 180,000 non-household water customers in Scotland.

Various data sources collated in this study provide estimates of the number of businesses in Scotland. However, for several reasons these estimates could be *both* higher or lower than Scottish Water's number of billed non-household water customers. As a result, it is not possible to adjust them to provide a direct estimate for Scottish Water's number of billed non-households.

Rather, the approach taken in this study to estimate benchmarks for Scottish Water's non-household water customer numbers is as follows:

- from an external data source, identify the number of businesses in England & Wales and in Scotland;
- from water company data, identify the number of non-household water customers in England & Wales and in Scotland;
- estimate the ratio between the number of businesses (from the external source) and the number of non-household water customers in England & Wales and in Scotland;
- check whether this ratio for Scotland (for 2003/04, 202004/05 and 2005/06) is similar to that for England and Wales. If so, this would suggest that Scottish Water's figure for non-household water customers is reasonable;
- use the calculated ratio for England & Wales and apply this to the external data on the number of businesses in Scotland in order to provide a benchmark for the number of non-household water customers in Scotland (ie, this number represents the expected number of non-household water customers in Scotland if Scotland had the same ratio of businesses to the number of non-household water customers as England and Wales).

This approach is followed on the basis of several different data sources in order to provide a cross-check, some sensitivity and a range of possible values for Scottish Water's non-household water customer numbers. The sources used were:

- the Inter Departmental Business Register (IDBR), which is a registry of UK businesses maintained by National Statistics (NS) and uses VAT trader information for its core data;
- Regional Trends, which is based on the IDBR, and uses the number of UK sites of businesses registered for VAT and/or PAYE;

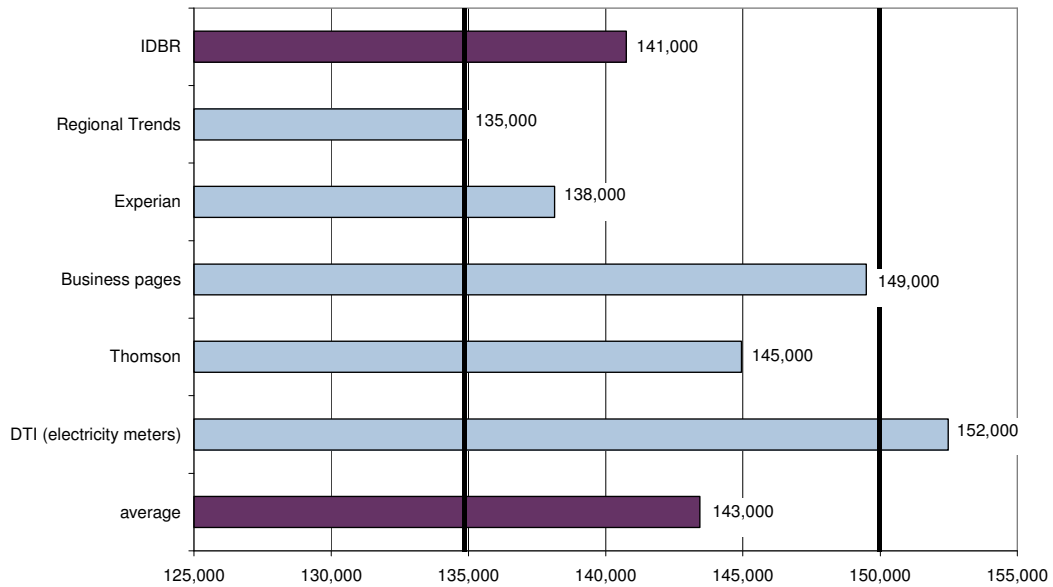
- Experian, which uses Companies House, Thomson Directories and public record data from the Registry of County Court Judgments and the Electoral Roll;
- Yell's Business Pages and Thomson Directories; and
- DTI data on electricity meters.

In addition, other sources, such as Companies House data, were rejected due to the omission of certain Scottish companies.

Each data source provides a possible benchmark for Scottish Water's non-household water customer numbers, but with a degree of uncertainty, which needs to be borne in mind.

The results of these calculations are summarised below. The benchmark based on the IDBR data of 141,000 is considered the most robust (and, hence, is highlighted and placed first in the figure). Similarly, the average across all benchmarks (also highlighted) will average out some of the upward and downward biases of each individual benchmark, and therefore provides a central, more reliable, estimate. The other benchmarks are roughly ranked in order of reliability each in turn below the IDBR-based benchmark. (For example, the DTI electricity meters data is considered to be less reliable than the other sources).

**Summary of benchmarks for Scottish Water's non-household water customers based on comparisons with England and Wales water companies**



Source: Oxera.

Thus, Oxera considers that the number of billed non-household water customers is likely to be around **135,000 to 150,000** in Scotland.

# Contents

<b>1</b>	<b>Introduction</b>	<b>1</b>
1.1	Objective of study	1
1.2	Background	1
1.3	Structure of report	2
<b>2</b>	<b>Definitional issues and methodology</b>	<b>3</b>
2.1	Definitional issues	3
2.2	Potential biases in estimating non-household customers	4
2.3	Methodology	5
<b>3</b>	<b>The benchmarks</b>	<b>8</b>
3.1	Estimates of non-household customers using the IDBR	8
3.2	Estimates of non-household customers using Regional Trends	9
3.3	Estimates of non-household customers using commercial sources	10
3.4	Estimates of non-household customers using electricity metering point data	12
3.5	Estimates of non-household customers using data sources based on IDBR, UK Annual Business Inquiry and Companies House data	13
<b>4</b>	<b>Conclusions</b>	<b>14</b>
	<b>Appendix 1 Data from National Statistics: IDBR</b>	<b>16</b>
A1.1	The type of business units covered by the IDBR	16
A1.2	The type of public bodies covered in the IDBR–VAT registry	18
	<b>Appendix 2 Data on businesses from commercial data sources</b>	<b>19</b>
	<b>Appendix 3 DTI electricity metering point data</b>	<b>20</b>
	<b>Appendix 4 Data sources from the Scottish Executive</b>	<b>22</b>
	<b>Appendix 5 Companies House and FAME</b>	<b>24</b>

## List of tables

Table 3.1	Summary of IDBR estimate of the number of Scottish businesses	8
Table 3.2	Scottish non-household estimate based on IDBR figures	9
Table 3.3	Summary of Regional Trends estimate of the number of Scottish businesses	9
Table 3.4	Scottish non-household estimate based on Regional Trends	10
Table 3.5	Summary of estimates of the number of Scottish businesses based on commercial sources	10
Table 3.6	Scottish non-household estimate based on Experian	11
Table 3.7	Scottish non-household estimate based on Thomson	11

Table 3.8	Scottish non-household estimate based on Yellow Pages Business pages	11
Table 3.9	Summary of DTI data on electricity metering points in Scotland	12
Table 3.10	Scottish non-household estimate based on DTI electricity meter point administration numbers	12
Table 4.1	Summary of benchmarks for Scottish Water's non-household customers	15
Table A1.1	IDBR data: number of local units in VAT-based enterprises in all industries in Scotland	17
Table A2.1	Electricity: I&C MPANs ('000s)	21
Table A4.1	Total number of enterprises in Scotland according to Scottish Economic Statistics	22
Table A4.2	Total number of business units in Scotland according to Annual Business Statistics	23
Table A5.1	Number of Scottish companies registered in Companies House	24

## List of figures

Figure 2.1	Enterprises versus local units	4
Figure 2.2	Representation of methodology to estimate the number of non-households in Scotland	6
Figure A1.1	Links between units	17

# 1 Introduction

## 1.1 Objective of study

The Water Industry Commission for Scotland (WICS) has asked Oxera to estimate the current number of Scottish Water non-household water customers.

## 1.2 Background

During the 2004 Strategic Review of Charges,<sup>1</sup> Scottish Water submitted to WICS a figure of 139,693 for its non-household customer numbers (from its 2003/04 Annual Return). Subsequently, Scottish Water resubmitted its business plan tables, which provided a forecast figure of 133,491 for 202004/05, and 121,319 for 2005/06. Scottish Water stated that this reduction was the result of a 'data cleansing' exercise. This compares with figures previously reported by the three former Water Authorities of around 180,000 non-household customers in Scotland.

In the Strategic Review of Charges, in response to these submissions:

The Commissioner expressed his concern that there could be a large number of customers who were either not being billed or were not being billed for the correct amount. He suggested that identifying these customers should be a priority for Scottish Water. It seemed to him to be unlikely that all billing errors should result in extra revenue being accrued by Scottish Water.

The Commissioner expressed particular concern in relation to the revised number of non-household customers, which appeared to be rather low.

Notwithstanding his concerns about the quality of the information provided by Scottish Water, the Commissioner accepted Scottish Water's projected lower customer numbers and revenue for 2005-06. This was likely to favour Scottish Water.

In its determination, WICS also presented a table showing that Scottish Water has one of the lowest ratios, at 6.3%, between non-households and households in relation to the companies in England and Wales. Such a ratio is, however, dependent on the urban/rural mix of the company in question. As WICS states:

The Commissioner concluded that he would have expected there to be a higher proportion of businesses to properties in more rural areas than in more urban areas.

Scottish Water seemed to have relatively few non-household properties connected per household. Most companies with a similar proportion of non-household customers are located in the South East of England. If Scottish Water had the British average proportion of businesses to households, then it would have around 160,000 non-household customers. The Commissioner concluded that this number of business customers would seem to be consistent with the information available about the number of businesses in Scotland.

The approach used in this study is not dependent on identifying comparator water companies (ie, companies with similar regional characteristics) as it is based on comparing ratios of

<sup>1</sup> WICS (2005), 'Strategic Review of Charges 2006–2010'.

proxy measures for the number of non-households to the number of billed non-households between Scotland and England & Wales (see section 2.3.3). The approach is therefore dependent on the consistency of these measures in Scotland versus England & Wales as a whole.

### **1.3 Structure of report**

This report estimates several benchmarks using a number of sources to provide a range for the expected level of Scottish Water's non-household customer numbers.

The report is structured as follows:

- section 2 discusses some of the issues and describes Oxera's methodology;
- section 3 summarises the benchmark evidence from the key sources;
- section 4 concludes;
- Appendix 1–5 examine in more detail, respectively:
  - the Inter Departmental Business Register (IDBR);
  - data from commercial sources;
  - data on electricity metering points;
  - data from the Scottish Executive;
  - data from Companies House and FAME.



## 2 Definitional issues and methodology

### 2.1 Definitional issues

Before identifying possible benchmarks for Scottish Water's non-household customer numbers, it is important to understand the type of water customers that this report is seeking to identify and how this differs from other definitions of businesses.

#### 2.1.1 Billed non-households

The following is taken from Ofwat's June Return reporting requirements and definitions manual, Section 2, Chapter 7.<sup>2</sup>

**Households** are properties used as single domestic dwellings (normally occupied), receiving water for domestic purposes, which are not factories, offices or commercial premises. These include cases where a single aggregate bill is issued to cover separate dwellings having individual standing charges. (In some instances the standing charge may be zero.) The number of dwellings attracting an individual standing charge should be counted, not the number of bills. Mixed/commercial properties and multiple household properties (eg, blocks of flats having only one standing charge) should be excluded.

Examples include:

- typical family dwellings (ie, terraced, semi-detached, detached house or flat having individual standing charges); or
- local authority family dwellings which each have individual standing charges but may be included in an aggregate water bill.

**Non-households** are properties receiving water for domestic purposes but which are not occupied as domestic premises, or where domestic dwellings are combined with other properties, or where properties are in multiple occupation but only have one standing charge. The number of bills should be counted in this case.

Examples include:

- industrial/commercial properties;
- combined premises with a single standing charge, such as a flat above a shop; or
- a block of flats or a caravan site which consist of multiple dwellings but only have one standing charge.

The third category would imply that the number of business units (used as the main proxy in this report) will underestimate the number of non-households billed.

In Scotland, a household is defined as a property on the Council Tax register that is billed for water services, either through the local authority (non-metered water) or through having a meter and Scottish Water billing it directly. A non-household is defined as all other subjects connected to the water network. The implication of this slight difference in definition is discussed in section 2.3.2.

<sup>2</sup> Ofwat (2005), 'June Return reporting requirements and definitions manual: Section 2 Chapter 7: Water Properties and Population'.

## 2.1.2 Enterprises and local units

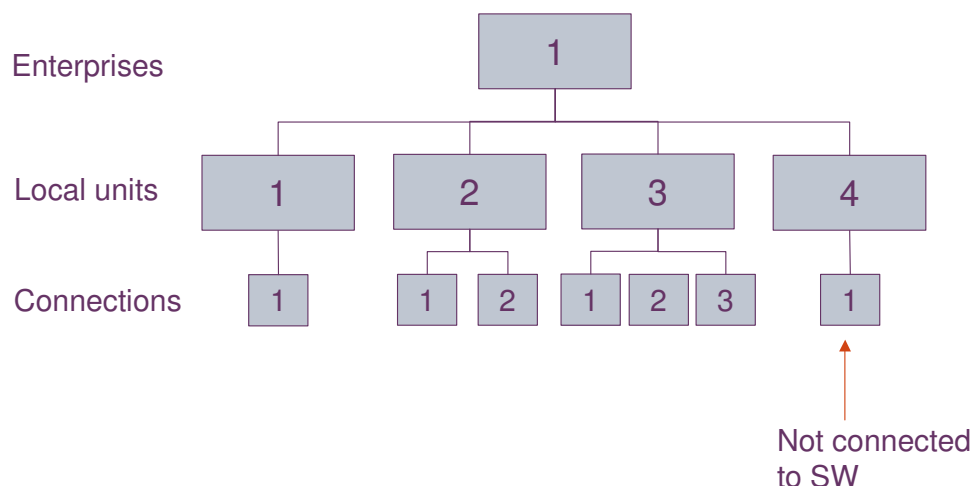
The following units of observation are relevant when defining the number of non-households.

- *Enterprise group*—a group of legal units under common ownership is called an enterprise group. An enterprise is the smallest combination of legal units, which has a certain degree of autonomy within an enterprise group.
- *Local unit*—an individual site (factory, shop, etc) in an enterprise is called a local unit. Each of these is potentially a customer connected to Scottish Water.
- *Connections*—several connections may exist at each local unit; similarly, some local units may not be connected to Scottish Water’s network.

Figure 2.1 illustrates the relationship between enterprises, local units and connections.

The data sources used in section 3 provide information at both the enterprise level and the local unit level.

**Figure 2.1 Enterprises versus local units**



Source: Oxera.

As such, there is no one-for-one relationship between Scottish Water’s billed non-household customers and any of the above units. It is assumed in this report that billed customers is best proxied by local units, although the method used in this study (see section 2.3) addresses this issue by assuming that the ratio (at whichever level of aggregation) in Scotland is similar to that in England and Wales.

## 2.2 Potential biases in estimating non-household customers

In addition to the aggregation issue discussed above, it is considered in this section whether external sources can be used as a direct estimate of Scottish Water’s non-household customer numbers (following an upward or downward adjustment to account for any possible inclusions or exclusions of certain types of non-household customer).

### 2.2.1 Sources of overestimation of non-household customer numbers

General sources of overestimation of non-household customer numbers include the following businesses.

- *Businesses that do not occupy a property connected to Scottish Water’s network or would be considered a household.* For example, anyone running a business based

around a vehicle or a self-employed business without any employees is likely to be using their house as their business base.

- *Businesses not connected to Scottish Water*—this may apply to rural businesses, most of which are farms.<sup>3</sup> However, the majority of these are actually connected to the water supply network.
- *Businesses that have closed down*—this is accounted for explicitly in some of the statistics. For example, Companies House data provides information on active and inactive companies, while IDBR data excludes companies with no turnover or without employees.

### 2.2.2 Sources of underestimation of non-household customer numbers

General sources of underestimation of non-household customer numbers include the following.

- *Charities and non-for profit bodies*—these can be excluded from certain data sources. However, the IDBR numbers (section 3.1) include some or all of these bodies.<sup>4</sup>
- *Statistics may not cover the whole of Scotland*—while this may apply to some statistics (eg, Companies House information, see section 3.5), it does not apply to the IDBR numbers.

*Consequently, there will never be an exact one-to-one match between the number of businesses and the number of billed non-households.*

## 2.3 Methodology

The discussion in section 2.2 has led to the focus on one main data source that minimises the above issues—the IDBR. Although the IDBR is considered the most reliable database for estimating Scottish Water’s non-household customer numbers, several other data sources are also used to estimate the company’s non-household customer numbers in order to provide more confidence in the resultant benchmark.

Despite the preference for the IDBR as the main source, this source still includes an element of under- and over-estimation of billed non-households.

### 2.3.1 Overall approach

Given the potential upward and downward biases in the proxy measures, it is not possible to adjust a proxy measure to provide a single *direct* estimation of non-household water customer numbers in Scotland.

Rather, the approach used in this report is to focus on the most reliable and robust sources and compare these proxies, measured as a *ratio* to the number of billed non-household customers, for Scotland and for England & Wales. Thus, the ratio of a given proxy non-household measure in Scotland to the number of billed non-household customers in Scotland would be expected to be similar to the ratio in England & Wales. For example, if there was an exact one-to-one match between the proxy measure and the number of non-household water

<sup>3</sup> There were 51,094 farms in Scotland in June 2005. Scottish Executive (2006), ‘Economic Report on Scottish Agriculture 2006’, Table C33. (In comparison, the IDBR, examined in section 3.1, includes 18,595 businesses in the agriculture industry.)

<sup>4</sup> To provide an example of bodies that may be omitted from data sources other than the IDBR, information on health units shows that there are 109 general hospitals in Scotland plus 226 long-stay hospitals, giving a total of 335. Therefore, underestimates due to the exclusion of hospitals are likely to be immaterial. Scottish Health Statistics (2005), ‘Scottish Health Service Costs 2005’, Tables R020 & R020LS.

customers then this ratio would be one, but, more importantly for the methodology used in this study, it should be one for both Scotland and for England & Wales. The robustness of this assumption is considered by examining several data sources in order to provide alternative benchmarks using the same methodology.

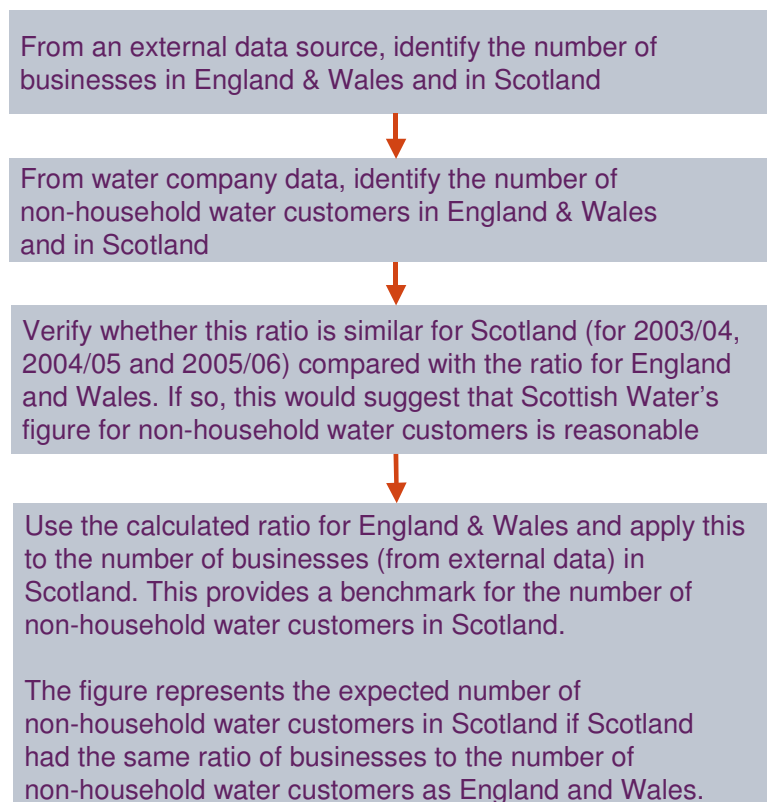
Such a comparison could be extended by comparing the ratio for Scottish Water to the ratio for individual WASCs. However, this would involve some judgement in terms of allocating Government Office Regions (GORs) to WASCs in order to derive the proxy measure for the WASCs, which would introduce additional uncertainty. For example, there is not a one-for-one relationship between Wales and Dwr Cymru (Severn Trent and Dee Valley serve some of Wales, while Dwr Cymru also serves some of England).

Moreover, it is not necessary to undertake the comparison for WASCs deemed to have similar characteristics to Scottish Water as the ratios are between two measures of non-households. These are only affected if the non-household measure is inconsistent between Scotland and England & Wales.<sup>5</sup>

### 2.3.2 Detailed description of methodology

The methodological approach used in this report is described in Figure 2.2.

**Figure 2.2 Representation of methodology to estimate the number of non-households in Scotland**



Source: Oxera.

<sup>5</sup> A comparison between Scottish Water and WASCs with similar characteristics to Scottish Water would be required if the comparison were, say, between the ratio of household to non-household numbers where structural differences (eg, in the degree of industrialisation) between England & Wales and Scotland would affect the ratios. In such instances, a comparison between Scotland and a WASC with a similar level of industrialisation would be required.

Given the discussion in section 2.2, the focus in this study is on the more robust and consistent data source—the IDBR—and, within this, the figures based on VAT-registered companies. In addition, this study uses a comparison with England & Wales to gauge the relationship between this figure and the number of non-households billed for water services.

This approach is then followed using other sources in order to provide a cross-check, some sensitivity and a range of possible values for Scottish Water’s non-household customer numbers.

As well as the need to consider the consistency and robustness of the proxy non-household measures, it is important to look at the consistency of the non-household water customer number itself (ie, the denominator in the calculated ratios). In this regard, two factors need to be taken into account:

- the level of non-connections—Scottish Water data<sup>6</sup> shows that, at the end of March 2006, around 97% of *households* were connected to Scottish Water’s network. Using June Return data,<sup>7</sup> it also appears that around 97% of *households* were connected to the network in England & Wales. Thus, the proportion of non-connections appears comparable across regions;
- the slight difference in definition in non-household customers—as discussed in section 2.1.1, this implies that the denominator in the ratio comparisons undertaken in this study will be (marginally) larger for England & Wales than for Scotland. Thus, the comparisons may somewhat underestimate the number of non-household water customers in Scotland.

<sup>6</sup> Scottish Water local authority household data submission to WICS.

<sup>7</sup> Specifically, ‘Household properties (water supply area)’, line 15 Table 7, and ‘Households billed water’, line 14 Table 7.

### 3 The benchmarks

Based on the available evidence, Oxera considers that the number of billed non-household customers is likely to be around 135,000–150,000 in Scotland.

In order to estimate this range, Oxera has considered the following sources of information:

- IDBR;
- Regional Trends;
- commercial sources (Thomson Directories, Yellow Pages Business Pages, Experian);
- DTI data on electricity meters;
- Scottish Executive publications; and
- Companies House information.

Each source was verified to establish whether information is collected consistently across the regions of the UK. For sources where there is consistency, the approach described in section 2 was used to estimate the number of non-household water customers in Scotland.

#### 3.1 Estimates of non-household customers using the IDBR

The IDBR is probably the most definitive data source on business in Great Britain, providing consistent data across England, Wales and Scotland, and thus the most robust source of information for estimating Scottish Water’s non-household customer numbers. The core IDBR data is the one containing only VAT-registered businesses, and the number for this is 116,520 *enterprises* for 2005. When translated into local units—ie, the figure relevant to the estimation—this becomes 163,825 in 2005. (See Appendix 1 for more details on the IDBR.)

Table 3.1 summarises the key features of the IDBR.

**Table 3.1 Summary of IDBR estimate of the number of Scottish businesses**

<b>Number of enterprises in Scotland</b>	<b>Year to which the data refers</b>	<b>What the data refers to</b>	<b>Reliability</b>	<b>Comments</b>
116,520	2005	Enterprises	Appears to be the most reliable data source on the number of businesses in Great Britain	The IDBR holds information at different levels of aggregation and covers nearly 99% of economic activity
163,825	2005	Local units	See above	See above

Source: NS–IDBR (2005), ‘UK Business Activity, Size and Location’.

Table 3.2 below compares the ratio of IDBR-based number of local units with that for non-households. (The figures in bold represent those deemed most robust for use as a benchmark for Scottish Water.) On this basis, Scottish Water’s figure of 139,693 as submitted in 2003/04 seems reasonable as its ratio of IDBR-based local units to billed non-

households of 1.17 is very similar to that for England and Wales. However, on the same basis, figures of 121,319, as submitted by Scottish Water for 2005/06, would seem too low.<sup>8</sup>

**Table 3.2 Scottish non-household estimate based on IDBR figures**

Regions	IDBR-based number of local units (1)	Water company data on billed non-households (2)	Ratio (3) = (1) ÷ (2)	Implied Scottish Water figure = (A) ÷ (3)
England and Wales	1,839,430	1,580,300	1.16	<b>140,746</b>
Scotland (2003/04)	163,825 = (A)	139,693	1.17	
Scotland (2004/05)		133,491	1.23	
Scotland (2005/06)		121,319	1.35	

Source: NS-IDBR (2005), 'UK Business Activity, Size and Location'; WICS; and Oxera calculations.

The table also demonstrates that the previous figure of around 180,000 submitted by the three Scottish Water Authorities in 2001 would appear to be too high.

The IDBR is probably the most complete and robust data source of the sources used in this study—the estimate of 140,766 therefore represents the central estimate of the number of Scottish Water's non-household customers.

## 3.2 Estimates of non-household customers using Regional Trends

Another source for estimating non-household customers numbers is Regional Trends. A regular source of official statistics for the Statistical Regions of the UK, Regional Trends can thus be considered robust and consistent across regions. It includes data, based on the IDBR, on the number of UK sites of businesses registered for VAT and/or PAYE, which are allocated to counties or regions on a local unit basis (eg, an individual factory or shop).<sup>9</sup> This information is summarised in Table 3.3.

**Table 3.3 Summary of Regional Trends estimate of the number of Scottish businesses**

Number of enterprises in Scotland	Year to which the data refers	What the data refers to	Reliability	Comments
196,100	2004	Premises of registered businesses	Reliable. Two-year time lag to ensure consistency with the United Kingdom National Accounts publication means that the IDBR data used has been fully confirmed	Likely to overestimate the number of businesses as it includes all individual sites operated by an enterprise, regardless of whether they are also a household address

Source: Oxera based on ONS (2006), 'Regional Trends 39'.

<sup>8</sup> Comparisons are undertaken for figures from slightly different years for the two key numbers (ie, IDBR figures relate to 2005 and water company non-household numbers relate to 2003/04, 2004/05 or 2005/06). It is thus assumed that the number of enterprises in England & Wales and Scotland has remained stable over this relatively short period or increased at similar rates. In fact, the number of Scottish businesses has remained broadly stable over this period and hence this assumption would appear to be reasonable.

<sup>9</sup> There is some lag time, with the 2006 edition providing March 2004 information.

The analysis undertaken in Table 3.2 is repeated in Table 3.4 for the estimated number of business sites presented in Table 3.3. The estimate based on Regional Trends suggests a figure of 134,814 non-household customers in Scotland.

**Table 3.4 Scottish non-household estimate based on Regional Trends**

Regions	Regional Trends-based number of business sites (1)	Water company data on billed non-households (2)	Ratio (3) = (1) ÷ (2)	Implied Scottish Water figure = (A) ÷ (3)
England and Wales	2,298,700	1,580,300	1.45	<b>134,814</b>
Scotland (2003/04)	196,100 = (A)	139,693	1.40	
Scotland (2004/05)		133,491	1.47	
Scotland (2005/06)		121,319	1.62	

Source: ONS (2006), 'Regional Trends 39', WICS; and Oxera calculations.

### 3.3 Estimates of non-household customers using commercial sources

This section explores two types of data source:

- sources that use Companies House data (see Appendix 5), supplemented with commercial data sources in order to improve coverage;
- commercial sources only.

Of the former, Experian provides perhaps the most reliable and complete data, reporting that the number of enterprises for Scotland in 2006 is 160,250. Data is updated monthly and uses reliable sources such as Companies House and public data obtained from the Registry of County Court Judgments and the Electoral Roll. It is also complemented by the Thomson Directories data.

The two main commercial data sources are Yell and Thomson. (For more details on all these data sources, see Appendix 2).

Table 3.5 summarises the estimates of commercial sources for the number of Scottish enterprises.

**Table 3.5 Summary of estimates of the number of Scottish businesses based on commercial sources**

Number of enterprises in Scotland	Year to which the data refers	What the data refers to	Reliability	Comments
<b>147,846</b>	2006	All business registered in Thomson Directories	Appears fairly reliable	It is free for businesses to be included and it is in their interests to register. Likely to include businesses trading from home
<b>148,000</b>	2006	All business registered in Yellow Pages	Appears fairly reliable	As above
<b>164,388</b>	2006	Registered filings Companies House Plus electoral registry records among others	Appears highly reliable	Uses Companies House, Thomson Directories and public record data from the Registry of County Court Judgments and the Electoral Roll. Updated monthly

Source: Oxera based on Thomson (2006), 'Thomson Directories Business Strata', September; Yell (2006), 'The business pages guide', February; Experian (2006), 'Prospect Locator: National Business database', September.



The analysis undertaken in Table 3.2 is repeated in Tables 3.6 to 3.8 below for the various non-household estimates presented in Table 3.5.<sup>10</sup> The estimates based on commercial data sources are 138,141, 144,947 and 149,494 non-household customers.

**Table 3.6 Scottish non-household estimate based on Experian**

Regions	Experian-based number of enterprises (1)	Water company data on billed non-households (2)	Ratio (3) = (1) ÷ (2)	Implied Scottish Water figure = (A) ÷ (3)
England and Wales	1,892,887	1,580,300	1.19	<b>138,141</b>
Scotland (2003/04)	164,388=(A)	139,693	1.15	
Scotland (2004/05)		133,491	1.20	
Scotland (2005/06)		121,319	1.32	

Note: The number of Scottish enterprises based on Experian data is as at 2006.  
Source: Experian (2006), 'Prospect Locator: National Business database', September; WICS; and Oxera calculations.

**Table 3.7 Scottish non-household estimate based on Thomson**

Regions	Thomson-based number of enterprises (1)	Water company data on billed non-households (2)	Ratio (3) = (1) ÷ (2)	Implied Scottish Water figure = (A) ÷ (3)
England and Wales	1,616,218	1,580,300	1.02	<b>144,947</b>
Scotland (2003/04)	147,846=(A)	139,693	1.15	
Scotland (2004/05)		133,491	1.20	
Scotland (2005/06)		121,319	1.32	

Note: The number of Scottish enterprises based on Thomson data is as at 2006.  
Source: Thomson (2006), 'Thomson Directories Business Strata', September; WICS, and Oxera calculations.

**Table 3.8 Scottish non-household estimate based on Yellow Pages Business pages**

Regions	Business pages-based number of enterprises (1)	Water company data on billed non-households (2)	Ratio (3) = (1) ÷ (2)	Implied Scottish Water figure = (A) ÷ (3)
England and Wales	1,567,000	1,580,300	0.99	<b>149,494</b>
Scotland (2003/04)	148,000=(A)	139,693	1.06	
Scotland (2004/05)		133,491	1.11	
Scotland (2005/06)		121,319	1.22	

Note: The number of Scottish enterprises based on Yellow Pages Business pages data is as at 2006.  
Source: Yell (2006), 'The business pages guide', February; WICS; and Oxera calculations.

<sup>10</sup> In all tables the estimates for the number of Scottish enterprises are taken from the most recently available year and are compared with the Scottish Water figure for each year. There are therefore some issues with comparing figures from different years. However, the number of Scottish businesses has remained broadly stable and the uncertainty/bias introduced as a result of this assumption is therefore unlikely to be material.

### 3.4 Estimates of non-household customers using electricity metering point data

Another source for estimating non-household customers numbers is the DTI's annual publication 'Energy Trends', which provides information on the number of electricity consumers at a regional and local level. Local authority and GOR-level data on electricity metering points was collected and aggregated for each sub-national area. Every metering point has a unique reference number, or meter point administration number (MPAN), which may have one or more meters.

While this information cannot be used directly to estimate non-household customers billed by Scottish Water, the same approach as that used in section 3.2 for the IDBR can be used, on the assumption that the number of MPANs to non-domestic water customers is similar in England & Wales to that in Scotland.

Table 3.9 summarises the results of the DTI's exercise for businesses and commercial customers.

**Table 3.9 Summary of DTI data on electricity metering points in Scotland**

Number of enterprises in Scotland	Year to which the data refers	What the data refers to	Reliability	Comments
218,000	2004	Electric: I&C MPANs	Moderate reliability: comprehensive but MPANs overestimate the number of non-households	Refers to electricity meter points and may overestimate the number for businesses that have several MPANs, or underestimate it—eg, where private networks are not included

Source: Oxera based on DTI (2006), 'Regional and Local Electricity and Gas Quality Indicators for 2004'.

The analysis undertaken in Table 3.2 is repeated in Table 3.10 for the estimated number of MPANs presented in Table 3.9. The estimate based on electricity metering points suggests a figure of 152,483 non-household customers in Scotland.

**Table 3.10 Scottish non-household estimate based on DTI electricity meter point administration numbers**

Regions	MPANs (1)	Water company data on billed non-households (2)	Ratio (3) = (1) ÷ (2)	Implied Scottish Water figure = (A) ÷ (3)
England and Wales	2,259,300	1,580,300	1.43	<b>152,483</b>
Scotland (2003/04)	218,000 = (A)	139,693	1.56	
Scotland (2004/05)		133,491	1.63	
Scotland (2005/06)		121,319	1.80	

Source: DTI (2006), 'Regional and Local Electricity and Gas Quality Indicators for 2004', April; and Oxera calculations.

Appendix 3 provides further methodological details and highlights the limitations of the electricity MPANs dataset collated by the DTI.

### 3.5 Estimates of non-household customers using data sources based on IDBR, UK Annual Business Inquiry and Companies House data

Of the additional data sources available that provide non-household customer estimates for Scotland, the most reliable are those produced by the Scottish Executive and based on the IDBR, the UK Annual Business Inquiry and those based on Companies House information.

The Scottish Executive uses the IDBR<sup>11</sup> and the UK Annual Business Inquiry<sup>12</sup> and undertakes additional analysis to improve the coverage of the datasets in Scotland. (For further details on these data sources, see Appendix 4). However, it is not possible to replicate the analysis of Table 3.2 as the data has been constructed for Scotland only and there is no equivalent for England and Wales.

A further data source that has been considered is the Companies House register. All limited companies in Great Britain are required by the Companies Act 1985 to file specific details.<sup>13</sup> This data is not used to replicate the analysis in Table 3.2 since in Scotland Companies House does not hold information on certain enterprises and thus the data is inconsistent between England & Wales and Scotland. (For further details see Appendix 5.)

<sup>11</sup> Scottish Executive (2006), 'Scottish Economic Statistics 2005'.

<sup>12</sup> Scottish Executive Statistics (2004), 'Scottish Annual Business Statistics 2003', Scotland Table 1998-2003: Scotland by Division.

<sup>13</sup> DTI (2006), 'Companies in 2004-2005', Table A.1.

## 4 Conclusions

Several alternative sources have been identified that provide information that could be used as a proxy for Scottish Water's non-household customer numbers, including:

- the IDBR, which is based on VAT and PAYE information;
- Regional Trends, which itself is based on the IDBR;
- commercial providers such as Thomson Directories and Yellow Pages, which collect their own data on the basis of the number of businesses that register with them;
- DTI data on electricity meters;
- Companies House, which records all company registrations in Great Britain;
- the Scottish Executive, which provides estimates for businesses in Scotland and is based on the IDBR.

In terms of reliability, of the above data sources:

- the IDBR is maintained by NS and is perhaps the most reliable;
- after the IDBR, Regional Trends, also maintained by NS, is potentially the next most reliable data source;
- of the commercial data sources, Experian is likely to be the most reliable data source;
- the Scottish Executive estimates of the number of Scottish enterprises were discarded since no comparable figures are available for England & Wales and hence appropriate benchmarks could not be constructed;
- the data based on Companies House similarly suffers from an inconsistency between Scotland and England & Wales, limiting any potential for cross-checking. As such, these figures were also discarded;
- the DTI data on electricity meters was considered to be the least reliable data source for this study.

Overall, the IDBR was used as the most robust and consistent proxy for comparison with data on England & Wales. This provides the basis of the central estimate of 140,746 of the number of non-households in Scotland. Taking into account all sources of information, based on the England & Wales water companies' non-household customer numbers and the number of VAT-registered enterprises, Oxera considers that the number of billed non-household customers is likely to be in the range of **135,000 to 150,000** in Scotland.

Table 4.1 below summarises the benchmarks derived from all the sources collated in this study.

**Table 4.1 Summary of benchmarks for Scottish Water's non-household customers**

<b>Source</b>	<b>Estimated benchmark for Scottish Water's non-household customers</b>
IDBR	140,746
Regional Trends	134,814
Thomson	144,947
Business pages	149,494
Experian	138,141
DTI (electricity meters)	152,483
<b>Range</b>	<b>134,814 to 152,483</b>
<b>Average</b>	<b>143,438</b>

Source: Oxera.

## Appendix 1 Data from National Statistics: IDBR

The IDBR is a list of UK businesses maintained by National Statistics (NS), which uses VAT trader information and PAYE employer information as its basis. The IDBR's annual publication is called 'UK Business: Activity, Size and Location'. The data presented by the IDBR is described as follows:

The IDBR is a registry of UK businesses maintained by National Statistics (NS) and combines the former Central Statistical Office (CSO) VAT based business register and the former Employment Department (ED) employment statistics system. It complies with European Union regulation 2186/93 on harmonisation of business registers for statistical purposes.

It covers all parts of the economy, but misses some very small businesses (self employed and those without employees and low turnover) and some non-profit making organizations. There are around 4.3 million businesses in the UK of which 2.1 million are on the IDBR. The IDBR provides nearly 99% coverage of economic activity.<sup>14</sup>

... Enterprises below the VAT registration threshold, are included only if they have chosen to register voluntarily or not to de-register. Businesses without a link to VAT (i.e. those with only PAYE reference) will be excluded from any analyses to avoid any possible duplication in the counts. They will be included in analyses in future publications, following completion of data checking.<sup>15</sup>

Only those inactive traders with turnover of zero and zero employment are excluded, accounting for approximately 14,300 VAT traders.

### A1.1 The type of business units covered by the IDBR

Similar to the discussion above on enterprises and business units, the IDBR holds information at different levels of aggregation. These include:

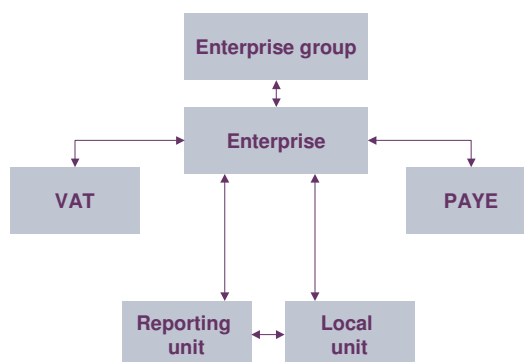
- **administrative units**—information on VAT traders and PAYE employers forms the basis of the IDBR;
- **statistical units**—a group of legal units under common ownership is called an enterprise group. An enterprise is the smallest combination of legal units (generally based on VAT or PAYE), which has a certain degree of autonomy within an enterprise group. An individual site (factory, shop, etc) in an enterprise is called a *local unit*;
- **reporting units**—these hold the mailing address to which the inquiry forms are sent. The form can cover the enterprise as a whole, or parts of the enterprise identified by lists of local units.

This is illustrated below (and links closely to Figure 2.1 in the main text).

<sup>14</sup> NS (2006), IDBR website, <http://www.statistics.gov.uk/idbr/idbr.asp> August.

<sup>15</sup> NS, 'IDBR Data Information', document received from IDBR.

**Figure A1.1 Links between units**



Source: Reproduced from National Statistics (2005), 'UK Business: Activity, Size and Location – 2005', October

Enterprises may have a number of individual sites, each potentially being a customer connected to Scottish Water. The smallest unit held on the register is an individual site (a *local unit*). One or more local units with their associated legal units (VAT or PAYE) form an *enterprise*, the smallest combination of these legal units. A group of enterprises under common ownership forms an *enterprise group*. The numbers of local units in Scotland presented on a sectoral basis as estimated by the IDBR are shown in Table A1.1. The total number of local units in VAT-based enterprises in Scotland in 2005 was 163,825—an increase of around 900 local units compared with 2004 (162,970).

**Table A1.1 IDBR data: number of local units in VAT-based enterprises in all industries in Scotland**

Sector	2003	2004	2005	2006
Agriculture	18,765	18,440	18,595	18,565
Production	10,830	10,480	10,420	10,305
Construction	13,255	13,385	13,915	14,415
Motor trades	5,310	5,290	5,240	5,240
Wholesale	7,525	7,600	7,680	7,650
Retail	24,230	23,905	23,770	23,495
Hotels & catering	13,980	14,035	14,020	13,755
Transport	5,860	5,755	5,760	5,670
Post & telecom	1,740	1,740	1,690	1,705
Finance	2,980	3,525	3,555	3,465
Property & business services	32,745	33,270	34,615	36,365
Education	5,560	5,475	5,310	5,135
Health	3,735	3,760	3,795	4,005
Public admin & other services	16,920	16,310	15,640	14,955
<b>Total</b>	<b>163,435</b>	<b>162,970</b>	<b>163,825<sup>1</sup></b>	<b>164,710</b>

Note: 'The confidentiality of all data held in IDBR is protected by the National Statistics Code of Practice and associated Protocols and by specific legislation ... All counts have been rounded to the nearest five to avoid disclosure. This means that total may not necessarily equal the sum of the data in rows and columns and counts of less than 3 are shown as zero. In addition, percentages may not always sum to 100 due to rounding.' NS-IDBR (2005); 'UK Business: Activity, Size and Location; Introduction', para 14.

Source: NS (2005 and 2004), 'UK Business Activity, Size and Location', Table A1.1.

## A1.2 The type of public bodies covered in the IDBR–VAT registry

One issue with the IBDR dataset is that public sector bodies may not need to be VAT-registered and therefore may not be included in the dataset. Since these are also connected to the water supply, they may result in the number of connected properties being underestimated.

The principle of the Value Added Tax Act 1994 is that VAT should apply in the same way to the public sector as it does to commercial businesses. As for commercial businesses, public bodies are obliged to charge VAT on any taxable supplies made in the course or furtherance of a business. The difficulty is in determining what constitutes a business in the public sector. Many activities of public bodies are carried out under a statutory duty and are not therefore 'businesses' for VAT purposes—ie, they are outside the scope of the tax.

The VAT treatment of different parts of the public sector is further explored below.<sup>16</sup>

- **Government departments**—whereas private businesses must register for VAT only if their annual turnover is above a certain level, government departments, including devolved government bodies, are required to account for VAT regardless of the annual value of their supplies.<sup>17</sup>
- **Non-Departmental Public Bodies (NDPBs)**—these are not considered government departments for VAT purposes and must comply with the normal VAT regulations. If taxable business activities exceed the VAT registration limit, the NDPB must apply to its local Customs & Excise VAT office for registration.
- **The National Health Service**—NHS bodies do not charge for most of their services and hence the question of charging VAT does not usually arise. Supplies of health services are therefore exempt from VAT.
- **Local authorities**—VAT is applied to local authorities in a similar way to other public bodies. Every local authority that provides taxable services in the course or furtherance of its business is required to be registered unless the level of their taxable services results in less than £1,000 tax a year.

<sup>16</sup> Based on HM Revenue and Customs (2006), 'VAT Notice 700/2 "Group Treatment"'.  
<sup>17</sup> See HM Revenue and Customs, and NAO.



## Appendix 2 Data on businesses from commercial data sources

The following provides further information of the commercial sources of the number of non-households:

- **Yellow Pages Business Pages**—the number of businesses listed in this publication was 148,000 in 2006. Although there is no charge for a basic listing in the Yellow Pages Business Pages, there is also no requirement to be listed. As a business-to-business publication, some small businesses might not find a listing necessary, while others might avoid it to prevent their company receiving unwanted mail or phone calls. The quoted figure for 2006 is for minimum circulation.<sup>18</sup>
- **Thomson Directories Business Strata**—the number of businesses listed in this publication was 149,010 in 2006. This is also a business-to-business source and has the same potential data gaps as the Yellow Pages.<sup>19</sup>
- **National Business Database (Experian)**—the number of businesses listed in this publication was 160,250 in 2006. Oxera has calculated this figure by adding the individual numbers presented for Scotland excluding the Isles. Experian combines data from various sources, but the two main sources are Companies House and Thomson Directories. In addition, public record data obtained from The Registry of County Court Judgments and the Electoral Roll is used. The database is updated monthly.<sup>20</sup>

<sup>18</sup> Yell (2006), 'The business pages guide', February.

<sup>19</sup> Thomson (2006), 'Thomson Directories Business Strata', September.

<sup>20</sup> Experian (2006), 'Prospect Locator: National Business database', September.

## Appendix 3 DTI electricity metering point data

This appendix further discusses the data of electricity metering point administration numbers (MPANs) produced by the DTI.<sup>21</sup>

The first results of the exercise to create electricity consumption data at a regional and local level were published in the December 2004 edition of the DTI's 'Energy Trends'. These were subsequently updated for the March 2005 issue. This regional data is classified by the DTI as 'experimental' since the methodology for its production is still subject to modification. The DTI therefore stresses in its publications that the regional statistics may not meet 'the rigorous quality standards required of National Statistics'.<sup>22</sup>

The methodology used is described as follows:

To produce 2004 annualised data at both local authority (NUTS4) and government office regional (NUTS1) levels data were collected for all electricity metering points and then aggregated for each of the sub national areas. Every metering point has a unique reference number called an MPAN or meter point administration number—which may have one or more meters. Consumption data for all MPANs are held on the systems of the data aggregators (DAs), the agents of the electricity suppliers who collate/aggregate electricity consumption levels for each meter. To find the geographical location of each MPAN, DTI obtained the Gemserv CD-ROM (December 2004 version), which contains the full address and postcode of each MPAN. Gemserv is the company who were awarded the contract to provide one central access point for suppliers to obtain address and postcode information about each MPAN. Gemserv data are therefore taken from the electricity distributors' meter point administration system (MPAS). By merging the DAs' consumption data with Gemserv's postal address files, local and regional consumption estimates were compiled.<sup>23</sup>

Any nominally domestic MPANs with consumption over 100,000 kWh (i.e. profile codes 1 and 2) were allocated to the industrial and commercial sector in the same way as they had been for 2003. Inspection of the individual data showed that there were very few recognisable private addresses with consumptions over 100,000 kWh, but a significant number between 50,000 and 100,000 kWh per year. However, as a refinement to the methodology, where the third variable of the address started with UNMET (i.e. unmetered) or STR (street lighting) or LAND or LLO (Landlord supply) or STAIR (staircase lighting) or TEMP (temporary builders' supply) consumption was moved to the industrial and commercial category. The 100,000 kWh cut off is known to have classified some very large domestic users to the industrial and commercial sector but this is more than outweighed by the number of small industrial and commercial consumers that will have been allocated to the domestic sector.<sup>24</sup>

Table A2.1 presents the results of the DTI's exercise for businesses and commercial customers in Scotland, England and Wales for 2003 and 2004. According to the table there were 218,000 MPAN-based Scottish enterprises in 2004.

<sup>21</sup> DTI (2005), 'Energy Trends: December 2005', p. 23.

<sup>22</sup> Ibid.

<sup>23</sup> Ibid, p. 35.

<sup>24</sup> Ibid., p. 36.

**Table A2.1 Electricity: I&C MPANs ('000s)**

	<b>2003</b>	<b>2004</b>
Scotland	217	218
Wales	99	130
England	2,117	2,129
England and Wales	2,216	2,259
<b>Great Britain total</b>	<b>2,433</b>	<b>2,477</b>

Source: DTI (2006), 'Regional and Local Electricity and Gas Quality Indicators for 2004', April.

MPAN data may over- or underestimate the number of enterprises depending on the region to which the information refers.

The DTI provides the following reasons for why the number of electricity MPANs may exceed the number of businesses:

- non-household customers have more than one point at which electricity enters a site recorded on the IDBR;
- if there is swift turnover of businesses in a region, with a high number of rapidly changing enterprises, there are likely to be more MPANs than businesses. This may include commercial properties that have previously been in multiple occupation, and metered as such, and then subsequently let to a single business.

The DTI provides the following reasons for why there may be more businesses than electricity MPANs:

- the existence of private networks where the electricity consumption is not included in the DTI's figures. The responsibility of the meter may reside with the landlord instead of the tenants; this is especially likely to be the case if several enterprises are operating from a single address;
- there may be small businesses operating from domestic premises, profiled as 'domestic customers'.<sup>25</sup>

<sup>25</sup> DTI (2004), 'Guidance Note on Quality Indicators of the 2004 Local and Regional Gas and Electricity Consumption Data', April, p. 5.

## Appendix 4 Data sources from the Scottish Executive

This appendix provides some further details on the figures produced by the Scottish Executive quoted in section 3.5.

### A4.1 Scottish Economic Statistics

Table A4.1 summarises the total number of enterprises according to data from the Scottish Executive's Scottish Economic Statistics. The figures are based on the IDBR, the Labour Force Survey, the Family Resources Survey and the Survey of Personal Incomes. IDBR data is used to obtain an estimate of VAT-registered enterprises (the *total registered* row in Table A4.1). The number of unregistered enterprises is estimated by combining data from the IDBR with estimates derived from the Labour Force Survey, the Family Resources Survey and the Survey of Personal Incomes.

**Table A4.1 Total number of enterprises in Scotland according to Scottish Economic Statistics**

	2002	2003	2004
Total registered	149,505	147,695	149,210
Unregistered	94,070	115,055	121,220
<b>Total</b>	<b>243,575</b>	<b>262,750</b>	<b>270,430</b>

Source: Scottish Executive (2004, 2005, 2006), 'Scottish Economic Statistics', Table 2.A.

The Scottish Executive states that the data should be used with caution:

It should be borne in mind that the number of enterprises with no employees which are not registered on the IDBR is significant. These are estimated from a combination of sample surveys, which are all subject to sampling error. For example a yearly estimate of 6,000 taken from the LFS has a 95% confidence interval of +/-2,640.<sup>26</sup>

This raises doubts about the robustness of the calculations of the unregistered data since the numbers may be considerably biased. It is also not clear whether the unregistered figures include *all* the public and non-for-profit bodies, or only those that are VAT-registered. Given these uncertainties, the above estimate of the number of unregistered enterprises is not used in this study.

### A4.2 Scottish Annual Business Statistics

The UK Annual Business Inquiry conducted by the NS covers approximately two-thirds of the economy; the main sectors not covered are the financial sector and some of the public sector. However, the Scottish Executive publishes additional analyses for Scotland based on the Annual Business Inquiry estimates, to cover the whole of the Scottish economy. The number of business units in Scotland according to this estimation is shown in Table A4.2.

<sup>26</sup> Scottish Executive (2005), 'Scottish Economic Statistics 2005', p. 158.

**Table A4.2 Total number of business units in Scotland according to Annual Business Statistics**

<b>1998</b>	<b>1999</b>	<b>2000</b>	<b>2001</b>	<b>2002</b>	<b>2003</b>
136,860	139,573	143,682	145,950	145,535	145,841

Note: The latest figures relate to 2003 and were released in October 2005.

Source: Scottish Executive (2005), 'Scotland Table 1998-2003: Scotland by Division, Scottish Annual Business Statistics', October.

## Appendix 5 Companies House and FAME

### Companies House

All limited companies in Great Britain are registered with Companies House, part of the DTI, and are required by the Companies Act 1985 to file specific details. This data is published monthly in Companies House's own Business Register Statistics and annually in the DTI Report on Companies.<sup>27</sup>

Companies House data is at the enterprise level; moreover, it does not hold information on the following:

- unincorporated firms (sole traders and partnerships);
- Scottish Industrial/Provident companies;
- Scottish Royal Charter companies.

The exclusion of the second and third categories is particularly important as it will result in inconsistency between the Scottish figures and those for England and Wales because Companies House data underestimates the number of companies in Scotland. Table A5.1 shows the number of Scottish companies registered in Companies House.

**Table A5.1 Number of Scottish companies registered in Companies House**

Description	2005	2006
Active Register	108,021	114,975
Total Register	117,944	126,361

Note: Figures as at July 2005

Source: Business Register Statistics, Monthly Statistics.

### FAME

The FAME (Financial Analysis Made Easy) database provides financial profiles of companies registered with Companies House. The number of active companies in Companies House and FAME are similar. However, information comes from registered filings, and as such is not always completely up to date—for example, if the company has been late in filing or has

<sup>27</sup> DTI (2006), 'Companies in 2004-2005', Table A.1.

not registered that is has ceased trading. Companies are classified as active or inactive. As at September 2006, FAME listed 161,492 Scottish companies, of which only 117,524 were recorded as 'active'.<sup>28</sup>

<sup>28</sup> FAME (2006), [www.bvdep.com/fame.html](http://www.bvdep.com/fame.html)

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