



Department
for Business
Innovation & Skills

**BIS ESTIMATE OF THE
PROPORTION OF UK SMES IN THE
SUPPLY CHAIN OF EXPORTERS**

Methodology note

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UK SMEs in the supply chains of exporters

An SME, or a business more generally, can be involved in exporting by selling directly to a foreign consumer or firm, or through supply-chains. That is, an SME might sell its output to another UK-based business that itself exports.

Using available data, this paper seeks to estimate what proportion of SMEs are involved in such supply chains. For the purposes of this note, we use a broad definition of supply chains capturing all SMEs who supply exporters, or who are further down the chain supplying businesses who supply exporters. Supply chains play an important role in a modern interconnected economy. For every £3 of value added generated domestically (in the UK) for exporting, £2 is generated directly by the exporting industry and £1 is generated by their UK based suppliers.¹

Based on available data it is estimated that 9% of the UKs SMEs export and a further 15% are in the supply chains of other businesses that export.² This is based on the entire business population (both registered and un-registered). Using only registered businesses the proportion of SMEs that export is 10% and the proportion in supply chains is 17%.

It's also possible to make an estimate only of these businesses involved in supply chains for businesses in the EU. This gives an estimate that 8% of UK SMEs export to the EU and a further 15% are in the supply chains of other businesses that export to the EU.

Step by step process

To calculate the proportion of non-exporting UK SMEs in the supply chains of exporters the following steps were taken:

The population of SMEs

There are two possible business populations that could be used when considering the proportion of SMEs that are involved in supply chains. The Inter Departmental Business Register (IDBR) only captures registered businesses, i.e. those that have employees or are above the threshold for VAT. As such, many of the smallest businesses are not included in this dataset. The Business Population Estimates (BPE) in contrast estimates both registered and unregistered business.³

For completeness, estimates have been made using both registered and total business populations. However, the figure based on the BPE is presented in the final results as it

¹ BIS analysis based on TIVA data www.oecd.org/sti/ind/measuringtradeinvalue-addedanoecd-wtojointinitiative.htm

² Note that this paper brings together data from a variety of sources many of which use populations and definitions that do not entirely align, requiring certain assumptions to be used. Therefore the results should be considered indicative estimates.

³ www.gov.uk/government/statistics/business-population-estimates-2015

captures a more complete population and so is seen to be more representative of the UK SME population.

The proportion of SMEs that export

As the aim is to calculate the number of SMEs involved in supply chains over and above those which export directly it is first necessary to know how many SMEs are directly involved in exporting. For this, data from the ONS Annual Business Survey (ABS) is used.⁴ As this data does not include unregistered businesses they are assumed to behave in the same way as the smallest category of registered businesses. This procures an estimate of an average of 9% of small and micro (0-49 employees) and 33% of medium (50-249 employees) firms exporting.

Proportion of SMEs which supply other businesses

Of those businesses that do not export, they will either directly supply final consumers in the UK or businesses (or both). The Small Business Survey (SBS) asks SMEs who their main customers are. Among the SME population as a whole, 38% identified other businesses as their main customer. This is a lower bound as it only captures businesses who consider other businesses to be their main customer and so does not count businesses that mainly supply consumers but also supply some businesses. These businesses in turn may or may not be exporters.

Proportion of businesses supplied by SMEs which are themselves exporters

ABS data can be used to estimate how many of the businesses SMEs supply are themselves exporters. Using ABS estimates and treating unregistered businesses as detailed above, 9% of small businesses, 33% of medium businesses and 41% of large businesses export.⁵ The proportion of SMEs involved in supporting supply chains will depend on the size of the businesses they are supplying. In the absence of direct estimates turnover was used as a proxy for the relative share of intermediate consumption (i.e. how much of everything businesses buy is bought by each size category of business). This allows us to estimate that 29% of the businesses SMEs supply are themselves exporters. This is a lower bound as it assumes that a given SME either supplies only exporters or only non-exporters. In reality many SMEs will supply a mix of exporters and non-exporters, increasing this figure.

Businesses further down the supply chain

So far the calculations only consider SMEs that supply businesses that export. There may also be SMEs that are further down the supply chain - i.e. they supply businesses that supply businesses that export. To account for this a second calculation is run to calculate the probability that a firm of any size is the supplier for a firm that exports and this was applied to the remaining SMEs who identify business as their main customers but are not exporters or directly supplying exporters. This is then repeated to capture firms further

⁴ <http://webarchive.nationalarchives.gov.uk/20160105160709/http://www.ons.gov.uk/ons/publications/reference-tables.html?edition=tcm%3A77-420005>

⁵ <http://webarchive.nationalarchives.gov.uk/20160105160709/http://www.ons.gov.uk/ons/publications/reference-tables.html?edition=tcm%3A77-420005>

down the supply chain (i.e. they supply businesses that supply businesses which supply exporters and so on).

Supply chains exporting to the EU

HMRC data on exports shows that 82% of SME exporters export to the EU. Applying this to estimates from the Annual Business Survey gives an estimate of 8% of SMEs exporting to the EU.⁶

For the business population as a whole 78% of exporters export to the EU.⁷ Whether an SME in a supply chain is supplying at least one firm that exports to the EU will depend in turn on how many exporters it supplies. At a lower band, if each SME supplied only a single exporter, 78% of those SMEs in the supply chains would be supplying businesses that export to the EU. However few SMEs will have only a single customer; for example a report on business interaction by OCR international (a consultancy) found that of those SMEs that considered that they were part of a supply chain the largest share (37%) said that their largest supply relationship represented less than a quarter of turnover while only 18% said they represented more than half.⁸ Taking four customers as an average means that almost all (99.9%) of SMEs in exporters' supply chains will have at least one customer exporting to the EU. As no estimate for the number of customers is available, the calculation was re-run under a number of assumptions to test how sensitive it was to this assumption. All numbers of customers above two still produce a result of 15%. Assuming only two customers gives a result of 14%.

⁶ www.gov.uk/government/statistics/uk-trade-in-goods-by-business-characteristics-2014

⁷ www.gov.uk/government/statistics/uk-trade-in-goods-by-business-characteristics-2014

⁸ www.gov.uk/government/uploads/system/uploads/attachment_data/file/34639/12-1196-exploring-how-smes-interact-with-large-businesses.pdf

Data sources and assumptions

Note that this paper brings together data from a variety of sources many of which use populations and definitions that do not entirely align, requiring certain assumptions to be used. Therefore the results should be considered indicative estimates.

Business population

IDBR estimates of business population are based on VAT and PAYE registration. BPE takes the IDBR estimates and then uses Labour Force Survey and HMRC Self-Assessment data to estimate the number of unregistered businesses not included in the IDBR.

Businesses that export

For the proportion of UK firms that export ABS estimates are used as they cover small medium and large firms and provide separate estimates for each. ABS also uses a large sample size. Unfortunately these estimates do not cover non-registered businesses, businesses in Northern Ireland or certain sectors such as finance. It is therefore assumed that non-registered businesses and those in the omitted sectors behave in the same way as other small businesses, and that firms in Northern Ireland behave in the same way as other UK firms.

To ensure that this was robust the ABS estimates were compared against the SBS. The SBS covers a more comprehensive population for small business but does not include large businesses and uses a smaller sample size. The SBS estimates that 12% of small and micro businesses export, including 10% of non-employer businesses.⁹ The SBS gives higher rates of exporting for all sizes of SME suggesting that the use of ABS estimate is conservative and may lead to a small underestimate.

Exporting to the EU

HMRC data on exports shows that 82% of SME exporters export to the EU.¹⁰ This population only covers business exporting goods, and not services. It seems reasonable to assume that those firms that export services follow a similar pattern. This is supported by data from the UKTI internationalisation report. According to UKTI survey data 82% of exporters exported to Europe, and this figure covers both goods and services firms.¹¹ While it is possible services firms might be more or less likely to export to the EU small variations in this number do not have a large impact on the probability that SMEs are in an EU supply chain.

⁹ www.gov.uk/government/uploads/system/uploads/attachment_data/file/524063/bis-16-227-226-all-transparency-tables.csv

¹⁰ www.gov.uk/government/statistics/uk-trade-in-goods-by-business-characteristics-2014

¹¹ www.gov.uk/government/uploads/system/uploads/attachment_data/file/358353/Internationalisation_Strategies_Barriers_Awareness_Survey_2014_-_Full....pdf

Businesses that supply other businesses

This was based on data from the SBS. As the SBS only asks SMEs for their main customer, there may be a number of firms who do supply other businesses but do not consider them their main customer. As there is no way of knowing how many businesses are in this position we have taken the 38% as an estimate of the number of SMEs involved in supplying other businesses. This is a lower bound as it excludes businesses that supply other business as well as consumers and don't consider them their main customer.

Length of supply chains

In the main analysis it was assumed that there was no theoretical maximum to the length of a supply chain and so the process for estimating SMEs further down the supply chain was repeated eight times for completeness (the eighth iteration increased the result by less than 0.01 percentage points). To test the models sensitivity to the assumption about potential length of supply chains the model was re-run with various limits placed on the maximum length of supply chains. Setting the limit at four or higher had no impact on the result of 15%. Setting a limit of three reduced the result to 14% (although this was partly a rounding affect, the actual reduction was only 0.4%).

Characteristics of SMEs' business customers

Whilst large firms account for only a small percentage of total business numbers, they represent a significant share of output - accounting for over 50% of turnover according to the Business Population Estimates (BPE).¹² Taking a simple population weighted average of the proportion of businesses that export would fail to take into account the possibility that due to their size large, and to a lesser extent medium, firms are far more likely to be the ones buying the output of SMEs than small firms. As we do not have a direct figure for what proportion of intermediate consumption different sizes of firms account for a proxy is required. To reflect this we weight the average proportions of each size category which export by their relative turnover, on the assumption that the amount of inputs a business consumed will be correlated with the amount of output it produces. This gives a rough proxy of the likelihood that an SME will be supplying a business of any given size.

Sensitivity analysis was used to test how sensitive the result is to the number of customers each SME supplies - this showed that the result was very insensitive to changes in this assumption. Reducing the number of customers from four to three had no impact on the final result while reducing it to two changed it by only a single percentage point. As evidence from the OCR international report makes it very unlikely that most SMEs have only one or two customers this assumption is considered robust.

Comparison with other estimates

The Institute of Directors (IoD) carried out a survey of its members in which it asked members which business links its members had with the EU. 21% answered that they exported goods to the EU, 42% answered that they exported services and 34% estimated that they supplied businesses which trade with the EU. That these estimates are

¹²www.gov.uk/government/uploads/system/uploads/attachment_data/file/467443/bpe_2015_statistical_release.pdf

significantly higher than those produced in this paper is not surprising; the membership of the IoD is not necessarily reflective of the business population as a whole, particularly not the SME population on which this paper has focussed. Indeed, in presenting their results the IoD makes no claim that this represents anything other than the view of their members and the organisations they represent. The IoD figures may also capture firms which both export directly and are involved in supply chains, which the estimate produced in this paper deliberately excludes to prevent double counting.¹³ Estimates for how many of the UKs small and medium enterprises (SMEs) export vary. 2014 data from the ONS ABS suggests that just over a tenth (10.7%) of SMEs are exporters.¹⁴ This study looked at the population of registered businesses involved in exporting directly and did not differentiate between EU and non-EU exports.

The SBS also looks only at direct exporters but considers a different population, including both registered and unregistered business but not including large businesses. This estimated that 13% of SMEs were exporters. Like the ABS the SBS does not differentiate between EU and non-EU exports.

HMRC export data can be used to calculate an estimate of the number of goods businesses that export. Dividing the number of businesses that export to the EU by the total business population gives an estimate of 5%. However HMRC data on exporters only includes those firms involved in exporting goods while the total population also includes businesses providing services, which is why this figure is significantly lower than other estimates.

A report by OCR international (a consultancy) asked SMEs whether they considered themselves to be part of a supply chain.¹⁵ 77% of respondents considered themselves to be part of a supply chain. As well as firms supplying exporters this includes firms that are supplying customers but have a supply chain underneath them and firms in purely domestic supply chains, which explains why it is significantly higher.

¹³ www.iod.com/influencing/press-office/press-releases/iod-publishes-wide-ranging-survey-of-business-views-on-eu

¹⁴ <http://webarchive.nationalarchives.gov.uk/20160105160709/http://www.ons.gov.uk/ons/publications/reference-tables.html?edition=tcm%3A77-420005>

¹⁵ www.gov.uk/government/uploads/system/uploads/attachment_data/file/34639/12-1196-exploring-how-smes-interact-with-large-businesses.pdf



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