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The CBI Suite of Business Surveys

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Keywords: survey data, expectations, output, capacity

JEL classification: C80, E32, E71

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This paper provides an overview of the data sample, structure and uses of the data collected monthly since 2000 through the CBI's suite of business surveys. The surveys gather information from thousands of firms on various economic outcomes, both retrospectively and in expectation, and provide a rich source of real-time information on the state of the economy. This paper describes the questions posed, the sample frame - including details on the number and participation rates of respondents- the characteristics of the firm participants and a summary of the properties of the data relating to some key business cycle features, namely, movements in output, investment, capacity, and inventories.

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1 Introduction

This paper provides an overview of the data sample, structure and uses of the CBI suite of business surveys. There are four main surveys in the suite, comprising the long running Industrial Trends Survey, the Distributive Trades Survey, the Services Sector Survey and the Financial Sector Survey. The questions differ to reflect the nature of the business that is conducted in each sector. The surveys gather information from thousands of firms on various economic outcomes, both retrospectively and in expectation, and provide a rich source of real-time information on the state of the economy. This paper describes the questions posed, the sample frame - including details on the number and participation rates of respondents- the characteristics of the firm participants and a summary of the properties of the data relating to some key business cycle features, namely, movements in output, investment, capacity, and inventories.

The data from the CBI surveys have informed debate on the macroeconomic environment and provided an important input to policy formation since the first CBI surveys were conducted in the late 1950s. They have also been used in academic studies of the role of expectations in business cycle dynamics in the UK. Many of these studies have focused on the conversion of the survey responses into measures of expectations at the economy-wide level. These are then used to investigate the processes by which expectations are formed and the interplay between actual and expected outcomes at the macroeconomic level; see for example Pesaran (1984, 1987), Lee (1994), Driver and Urga (2004) and Lee and Shields (2007) among others. But the data also provides important insights on the expectations formation processes that take place at the firm-level. This allows an analysis of the processes underlying expectations formation, and the use of information, at a more microeconomic/individual-level; see, for example, Mitchell et al. (2002, 2004, 2007, 2013), Liu et al. (2010, 2011) and Boneva et al. (2019).

Despite this work, the data provided by the CBI surveys remain under-utilised. The questions posed relate to a wide range of economic magnitudes and, together with the fact that the surveys have been conducted for some time and on a monthly basis, means that they provide a detailed and timely description of the state of the economy over many years and at a relatively high frequency. Recent improvements in the frequency of publication of national statistics on actual outcomes as well as the break down of data to

the regional level - historically and in real time - and advances in time series econometric methods provides a new opportunity to exploit the CBI survey data. New insights can also be gained at the microeconomic level if the firms' survey responses can be matched with corresponding company accounts data (using for example Bureau van Dijk (FAME) or ONS Annual Business Survey data). For example, the relatively detailed explanations of the thinking behind firms' investment plans, as described in the survey, can be tied with accounting information available in company accounts. Once information is gathered on accounting data, it is possible to separate the responses in the CBI survey for firms that differ by size, region and sector. Moreover, the decisions about investment can be linked to qualitative responses in the survey on incentives and constraints on investment, and to other measures of activity such as production, sales, inventories and capacity utilisation and compared to the quantitative information in the accounts.

The purpose of this paper is to provide an overview of the CBI suite of business surveys. The next section describes the scope of the questions covered by the survey. Section 3 and 4 discusse the sample frame and the characteristics of firm participants (respectively). Section 5 is an examination of a select number of survey questions while Section 6 considers the usefulness of the survey suite. Section 7 makes a brief concluding remark.

2 Scope of the CBI Suite of Business Surveys

The CBI suite of business surveys constitutes four surveys completed by businesses operating in the UK. Participating firms provide qualitative information on a range of economic variables related to their business activity. These surveys are open to both members and non-members of the CBI. The survey suite traces its origins back to 1958 with the introduction of the Industrial Trends Survey (ITS) covering the UK manufacturing industry. Since then the survey suite has expanded with the addition of the Distributive Trades Survey (DTS), Financial Services Survey (FSS) - sponsored by PWC - and the Services Sector Survey (SSS) in 1983, 1989 and 1998 (respectively) with each survey covering their eponymous industrial sectors. These augmentations to the original survey result in a continuous source of data for the UK economy (categorised by industrial sector) dating from the turn of the century. Completion of each survey is voluntary meaning firms do not have to complete consecutive surveys and in fact after completing

one survey are under no obligation to participate in further survey rounds. It should be noted at this stage that analysis of this survey suite can only cover period after 2000 or period before 2000. This arises due to a change in the survey processing platform in 1999Q4 by the CBI making matching of firms before and after December 1999 impossible.

Each survey contains what the CBI label a Basic Data Section for the firms to compile. In this section they provide details on employees, value of direct exports (if applicable), annual turnover, geographic location, SIC code, type/nature of business (DTS and FSS), type of organisation (SSS only - for example subsidiary or enterprise) and basic company details (such as address). While this section of the surveys provides some useful additional variables on responding firms, it's key advantage lies in providing non-anonymised company details. This allows the CBI suite of business surveys to be combined with company account data to provide an even greater picture of the state of business in the UK.

2.1 Distribution and Publication of the Surveys

As Table 1 makes clear the ITS, SSS and DTS are conducted each month while the FTS is conducted quarterly. For the ITS, SSS and DTS a basic survey - the Monthly Trend Enquiry (column 2 of Table 1) - is conducted each month and thus is supplemented each quarter by additional questions from the CBI (column 3 of Table 1) and the Bank of England (column 4 of Table 1). The CBI and Bank of England (BoE) supplementary questions are contained in the same quarterly survey for the ITS. For the SSS and DTS the Bank of England supplementary questions supplement a standard Monthly Trend Enquiry survey with the CBI supplementary questions contained in a separate quarterly survey. In addition, the Bank of England changes a number of their supplementary questions in the FSS each quarter. Collection for the survey published in month t begins around the final week of month $t-1$ with publication of results around the final week of month t. For example, the January survey round questionnaire is issued around the last week of December with the concurrent results published around the last week of January.

2.2 Core Survey Questions

Table 2 provides an overview of the questions contained in the Monthly Trend Enquiry for the ITS, SSS and DTS; the inclusion of questions in the survey is indicated by Yes or No. Certain questions (for example on numbers employed or demand) have both a prospective and retrospective nature. In other words, firms are asked to provide their three-month ahead expectation and their past three-month backcast for these questions[1]. Note that discussion of the FSS is ignored in Table 2 as this survey is only run quarterly.

Demand as referenced in the surveys relates to volume of output, volume of business and volume of sales for the ITS, SSS and DTS (respectively). Each question in Table 2 is by nature trichotomous with responding firms providing qualitative answers. As a representative example consider the question where firms are asked in each survey what their expectations are regarding demand over the next three months - firms can respond by selecting "up", "same" or "down". No quantitative style questions are contained in any of the Monthly Trend Enquiries. As Table 2 indicates there is a moderate degree of crossover - in particular, questions regarding the volume of demand, domestic average selling prices and number of employees are present across all surveys. There are, however, a set of questions unique to the DTS. This unique set of questions asks respondents to assess the performance of a set of variables (for this month and their expectations for next month) with their past performance twelve and eleven months ago. This set of variables include volume of sales, volume of orders placed on suppliers, volume of sales, volume of stocks (in relation to expected sales), number of full-time employees, number of part-time employees, volume of internet sales and average price of goods sold over the internet (there is also an additional question asking about selling goods on the internet).

2.3 Supplementary Survey Questions

Table 3 provides an overview of the supplementary questions run each quarter by the CBI. Each of the questions contained in the Monthly Trend Enquiries (i.e. Table 2) are also contained in the surveys with the CBI supplementary questions[2]. As is evidenced

[1]The backward- and forward-looking time horizon was actually four months until July 2003.

[2]In addition to the questions listed in Table 3, the FSS also contain a set of additional questions which change each quarter (as these questions change on a regular basis they will not be considered in this study)

by Table 3 the CBI supplementary questions are more sector oriented and provide a more in-depth view of the operating environment of UK firms. Restricting attention to the Monthly Trend Enquiry alone results in the loss of this valuable information. The combined information of Tables 2 and 3 means that the CBI suite of business surveys are a valuable resource in determining the state of business in the UK (and in particular how firms themselves view the state of business).

The Bank of England supplementary questions (run every quarter) are quantitative in nature. The questions overlap in the surveys and relate to changes (in the past twelve months, in the next twelve months and the next twenty-four months - for general selling price) in the general level of selling prices in the UK markets in which the firm operates, the firm's own average selling price and the average cost per employee. In addition, the SSS contains a question regarding the ability of a firm to increase its volume of activity given its current resources (in particular if it can and if it can then by how much).

3 Sample Frame

This section will demonstrate clearly the impressive panel structure of the CBI suite of business surveys, in particular the extensive coverage and continuity of firms (which allows for the tracking of individual firms across time) across four sectors - a substantial number of which can be matched with company accounts data (providing other sources of quantitative information and allowing for further analysis).

3.1 Cleaning and Matching the Sample

Before examining the CBI dataset proper, some cleaning and matching techniques are employed. First, firms without a unique identification number are dropped from the sample. For reasons of anonymity, each firm that participates in at least one survey is provided with a unique identification number by the CBI so their responses can be tracked through subsequent survey waves. However, within the dataset a number of survey responses are not paired with a unique identification number. While it could be the case that these survey responses are all generated by one firm there is no guarantee this is true. Therefore, in order to ensure the highest level of accuracy possible all survey

responses without a corresponding unique identification number are dropped[3].

Second, firm responses recorded as N/A are designated as missing responses. For each trichotomous style question firms have a "fourth" option: N/A. For example, in the ITS when asked for their expectation for volume of demand firms can reply up, same, down or N/A. Recording these N/A answers as missing ensures calculating the percentages of firm responses to the survey questions are more accurate.

Third, the sample has been cleaned of all firms that participate in less than three consecutive survey waves. For example, only firms that participate in surveys from period t, $t+1$, and $t+2$ are kept. This ensures a degree of continuity among participating firms (in particular by eliminating firms who just complete one survey and sporadically participating firms). Therefore, only firms with a record of regular completion of the survey remain in the sample. This operation provides our data with its important time dimension and is a necessary requirement for examining both firm rationality and expectation errors - but results in a loss of around 50% of the responses[4]. References hereafter to the CBI dataset refer to this *cleaned subsample of firms*.

Fourth, using the Basic Data Section of each survey allows the firm survey responses to be matched to the firm company accounts data contained in the Bureau van Dijk FAME dataset. This matching process is based solely on firm names as this is the only unique firm identifier in the Basic Data Section. This strategy yields 1,749 matched firms generating 25,112 matched survey responses. This final step creates the *matched dataset*.

3.2 Timespan of the Survey Suite

Table 4 indicates the timespan available for each survey in the CBI dataset. Evidently both the ITS and DTS have the largest span - each with 74 consecutive quarters of survey responses. However, the same is not true of the FSS - data is missing for 2015 Q4, 2016 Q1, 2016 Q2 and 2016 Q4. In the case of the SSS, survey responses prior to 2005 Q4 are available but not the questions that were in the survey for these dates. Finally, it is worth highlighting that just because a survey runs for x number of consecutive quarters

[3]Overall, this has a minimal effect on the dataset: ITS loses 22 observations, the SSS 12 observations, the DTS 20 observations and the FSS 0 observations.

[4]The ITS loses 14,789 observations, the SSS loses 3,293 observations, the FSS loses 2,992 observations and the DTS loses 3,749 observations.

does not mean there are x observations for each survey question. For example, while there are 74 quarters of data for the DTS, questions regarding the quarterly expectation and realisation of volume of sales only began in 2003 Q4.

3.3 Number of Firm Participants

The coverage of the survey (in terms of the number of participating firms and the number of survey responses from 2000Q1 to 2018Q2) is presented in Table 5. The number of participating firms are the number of distinct firms partaking in each survey round while total survey responses detail the number of responses generated by these distinct participants. For example, if Firm A participates in the ITS by completing eight surveys from 2000Q1 to 2018Q2 then this is recorded as one observation in the Number of Firms column and eight observations in the Number of Responses column in Table 5. Furthermore, Firm A does not necessarily have to complete all eight surveys consecutively to be recorded in Table 5. For example, Firm A can complete three consecutive surveys, drop out for a number of quarters and later complete five consecutive surveys. Firms which drop out and re-enter will only have their newer survey responses recorded in Table 5 so long as they complete at least three consecutive surveys when they re-enter. For example, suppose Firm A drops out and re-enters by completing two consecutive surveys - this is not recorded in Table 5 and nor are their responses recorded in the cleaned subsample of firms. Given this criteria, over the course of the sample the average firm in the ITS completed around 14 surveys; in the SSS firms completed around 12 to 13 surveys; in the DTS firms completed 15 surveys and in the FSS firms completed 11 surveys. The ability to track individual firm responses throughout the sample period is an undoubted strength of this suite of business surveys.

Table 5 shows the CBI dataset predominantly consists of manufacturing firms (i.e. respondents to the ITS). In fact, there are over three times more firms in the ITS than in the survey with the next highest number of participants (i.e. the DTS).

Each cell of the third column in Table 5 presents, for each industrial classification covered by each of the surveys, the total number of firms operating in the UK (in 2018) according to the Inter-Departmental Business Register (IDBR)[5]. For example, while 2,093 manufac-

[5]Only firms VAT or PAYE registered are in the IDBR and by implication excludes small businesses

turing firms participated in the ITS over the period 2000Q1 to 2018Q2 there are 150,435 such firms in the UK in 2018. Comparing columns one and three of Table 5 it becomes clear that (in absolute number of firms) the CBI dataset is not representative of the UK. While manufacturing and mining firms constitute 60.06% of firms in the CBI dataset they only constitute 8.09% of firms in the industrial sectors surveyed by the CBI[6] (in 2018). The (almost) mirror image of this observation is encapsulated in the coverage of service firms: they constitute 12.22% of firms in the CBI dataset and 68.30% of firms in the industrial sectors surveyed by the CBI (in 2018). It is also evident that financial service firms are over-represented in the CBI dataset when considering the IDBR from 2018 (10.19% versus 3.14%) while the DTS is remarkably accurate (17.53% versus 20.46%).

The figures in parentheses in Table 5 provide the number of firms (and the corresponding number of survey responses) contained in the matched dataset. For example of the 2,093 firms that completed the ITS between 2000Q1 and 2018Q2, 1,060 of them are also recorded in the FAME dataset. These 1,060 firms generate 16,056 survey responses between 2000Q1 and 2018Q2. A comparison of the matched dataset with the CBI dataset reveals that the matched dataset contains 50.65%, 53.76%, 49.1% and 45.07% of firms in the ITS, SSS, DTS and FSS (respectively). Similarly, the matched dataset contains 54.08%, 48.56%, 51.53% and 44.93% of survey responses in the ITS, SSS, DTS and FSS (respectively).

3.4 Continuity of Observations in the Survey

Voluntary participation in the CBI suite of business surveys means that firms are under no obligation to complete surveys subsequent to their first. As a result, the number of participating firms and the continuity of observations from participating firms varies over the course of the sample. Figure 1 plots the number of participating firms in each quarter.

The ITS and DTS have both witnessed a downward trend over the course of the sample (with any increase in responses proving only temporary) while the SSS has witnessed a somewhat sustained and moderate increase. The FSS initially witnessed a steady

– however it does cover 99% of UK economic activity. Figures in the final column of Table 5 correspond to the appropriate UK SIC 2007 Section - aside from those for the SSS which excludes divisions 87 and 90

[6]That is the manufacturing and mining, service, distributive trade and financial service sectors

decline in responses but this has partially been reversed since 2007. Despite its continual downward trend in survey responses the ITS consistently remains the largest of the four surveys in terms of participating firms.

Further information on participating firms is provided by Figure 2 which graphs the number of firm entries and exits for each of the surveys. A firm entrant is a firm which did not complete the survey in $t-1$ but completes the survey in t, while an exiting firm completed the survey in $t-1$ but does not in t.

Figure 2 highlights that the number of firms entering per quarter does not compensate for the number of firms leaving per quarter. Nevertheless, the CBI dataset does demonstrate a degree of continuity among participating firms with 84.83%, 86.53%, 78.88% and 93.36% of firms in the ITS, SSS, DTS and FSS completing up to (and including) 20 consecutive surveys. However, the trend for each survey of the survey suite is clear: there is a declining number of firms consecutively completing a large number of surveys. For example while 4,488 firms complete three consecutive surveys only 161 complete 23 consecutive surveys and only 1 completes 74 (i.e. the full sample). In fact, the largest percentage of firms consecutively completing surveys in each case is 3 (15.12% for the ITS, 15.31% for the SSS, 11.77% for the DTS and 16.46% for the FSS).

4 Characteristics of Firm Participants

This section provides proof of the substantial level of detail collected on each firm that participates in the CBI suite of business surveys. By recording each firms number of employees (and thus firm size), their industrial classification and geographical location the CBI dataset thus allows for more detailed analysis of firm responses and how these change across each characteristic. In addition, the presentation of additional firm details available through the FAME dataset highlights the benefit of matching the CBI dataset with company accounts data. At this stage it is worth noting there is a discrepancy in the classification of firms (based on size, industrial classification and location) between the CBI and matched datasets. This could reflect that while data contained in the FAME dataset refers to the entirety of a firms operations, the CBI dataset may only contain information for a particular branch of the firm in a specific location or on its subsidiary. The section will conclude by providing some additional firm characteristics only available

through matching with the FAME dataset.

4.1 Size of Firm Participants

A breakdown of survey respondents and responses by firm size is provided by Table 6. Using the usual classification scheme, firm size is defined by numbers employed: micro (0 - 9 employees), small (10 - 49 employees), medium (50 - 249 employees) and large (250+ employees). The CBI does not ask firms to provide an exact employee number (as is provided by FAME) but rather to select an appropriate bin size in the survey - and employee numbers are then recorded as the upper limit of each bin. This collection methodology is subject to two limitations. First, the bin sizes have changed over the course of the sample resulting in some firms appearing to have grown in size (when in reality this is not the case). Second, the bin sizes are not constructed to properly reflect the standard firm size classification. For example, the first employee bin for the current iteration of the ITS is "1-199" - which improperly classifies micro, small and medium firms. Therefore, recourse to the matched dataset is needed when examining firm size.

The final row of Table 6 provides statistics from the IDBR for 2018. For example, while the matched dataset contains only 37 micro-firms, in the UK there are 2,384,800 such firms in 2018. In fact, micro-firms account for 89.34% of all firms in the UK but don't even account for 2% of the matched dataset. Accordingly small, medium and large-firms are oversampled in the CBI dataset.

4.2 Industrial Classification of Firm Participants

A breakdown of survey respondents and responses by industrial classification is provided by Table 7[7]. Table 7 aggregates industrial classifications for the ITS into primary and secondary designations as the individual surveys in the survey suite use different SIC codes. Primary manufacturing is defined as mining and the wood, coke, rubber, base metals, machinery and other manufacturing subsectors with secondary manufacturing being defined as the remaining manufacturing subsectors. For example, there are 734 primary manufacturing firms in the ITS generating 10,697 survey responses in Table 7. The remaining surveys in the survey suite are not aggregated into primary or secondary

[7]The CBI uses the industrial classification of firms for presentation and weighting purposes

designations and instead are classified based on the survey they have opted into. Incidentally, the ITS primarily uses SIC 80, the SSS primarily the SIC 92 and the DTS and FSS both use SIC 07 in their industrial classification.

4.3 Location of Firm Participants

A breakdown of survey respondents and responses by geographical location is provided by Table 8. Two things are of note. First, for the ITS London and Merseyside are classified in the South-East and North-West (respectively) - in the remaining surveys they are locations in and of themselves. Thus, any analysis based on location needs to account for this fact. Second, in the CBI (matched) dataset geographical location data is missing for 88.46% (86.36%) and 90.97% (90.76%) of survey responses in the SSS and FSS (respectively). This potentially reflects the nature of these industries with firms either being in multiple locations or operating on a scale larger than one geographical location.

4.4 Additional Firm Characteristics provided by FAME

The advantage of matching the CBI dataset with the FAME dataset is the additional information it provides on participating firms in the CBI dataset. As a result in the matched dataset firm size can be classified by balance sheet total or annual turnover (the CBI dataset only contains turnover data from 2010 onwards)[8] as well as specifying the company status and listing status of matched firms. These details are provided in Tables 9 - 12.

5 Responses to Selected Questions by Survey

This section will examine each survey of the CBI dataset individually focusing on questions relating to output, investment, inventories and capacity. Not all surveys have questions relating to these topics - only ITS and DTS have questions regarding inventories,

[8]This is accomplished using the classification scheme utilised when compiling company accounts: micro (turnover $\leq$ £632,000; balance sheet total $\leq$ £316,000), small (£632,000 $<$ turnover $\leq$ £6.5 million; £316,000 $<$ balance sheet total $\leq$ £3.26 million), medium (£6.5 million $<$ turnover $\leq$ £36 million; £3.26 million $<$ balance sheet total $\leq$ £18 million) and large (turnover $>$ £36 million; balance sheet total $>$ £18 million) where balance sheet total is the sum of current and fixed assets. Note that the definition of small firm changed in 2016 M1 - as the majority of the sample falls before this change the old classification is used.

while the ITS is the only survey to cover capacity. Given the large crossover between the individual surveys particular attention will be given to the ITS as it is the largest with the remaining surveys discussed more succinctly.

5.1 Selected Responses to the Industrial Trends Survey (ITS)

5.1.1 Output

Output in the ITS is defined as volume of production. Firms are asked (excluding seasonal variations) for their output expectation and realisation (i.e. quarterly forecast and backcast) - to which firms can respond up, same or down. The proportion of firms each quarter responding up, same and down is plotted in Figure 3a. While the proportion of firms selecting same clearly dominates prior to the financial crisis, this alters during the financial crisis and Great Recession when the proportion of firms selecting down sharply increases (with a corresponding decline in the proportion of firms selecting up or same). This period represents the largest gap between the proportions of firms reporting up and down. Post the Great Recession the proportion of firms selecting up peaks and despite a dip during 2015 remains elevated above pre-financial crisis levels. Correspondingly, the proportion of firms selecting down troughs during this period but nevertheless this period also represents a return to the domination of the proportion of firms responding same.

Figures 3b and 3c compares the proportion of firms selecting up and down for output expectations and realisations. While the correlation between the proportions for firms selecting up is 0.71 and 0.87 for firms selecting down there are some differences between the series. For example, for much of the sample period the proportion of firms retrospectively selecting down for quarter t exceeds the proportion of firms in the previous period when looking forward selecting down for quarter t - indicating (perhaps) a degree of over-optimism on the part of firms. In fact, there also appears to be a degree of pessimism around the financial crisis and Great Recession as firms underestimate their output volume.

In addition to questions regarding output expectations and realisations, firms in the ITS provide information each quarter on factors likely to limit their output over the next three months. The list of potential factors (excluding n/a) are orders or sales, skilled labour, other labour, plant capacity, credit or finance, materials or components and other (details

of which are not provided). Firms are not asked to rank these factors but they can select more than one. Out of the total number of factors selected each quarter the proportion of these responses attributable to each individual factor is depicted in Figure 3d. Only firms selecting same or down to the output expectation question are included in Figure 3d. Throughout the sample orders or sales is always the dominant factor limiting future output with the proportion of firms selecting this factor rarely falling below 60%. The time paths of the proportion of firms selecting plant capacity and skilled labour as the main factor limiting future output are broadly similar - that is, falling to a trough during the financial crisis and Great Recession and continuing to rise at the end of the sample. The proportion of firms selecting credit or finance as the main factor limiting future output peaks during financial crisis and Great Recession before slowly declining back to its original level.

5.1.2 Investment

Questions regarding investment fall into three categories in the ITS; the expectations and realisations of capital expenditure, factors positively influencing investment intentions and factors likely to limit future investment. Investment is categorised into four component in the ITS dataset - land and buildings; plant and machinery; product and process innovation and training and retraining. Specifically, firms are asked if they expect to authorise more, the same or less expenditure in the next twelve months than in the previous twelve months for each of these components. The proportion of firms each quarter responding more and less to each of these questions is plotted in Figures 4a - 4d. One common trend is obvious among the investment intentions of firms in the ITS: a reduction in capital expenditure during the financial crisis and Great Recession. Across each component of investment the proportion of firms selecting less increases while the proportion selecting more decreases. With respect to capital expenditure on land and buildings and plant and machinery the proportion of firms selecting less usually exceeds those selecting more (apart from a brief period c.2014-2015) - although the proportion of firms selecting more post the Great Recession (in general) exceeds its pre-crisis levels. In contrast, the proportion of firms selecting more for capital expenditure on both product and process innovation and training and retraining usually exceeds the proportion of firms exceed less - with the gap between the two series widening post-Great Recession as

the proportion of firms selecting less declines.

Potential factors positively influencing the decision to invest included in the ITS dataset are (excluding the non-applicable option): to expand capacity, to increase efficiency, for replacement and other (details of which are not provided). In fact, in the ITS firms are asked to rank these factors in order of importance to their decision-making - although this study will focus on the primary factors (that is, those selected as number one). The proportion of firms each quarter selecting each of these factors (including those selecting N/A) as their primary factor is plotted in Figure 4e. Only firms selecting up to at least one of the investment expectation questions is included in Figure 4e. Throughout the sample period investing to increase efficiency is usually the main factor selected by firms as a reason for investing - although the proportion of firms selecting this option declines throughout. This is in contrast to the proportion of firms selecting for replacement which remains fairly constant throughout the sample while the proportion of firms selecting to expand capacity increases notably after the financial crisis and Great Recession (during which the proportion of firms selecting this factor declined). The proportion of firms selecting either the other or non-applicable option rarely exceeds 10%.

Potential factors negatively influencing the decision to invest included in the ITS dataset are (excluding the non-applicable option): inadequate net return on proposed investment, shortage of internal finance, inability to raise external finance, cost of finance, uncertainty about demand, shortage of labour and other (details of which are not provided). In fact, in the ITS firms are asked to rank these factors in order of importance to their decision-making - although this study will focus on the primary factors (that is, those selected as number one). The proportion of firms each quarter selecting each of these factors (including those selecting N/A) as their primary factor is plotted in Figure 4f. Only firms selecting down or same to at least one of the investment expectation questions is included in Figure 4f. Throughout the sample period uncertainty about demand is always the primary limiting factor influencing investment - peaking at above 60% of firms during the financial crisis and Great Recession. In fact, the proportion of firms selecting this as the main factor limiting investment only falls below 40% towards the end of the sample. The proportion of firms selecting inadequate net return as the main factor limiting investment fluctuates around 30% prior to the financial crisis before falling

to below 20% during the financial crisis and Great Recession. The proportion of firms selecting a shortage of internal finance as the main factor limiting investment peaks at 20% during the financial crisis and Great Recession before reverting to levels prior to the financial crisis while the time path of shortage of labour is the opposite (qualitatively speaking).

5.1.3 Inventories

Inventories are categorised into three components in the ITS - raw materials and bought-in-supplies; work in progress and finished goods. Specifically, firms are asked (excluding seasonal variations) for their expectation and realisation (i.e. quarterly forecast and backcast) of each inventory component - to which firms can respond up, same or down. The proportion of firms each quarter responding up and down to each of these questions is plotted in Figures 5a - 5i. Expectations of raw materials and bought-in-supplies and work in progress both demonstrate similar trends - the proportion of firms selecting down dominate prior to the financial crisis; during the financial crisis and Great Recession the proportion of firms selecting down increases and the proportion selecting up decreases while post-Great Recession there is a lack of stability in the dominance of firm responses (although the proportion of firms selecting more has increased since the start of the sample while the proportion of firms selecting less has decreased). In contrast, the proportion of firms selecting up with respect to expectations of finished goods consistently exceeds the proportion of firms selecting down - while the proportion of firms selecting same increases consistently post the Great Recession (due in particular to the decline in the proportion of firms selecting down). Moreover, the time paths of the proportion of firms selecting up and down are broadly similar - in fact the correlation between them is 0.94. Firms in the ITS have a mixed record with regards to predicting their future inventory levels. The correlation between the proportion of firms selecting up is 0.62, 0.55 and -0.27 for raw materials and bought-in-supplies, work in progress and finished goods expectations and realisations (respectively). Moreover, there is a significant discrepancy between these proportions for each quarter t across the entire sample - especially regarding finished goods. In contrast, firms which select down are good predictors with a correlation of 0.91, 0.89 and 0.84 between the proportion of firms selecting down for raw materials and bought-in-supplies, work in progress and finished goods expectations and realisations

(respectively) with minimal discrepancies between these proportions.

5.1.4 Capacity

Firms in the ITS are asked if their present level of output below capacity - to which they can respond either yes or no (see Figure 6a). Aside from the end of the sample the proportion of firms selecting yes always exceeds the proportion of firms selecting no - with the gap between the two time paths widening during the financial crisis and narrowing post-Great Recession. Furthermore, the ITS also asks firms to detail their current rate of operation as a percentage of full capacity. In particular, firms can choose from twenty-one bins of five-increment percentages starting at 1% - 5% and ending at 100+% - results are presented in Figure 6b as the proportion of firms selecting each percentage bin each quarter with all firms selecting less than 76% being aggregated into one measure. The time paths depicted in Figure 6b indicate that during the financial crisis and Great Recession the proportion of firms operating at less than 76% increases markedly, while the proportion of firms operating at higher rates of capacity decreases.

5.2 Selected Responses to the SSS, DTS and FSS

5.2.1 Service Sector Survey (SSS)

Output in the SSS is defined as volume of business. Firm responses are depicted in Figure 7a which follows a path similar to Figure 3a. Figures 7b and 7c compare the proportion of firms selecting up and down for output expectations and realisations with a correlation of 0.76 for firms selecting up and 0.91 for firms selecting down. While there are some discrepancies between these proportions for each response, on the whole service firms appear to be relatively good predictors of their future business volume. Figure 7d examines the factors limiting output - note the additional options of domestic and overseas competition (and the lack of materials or components option). Only the time paths of future output limited by level of demand or sales and future output limited by availability of professional staff demonstrate any noticeable movement. In particular, the proportion of firms selecting the former increases during the financial crisis and Great Recession before slowly returning to its original level while the latter follows the mirror image (qualitatively speaking). Actually, the time path of future output limited by the

availability of clerical staff follows a similar (but less pronounced) path to output limited by the availability of professional staff.

The categorisation of investment in the SSS is (marginally) different to the ITS - land and buildings; vehicles, plant and machinery; information technology and training and retraining. Furthermore, capital expenditure on training and retraining refers to the three-month expectation and realisation (rather than twelve-month expectation only). Firm responses are depicted in Figures 8a - 8d each broadly following a path (qualitatively) similar to their ITS counterpart. Figures 8e and 8f compare the proportion of firms selecting more and less for capital expenditure on (re)training expectations and realisations with a correlation of 0.73 for firms selecting more and 0.92 for firms selecting less. Figure 8g depicts service firm responses to their expansion intentions over the next twelve months (vis-à-vis the preceding twelve months). The decision to expand is the predominate choice among service firms on either side of the financial crisis and Great Recession - events during that particular timeframe clearly had a significant impact on expansion intentions (which take four years to recover to their pre-crisis level). Figure 8h examines the factors encouraging investment - note the additional options to provide new services, to reach new customers, euro-related and e-business related. Throughout the sample period investing to increase efficiency and for replacement are consistently ranked as the main factor positively influencing investment with investing for replacement being predominant during the financial crisis and Great Recession. The proportion of firms selecting investment for expand capacity decreases during the financial crisis and Great Recession before recovering - although not quite to pre-crisis levels. The remaining time-paths do not follow any discernible pattern except for investment to provide new services, which decreases during the financial crisis and Great Recession before rising and exceeding pre-crisis levels. Figure 8i examines the factors limiting investment. Throughout the sample period uncertainty about demand or business prospects is always the dominant factor limiting investment. In fact, the proportion of firms selecting this as the main factor increases during the financial crisis and Great Recession and only slowly declines before beginning to increase again by the end of the sample. The remaining time paths do not demonstrate any discernible pattern save for investment limited by shortage of labour, investment limited by cost of finance and investment limited by inability to raise external finance. The former falls during the financial crisis and Great Recession before

slowly recovering to pre-crisis levels; the latter increases during the financial crisis and Great Recession before slowly returning to pre-crisis levels. Meanwhile, the proportion of firms selecting cost of finance falls during the financial crisis and Great Recession and remains lowered for the remainder of the sample.

5.2.2 Distributive Trade Survey (DTS)

Output in the DTS is defined as volume of sales. Firm responses are depicted in Figure 9a which follows a path similar to Figure 3a. Figures 9b and 9c compare the proportion of firms selecting up and down for output expectations and realisations with a correlation of 0.8 for firms selecting up and 0.85 for firms selecting down. Again, while there are discrepancies between the proportions firms in the DTS appear relatively good predictors of future sales volume.

The DTS does not categorise investment into components opting instead to ask firms if they expect to authorise more, the same or less capital expenditure in the next twelve months than authorised in the past twelve months. These investment intentions are depicted in Figure 9d which indicates a sharp increase in firms intending to invest less during the financial crisis and Great Recession. In fact, throughout the sample period the proportion of firms selecting less usually exceeds those selecting more (a notable exception being c.2014-2015). Questions regarding the factors influencing the investment decision are absent from the DTS.

The DTS does not categorise inventories into components but asks firms if their position with regard to their volume of stocks (in relation to expected sales) for the current month and expectations for the following month is too high, adequate or too low compared with those in the same month the previous year. Figures 9e and 9f indicate that the vast majority of firms in the DTS feel their volume of stocks are adequate with very few expressing concerns they are too low.

5.2.3 Financial Service Sector (FSS)

Output in the FSS is defined as volume of business. Firm responses are depicted in Figure 10a which follows a path similar to Figure 3a. Figures 10b and 10c compare the proportion of firms selecting up and down for output expectations and realisations with a

correlation of 0.63 for firms selecting up and 0.77 for firms selecting down. However, there are (at times) substantial differences in the time paths of the proportions. Accordingly, it seems that firms in the FSS are at best mediocre predictors of their future volume of business. Figure 7d examines the factors firms have ranked as number one in limiting their volume of business - note the additional options of level of staff turnover, ability to raise funds (of which ability to raise capital and availability of wholesale funds), competition (with options specifying domestic and overseas competition) and statutory legislation and regulation. The time paths of the proportion of firms selecting factors limiting future output appear to follow no discernible pattern. For example, none of the time paths appear to be overly affected by the financial crisis or Great Recession.

The categorisation of investment in the FSS is identical to the SSS (in all respects). Firm responses are depicted in Figures 11a - 11d each broadly following a path (qualitatively) similar to their ITS counterpart. Figures 11e and 11f compare the proportion of firms selecting more and less for capital expenditure on (re)training expectations and realisations with a correlation of 0.65 for firms selecting more and 0.84 for firms selecting less. Figure 11g examines the factors firms have ranked as number one in encouraging investment. The time paths of the proportion of firms selecting factors positively affecting investment appear to follow no discernible pattern. Figure 8i examines the factors firms have ranked as number one in limiting investment. The time paths of the proportion of firms selecting factors limiting investment appear to follow no discernible pattern.

6 Comments on the Usefulness of the CBI Suite of Business Surveys

After examining in detail the content and data of the CBI suite of business surveys three pertinent questions remain. First, is (qualitative) survey data reliable? Second, what are the benefits of utilising firm-level survey data? Third, how does the CBI suite of business surveys compare to alternative business surveys - especially regarding questions asked, sample frame and sample size? The first is answered by looking at firm responses to the Answering Practice Survey (APS) conducted by the CBI between 2009 and 2014. The second is answered by discussing the specific strengths of the CBI suite of business surveys and explicitly refuting perceived weaknesses. The third question is answered by

comparing the CBI suite of business surveys with the Office for National Statistics (ONS) business surveys.

6.1 Is (Qualitative) Survey Data Reliable? An Examination of the Answering Practices Survey (APS)

The APS is a questionnaire for participating firms of the ITS, SSS, DTS or FSS where respondents answer a series of questions regarding how they complete their designated survey. This subsection will provide an overview of relevant APS results for firms participating in the ITS, SSS, DTS and FSS. Analysing the APS results is important as it provides insight into how firms complete the CBI suite of business surveys - in particular by indicating how firms interpret the survey questions and potential answers (thus mitigating concerns regarding the accuracy of firm survey responses). There is only one set of APS results for each survey type over the period 2009-2014. In 2013 186 firms completed the ITS APS, in 2012 120 firms completed the SSS APS; in 2014 85 firms completed the DTS APS and in 2009 55 firms completed the FSS APS.

Tables 13 - 16 provide an overview of how firms complete each survey type. It is clear that each survey is completed by individuals in positions of authority within the firm who would have access to the required information to accurately complete each survey (Table 13), the vast majority of whom find this an easy process with their major difficulty being irrelevant questions for their firm (Table 14) and thus are less likely to provide inaccurate answers on the basis of lack of understanding. These findings mitigate against concerns regarding the accuracy of firm survey responses. Nor do firms fail to continually respond to surveys because they find them overly cumbersome or difficult (Table 15) - rather the primary culprit is a lack of available time on the part of the firm. Unfortunately, details regarding the length of time to complete the survey is only available for the DTS (Table 16) - however, 57% of distributive trade firms complete their survey within a week of reception implying the majority of DTS survey responses for quarter t are completed in the final week of quarter $t-1$.

Table 17 details how firms respond to questions asking them to exclude seasonal variation. Except for firms in the DTS, the majority of firms either do adjust for seasonal variation or do not as they are insignificant in their operation. However, while the CBI suite of

business surveys asks firms to exclude seasonal variations knowing this information allows for appropriate action to be taken during analysis. Tables 18 and 19 indicate that the vast majority of firms in the ITS and DTS do not adjust their answers to account for national events (such as the Queen's Jubilee or the Olympics or Paralympics) or for adverse or unseasonal weather conditions (DTS firms only). Table 20 indicates how firms select the answer bins "up" and "down" - in particular, illustrating the percentage of firms which regard "up/down" options as referring to "rising/falling" versus "rising/falling more quickly/slowly" - with the vast majority of firms regarding "up/down" as referring to the former. Table 21 details the range of movement in a variable firms regard as falling within the "same" answer, with the majority of firms categorising a movement of less than 4% as being the "same". Furthermore, Table 22 compares if the movement necessary for firms to answer "down" is lower, the same or higher than the movement necessary for them to answer "up" - with the results demonstrating the consistency with which firms in the ITS select option bins "up" and "down".

Tables 23 - 25 examine firm's understanding of the three-month period referred to in the survey questions. In particular, Table 23 affirms that the majority of firms (save in the DTS) answer their surveys by comparing quarter t with quarter $t-1$ (as intended by the survey question). The DTS potentially provides different results due to an earlier question asking firms to compare quarter t with quarter $t-5$. Similarly, Table 25, Table 26 examines whether firms in the ITS use values/revenues as an approximation for their volume measures (the majority in the affirmative). Table 27 examines if DTS firms adjust their value of sales for any price changes to derive their volume of sales measure (the majority do not). Table 28 asserts that the majority of firms in the ITS do not account for quality improvements while assessing volumes. Table 29 details how ITS firms which produce heterogeneous products make volume assessments.

Table 30 highlights that the majority of firms in the ITS selecting skilled labour as a constraint on future output are referring to the difficulties in recruiting skilled workers (be they cost or skilled related) while Table 31 details what these firms regard as skilled labour. Table 32 indicates that firms have a fairly mixed view as to uncertainty as a constraint on future investment. Table 33 examines the factors influencing firms in the SSS decisions to expand - with it being clear that sales and expected sales growth are

the largest contributors - while Table 34 details other considerations the firms may have while answering this question. Table 35 demonstrates the consistency with which firms in the DTS assess the adequacy of stocks in relation to sales for this month and next. Tables 36 - 40 examine the attitudes of firms in the ITS with regards to the capacity questions. While their answers certainly seem insightful it would perhaps be beneficial if questions such as these were in the actual ITS so firm responses could be tracked over time.

The key lesson from examining the APS responses is that firms accurately interpret and complete their designated survey. This provides reassurance regarding the reliability of the firm-level data contained in the CBI dataset.

6.2 The Benefits of Utilising Firm-Level Survey Data

6.2.1 Strengths of the CBI Suite of Business Surveys

The CBI suite of business surveys possesses a number of strengths which make it an excellent data source. First, in contrast to official statistics it provides a timely release of data. Official statistics are published with a lag and then are often subject to revision. However, as established from Table 1 data from the CBI is quickly available for inspection and analysis. In particular, firm-level forecasts (i.e. expectations) for each quarter are made available at the end of the first month of said quarter. Similarly, firm-level backcasts for the previous quarter are available at the end of the first month of the succeeding quarter. Thus, policymakers are quickly able to understand the state of the economy and react accordingly.

Second, the CBI dataset is a substantial one - covering a large number of firms over a significant time period. Focusing on the time-series aspect of the dataset, manufacturing and mining firms are surveyed by the CBI for over sixty years, while those with the shortest period of coverage (service firms) are surveyed for over twenty years. This timeframe covers a number of business cycles and economic events. For example, restricting attention to post-2000 ensures events such as the dot-com bubble, financial crisis, great recession, subsequent recovery and period around Brexit referendum are covered. Furthermore, the cross-section element of this dataset is equally substantial with a large number of firm participants each survey round. Moreover, with the inclusion of the basic data section in

each survey round this cross-section can be further analysed. Specifically, firms can be classified based on their location in the UK, their industry activity (using their SIC code), their firm size (based on employee numbers) and whether they are exporters. Thus, the CBI dataset contains information not only on the number of participants but also details on these participants. Furthermore, due to the nature of the survey suite individual firms can be tracked across time allowing for changes in firm responses to be examined as well as more in-depth analysis.

Third, as demonstrated by Tables 2 and 3 the CBI dataset contains information covering a wide range of economic variables. In fact, the greater the scope of variables covered by the CBI suite of business surveys the greater the ability to gain an insight into the thinking of economic agents operating in the UK. In addition, the consistency of firm responses (indeed the rationality of firms) can be examined by comparing their expectations in t with their own realisations from $t+1$. Crucially, the CBI suite of business surveys encapsulates the viewpoint of market participants conveying the "frame of mind of economic agents" as opposed to the views of non-market participants (Kabundi, 2004, p.6).

6.2.2 Discussion of the Qualitative Nature of the CBI Suite of Business Surveys

The CBI suite of business surveys predominately rely on questions with qualitative answers - i.e. trichotomous style questions with "up/same/down" (or equivalent) answer bins. Rather than firms selecting from one of three answer bins would it not be better if they provided a point estimate for the variable in question with a corresponding probability distribution? This solves resorting to quantification techniques and provides a ready uncertainty proxy. Indeed both Pesaran (1987) and Lui, Mitchell and Weale (2011) espouse augmenting existing qualitative surveys with explicit quantitative questions. Yet both Pesaran (1987) and Pesaran and Weale (2006) argue that qualitative tendency surveys are less likely suffer from measurement (and sampling) errors. Indeed, it seems reasonable to argue that it is easier for a firm to report they expect output to go "up" in the next three months than it is to provide a point estimate. Moreover, there are perfectly reasonable and justifiable quantification techniques. On this basis, reliance on qualitative data is not an issue. Furthermore, through reference to the APS other

perceived issues regarding the use of qualitative data can be refuted. For example, there is no confusion regarding what firms mean by "up/down" or indeed the magnitude of change in a variable required for a firm to select "up/down".

6.3 How does the CBI Suite of Business Surveys Compare with the ONS Business Surveys?

The purpose of this section is to directly contrast the CBI Suite of Business Surveys with a selection of the Office for National Statistics (ONS) Business Surveys – namely the Annual Business Survey (ABS)[9], the Monthly Business Survey (MBS)[10], the Quarterly Acquisitions and Disposals of Capital Assets Survey (QADCAS)[11], the Quarterly Stocks Survey (QSS) and the Retail Sales Index (RSI). Data for each ONS Business Survey is available from 2000 to onwards.

A brief overview of the ONS Business Surveys is provided in Table 41. A number of points of interest arise from Table 41. First, the sample size in each survey wave for the ONS Business Surveys far exceeds the sample size in each survey wave in the CBI Suite of Business Surveys. Although the CBI Suite of Business Surveys has more survey waves than the ABS, the same number as the QADCAS and fewer than the MBS. Second, the IDBR constitutes the sampling frame for the ONS Business Surveys with stratified random sampling determining sample selection (but for the ABS and MBS large firms are always sampled). Selected firms are required by law to complete the survey. In contrast, selection for the CBI is based on firms (i.e. firms themselves self-select whether to complete the surveys). However, this means that firms in the CBI dataset can decide to complete as many (or as little) surveys as they would like. Accordingly, in the CBI dataset it is possible to track individual firms' responses across survey waves – something not possible on a continuous basis for the ONS Business Surveys (save for large firms in the ABS and MBS). Third, while the CBI Suite of Business Surveys provides a timely release of economic data the same is not true for the ONS Business Surveys. For example, ABS preliminary national results for year t are published in November $t+1$ with finalised

[9]The ABS replaced the Annual Business Inquiry - part 2 in 2009

[10]The MBS was an amalgamation of the Monthly Production Inquiry (MPI) and the Monthly Inquiry into the Distribution and Services Sector (MIDSS) in 2010 M1

[11]The QADCAS was an update of the Quarterly Capital Expenditure Survey (QCES) in 2015 Q1

national results published in June $t + 2$[12]. QADCAS preliminary results for quarter t are published in $t + 1$ with final results available in $t + 2$. Fourth, the rationale of each survey set differs. One (ONS Business Surveys) aims to collect company data in order to construct national statistics while the other (CBI Suite of Business Surveys) focuses on creating an account of firm's thinking at regular intervals. As a result, each ONS Business Survey covers a specific topic (or set of topics) providing quantitative information as opposed to the more broad-ranging CBI Suite of business Surveys with qualitative data. For example, none of the ONS Business Surveys provides expectation or forecast data (in contrast to the CBI Suite of Business Surveys).

The aim of this brief comparison is not to assert the superiority of one set of surveys over the other. The two key distinctions between the CBI suite of business surveys and ONS business surveys relate to the scope of questions and the use of quantitative versus qualitative data. For example, only with the CBI dataset can an expectations and uncertainty series be created. Only the CBI dataset provides an insight into investment constraints, output constraints and a measure of firm-level capacity. In contrast, only the ONS survey data provides quantitative data regarding capital (for example). Both contain useful, complementary information that combined can be very beneficial.

7 Concluding Remarks

The CBI suite of business surveys is an excellent source of data regarding firms operating in the UK. It has an excellent panel structure (including both a substantial cross-section of firms over a significant time horizon) which also allows individual firm responses to be tracked over time. While the CBI dataset covers a wide range of important topics the ability to match individual firm responses with company accounts data opens up the possibility of further areas of study. Plus, through the APS greater reliability can be placed on individual survey responses - overcoming a drawback often associated with the use of survey data.

[12]ABS regional final results are published in July $t + 2$

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A Tables and Graphs

Table 1: Survey Timings

	Monthly Trend Enquiry	**CBI Supplementary Questions**	**BoE Supplementary Questions**
ITS	February, March, May, June, August, September, November, December	January, April, July, October	January, April, July, October
SSS	January, March, April, June, July, September, October, December	February, May, August, November	January, April, July, October
DTS	January, March, April, June, July, September, October, December	February, May, August, November	January, April, July, October
FSS		March, June, September, December	March, June, September, December

Table 2: Monthly Trend Enquiry Questions

	ITS	**SSS**	**DTS**
Confidence Indicator	No	Yes	Yes
Present Order Book	Yes	No	No
Stock of Finished Goods	Yes	No	No
Demand	Yes	Yes	Yes
Supply	No	No	Yes
Domestic Average Selling Price	Yes	Yes	Yes
Employees	Yes	Yes	Yes

Table 3: CBI Supplementary Questions

	ITS	SSS	DTS	FSS
Optimism	Yes	Yes	No	Yes
Investment	Yes	Yes	Yes	Yes
Capacity	Yes	No	No	No
Employees	Yes	Yes	Yes	Yes
Total New Orders	Yes	No	No	No
Deliveries	Yes	No	No	No
Stock	Yes	No	Yes	No
Average Cost per Output	Yes	No	No	No
Average Selling Price	Yes	Yes	Yes	No
Present Order Book	Yes	No	No	No
Factors Limiting Output	Yes	Yes	No	Yes
Factors Limiting Export Orders	Yes	No	No	No
Competitiveness	Yes	Yes	No	No
Present Fixed Capacity	Yes	No	No	No
Investment Influences	Yes	Yes	No	Yes
Present Level of Business	No	Yes	No	Yes
Value of Business	No	Yes	No	Yes
Average Commission	No	Yes	No	Yes
Total Costs per Employee	No	Yes	No	No
Profitability	No	Yes	No	Yes
Expansion Intentions	No	Yes	No	No
Supply from Imports	No	No	Yes	No
Overall Business Situation	No	No	Yes	No
Marketing Expenditure	No	No	No	Yes
Staff Turnover	No	No	No	Yes
Staff Costs	No	No	No	Yes
Value of Insurance Claims	No	No	No	Yes
Value of Fee	No	No	No	Yes
Value of Net Interest	No	No	No	Yes
Value of New Business	No	No	No	Yes
Average Spreads	No	No	No	Yes
Total Operating Costs	No	No	No	Yes
Average Operating Costs	No	No	No	Yes
Value of Non-Performing Loans	No	No	No	Yes
Value of Insurance Contracts	No	No	No	Yes

Table 4: Span of the CBI Suite of Business Surveys

	First Period	**Final Period**
ITS	2000 Q1	2018 Q2
SSS	2005 Q4	2018 Q2
DTS	2000 Q1	2018 Q2
FSS	2000 Q4	2018 Q2

Table 5: Sample Size of CBI Dataset

	Number of Firms	**Number of Responses**	**Firms in the IDBR (2018)**
ITS	2,093 (1,060)	29,692 (16,056)	150,435
SSS	426 (229)	5,329 (2,588)	1,269,380
DTS	611 (300)	9,229 (4,756)	380,230
FSS	355 (160)	3,810 (1,712)	58,410

Parenthesised figures refer to matched dataset

Table 6: Firmsize (Defined by Employee Numbers) of Dataset

		Micro	Small	Medium	Large	Total
ITS	**Firms**	2 (17)	605 (124)	1,603 (558)	576 (646)	2,786
	Responses	2 (116)	7,570 (1,253)	16,520 (7,403)	5,600 (7,276)	29,692
SSS	**Firms**	39 (4)	124 (12)	174 (84)	179 (166)	516
	Responses	391 (27)	1,391 (72)	1,682 (759)	1,865 (1,729)	5,329
DTS	**Firms**	0 (9)	183 (34)	197 (108)	315 (211)	695
	Responses	0 (27)	2,351 (287)	2,162 (1,348)	4,716 (3,094)	9,229
FSS	**Firms**	0 (7)	132 (34)	129 (56)	147 (96)	408
	Responses	0 (35)	1,280 (223)	1,205 (486)	1,325 (968)	3,810
Total	**Firms**	41	1,044	2,103	1,217	4,405
	Responses	393	12,592	21,569	13,506	48,060
Firms in the IDBR (2018)		2,384,800	233,040	41,380	10,220	2,669,440

Parenthesised figures refer to matched dataset

Table 7: Industrial Classification of Firm Participants

	Firms	**Responses**
Primary Manufacturing	734 (320)	10,697 (4,748)
Secondary Manufacturing	1,386 (584)	18,994 (9,042)
Services	426 (296)	5,329 (3,413)
Distributive Trades	611 (289)	9,229 (4,811)
Financial Services	355 (137)	3,810 (1,424)
Missing	1 (124)	1 (1,674)

Parenthesised figures refer to matched dataset

Table 8: Location of Firm Participants

		ITS	SSS	DTS	FSS	Firms in the IDBR (2018)
Wales	**Firms**	169 (141)	12 (12)	7 (7)	1 (3)	103,530
	Responses	1,977 (2,179)	155 (117)	66 (60)	5 (13)	
Scotland	**Firms**	193 (53)	28 (7)	9 (3)	2 (5)	174,730
	Responses	2,397 (758)	311 (88)	65 (27)	9 (20)	
Northern Ireland	**Firms**	43 (105)	8 (0)	2 (1)	0 (0)	73,120
	Responses	557 (1,564)	112 (0)	17 (3)	0 (0)	
North East	**Firms**	103 (61)	13 (7)	4 (2)	1 (0)	69,390
	Responses	1,279 (741)	241 (124)	20 (16)	3 (0)	
North West	**Firms**	199 (118)	28 (11)	14 (8)	3 (1)	267,765
	Responses	2,363 (1,909)	353 (87)	83 (39)	14 (6)	
Merseyside	**Firms**	-	0	1	0	-
	Responses	-	0	3	0	
Yorkshire and the Humber	**Firms**	228 (0)	14 (20)	8 (10)	9 (4)	183,275
	Responses	3,168 (0)	158 (157)	63 (69)	37 (20)	
East Midlands	**Firms**	219 (68)	18 (4)	10 (4)	3 (0)	178,745
	Responses	2,892 (925)	351 (40)	73 (43)	15 (0)	
West Midlands	**Firms**	284 (114)	26 (19)	14 (5)	5 (4)	212,505
	Responses	4,341 (1,483)	339 (227)	97 (34)	22 (16)	
South West	**Firms**	201 (101)	32 (8)	10 (10)	3 (2)	231,745
	Responses	3,080 (1,705)	364 (141)	75 (73)	13 (11)	
East of England	**Firms**	110 (87)	34 (19)	11 (2)	6 (2)	263,900
	Responses	1,537 (1,203)	440 (185)	86 (19)	23 (9)	
South East	**Firms**	435 (213)	45 (10)	19 (4)	11 (0)	404,560
	Responses	6,097 (3,230)	465 (172)	112 (40)	57 (0)	
London	**Firms**	- (23)	66 (3)	5 (1)	28 (0)	506,175
	Responses	- (357)	583 (33)	38 (5)	128 (0)	
Whole UK	**Firms**	2	135	40	4	-
	Responses	2	1,453	267	18	
Unanswered	**Firms**	2 (2)	3 (2)	564 (275)	321 (140)	-
	Responses	2 (2)	4 (3)	8,164 (4,107)	3,466 (1,522)	

Parenthesised figures refer to matched dataset

Table 9: Firmsize (Defined by Balance Sheet Total) of Matched Dataset

		Micro	Small	Medium	Large
ITS	**Firms**	13	239	575	508
	Responses	79	2,838	7,656	5,483
SSS	**Firms**	2	38	105	125
	Responses	5	355	1,023	1,205
DTS	**Firms**	3	45	122	178
	Responses	21	595	1,485	2,655
FSS	**Firms**	1	15	32	133
	Responses	3	142	283	1,284

Micro (balance sheet total $\leq$ £316,000), Small (£316,000 $<$ balance sheet total $\leq$ £3.26 million), Medium (£3.26 million $<$ balance sheet total $\leq$ £18 million) and Large (balance sheet total $>$ £18 million)

Table 10: Firmsize (Defined by Annual Turnover) of Matched Dataset

		Micro	Small	Medium	Large
ITS	**Firms**	6	214	522	675
	Responses	56	2,027	6,038	7,935
SSS	**Firms**	2	40	87	148
	Responses	18	290	856	1,424
DTS	**Firms**	3	27	111	226
	Responses	4	202	1,395	3,155
FSS	**Firms**	3	30	58	112
	Responses	7	215	431	1,059

Micro (turnover $\leq$ £632,000), Small (£632,000 $<$ turnover $\leq$ £6.5 million), Medium (£6.5 million $<$ turnover $\leq$ £36 million) and Large (turnover $>$ £36 million)

Table 11: Company Status of the Matched Dataset

		ITS	SSS	DTS	FSS
Active	**Firms**	883	206	240	141
	Responses	13,939	2,411	4,023	1,462
Active (Dormant)	**Firms**	25	3	7	1
	Responses	184	43	64	22
Active (Receivership)	**Firms**	3	0	0	0
	Responses	34	0	0	0
In Administration	**Firms**	13	0	7	0
	Responses	284	0	101	0
In Default	**Firms**	1	0	2	0
	Responses	28	0	7	0
Voluntary Arrangement	**Firms**	1	0	2	0
	Responses	12	0	31	0
Dissolved	**Firms**	109	16	34	15
	Responses	1,201	106	435	191
In Liquidation	**Firms**	26	4	8	3
	Responses	374	28	95	37

Table 12: Listing Status of the Matched Dataset

		ITS	SSS	DTS	FSS
Delisted	**Firms**	29	8	16	14
	Responses	308	43	277	159
Listed	**Firms**	30	12	8	17
	Responses	453	126	66	169
Unlisted	**Firms**	1,001	209	276	129
	Responses	15,295	2,419	4,413	1,384

Table 13: APS: Who Completes the Survey?

	ITS	SSS	DTS	FSS
Chairman [a]	60%	55%	46%	60%
Director of Function [b]	24%	24%	18%	16%
Planning and Strategy Director	0%	1%	1%	0%
General Manager [c]	12%	11%	14%	9%
Owner Partner	-	-	7%	-
Manager/Stock Controller	-	-	7%	-
Other	4%	9%	6%	15%

[a] or managing director, CEO, deputy chairman, vice-president
[b] example: finance, marketing, commercial, portfolio, corporate actuary
[c] or company secretary/accountant

Table 14: APS: Are the Quarterly Surveys Easy to Complete?

	ITS	SSS	DTS	FSS
Yes	69%	79%	-	69%
No; questions not wholly relevant	25%	16%	-	29%
No; inappropriate time horizon	2%	2%	-	2%
No; other	5%	6%	-	5%

Firms can select more than one reason in answering no

Table 15: APS: Reason for Firm Non-Response

	ITS	SSS
Length of survey	23%	20%
Lack of time	41%	39%
Number of Other Surveys	10%	12%
Low priority	22%	22%
Absence	27%	18%
Other	5%	3%

Table 16: APS: Response Length

	DTS
1-2 Days	26%
3-7 Days	31%
8-12 Days	24%
13-14 Days	16%
Unanswered	3%

Table 17: APS: Do Firms Adjust for Seasonal Variation?

	ITS	SSS	DTS	FSS
Yes; subjectively	36%	56%	11%	47%
Yes; quantitative procedure	8%	19%	2%	22%
No; not significant	44%	20%	-	25%
No; impossible to measure	10%	4%	-	2%
No; other	1%	1%	-	4%

87% of firms in the DTS do not adjust for seasonal variation (reasons are not provided)

Table 18: APS: Do Firms Adjust for National Events?

	ITS	DTS
Yes	6%	4%
No	94%	96%

Table 19: APS: Do Firms Adjust for Adverse or Unseasonal Weather?

	DTS
Yes	11%
No	89%

Table 20: APS: How do Firms Report Up and Down on Volume Questions?

	ITS	SSS	DTS	FSS
Rise/Fall	92%	83%	-	85%
Rise/Fall more quickly	5%	17%	-	15%
Don't Answer	3%	-	-	-

Table 21: APS: Range of Movement Falling within the Reply the Same

	ITS	SSS	DTS	FSS
0%	-	-	22%	-
1%	12%	6%	36%	0%
1-2%	28%	26%	28%	29%
2-4%	34%	26%	8%	42%
4-8%	25%	33%	-	27%
>8%	-	8%	-	2%
Don't Answer	-	-	5%	-

1% of firms in the DTS select >4%

Table 22: APS: How is the Movement for ITS Firms to Select Down Compared with Up?

	ITS
Lower	4%
Same	92%
Higher	3%

Table 23: APS: How do Firms Understand the Three Month Period

	ITS	SSS	DTS	FSS
Change during period	15%	18%	15%	16%
Compare as whole with previous period	66%	48%	19%	65%
Compare with same period previous year	10%	18%	54%	5%
Combination of above	8%	15%	11%	13%
Other	2%	2%	0%	0%

Table 24: APS: Primary Influences on Trend over Next Three Months

	ITS	SSS
Current conditions and recent trends	24%	53%
Planned activity within firm	20%	23%
Prediction of trends within sector	9%	-
Prediction of trends in UK/Global economy	3%	3%
Independent of past quarter	-	3%
Other	2%	1%

Firms in the FSS are also asked this question but given different options: 65% of firms selected recent trends, 80% select current conditions, 13% select firm specific factors, 9% select company forecasts/budgets, 20% trends in the, 0% select other

Table 25: APS: How Firms Measure Trend in Volume of Business

	SSS	FSS
Number of transactions	15%	60%
Number of hours billed	8%	0%
Value of income received	48%	89%
Subjective Assessment	10%	24%
Other	3%	7%

Table 26: APS: Do ITS Firms use Values/Revenue as an Approximation for Volume?

	ITS
Yes; adjusted for price change	40%
Yes; not adjusted for price change	30%
No	30%

Table 27: APS: Do DTS Firms Adjust the Value of Sales for any Price Changes to Derive a Volume of Sales Measure?

	DTS
Yes; have sales volume data	7%
Yes; use average price change over year	4%
Yes; use prevailing prices	6%
Yes; make subjective assessment	15%
Yes; other	1%
No	66%

Table 28: APS: Do ITS Firms Account for Quality Improvements in Assessing Volumes?

	ITS
Yes	26%
No	66%
Don't Know	8%

Table 29: APS: How ITS Firms Producing an Heterogeneous Product Assess Volumes

	ITS
Subjective Assessment	30%
Quantitative Procedure	12%
Other	2%

The remaining 54% of ITS firms do not produce an heterogeneous product

Table 30: APS: What Does Skilled Labour as a Constraint on Future Output Reflect?

	ITS
Current Workforce Only	44%
Difficulties recruiting; cost	1%
Difficulties recruiting; availability	31%
Difficulties recruiting; combination of cost/availability	20%
Don't Answer	3%

Table 31: APS: What Does Skilled Labour Constraint Refer to?

	ITS
Mainly production line workers	33%
Mainly managerial/technical skills	21%
Combination of above	36%
Other	4%
Unanswered	6%

Table 32: APS: What Does Uncertainty about Demand as a Limit on Future Investment Reflect?

	ITS
Weak outlook for demand across economy	28%
Weak outlook for demand in their sector	35%
Uncertain outlook for demand in the economy	32%
Uncertain outlook for demand in their sector	38%
Other	2%

Table 33: APS: What Factors Do Firms in the SSS Consider Most Relevant for Expansion Intentions?

	SSS
Sales expectation of coming year compared to past	74%
Expectation of greater capacity in 12 months	41%
Extent of currently unused capacity	38%
Expected sales growth acceleration	52%
Other	5%

Table 34: APS: What Do Firms in the SSS Consider when Answering Expansion Intentions?

	SSS
Extent of price discounting	36%
Severity of Competition	71%
Rising business costs in the UK	38%
Outlook to the Economy	63%
Increasing regulatory compliance	28%
Extent of unused capacity	29%
Other	3%

Table 35: APS: What Do Firms in the DTS Assess the Adequacy of Stocks in Relation to?

	Current Month	**Next Month**
Current sales	26%	6%
Expected sales	16%	34%
Combination of above	34%	34%
Past levels/historical average of stock/sales ratio	6%	6%
Subjective assessment	13%	14%
Other	1%	1%

Table 36: APS: Do ITS Firms Only Measure Current Output Solely Against Physical Capacity?

	ITS
Yes	56%
No; include utilisation of labour	40%
No; include financial resources	12%
No; include raw materials	12%
No; other	6%

Table 37: APS: What do ITS Firms Measure Current Output Against?

	ITS
Level of capacity available immediately	43%
Longer term measure of capacity	52%
Other	5%

Table 38: APS: What do ITS Firms Regard as a Satisfactory Full Rate of Operation?

	ITS
Working at full capacity	24%
Working at greater than 90%	6%
Working between 80% and 90%	49%
Working below 80%	11%
Qualitative assessment	10%

Table 39: APS: Do ITS Firms Regard their Current Satisfactory Rate of Operation Different to Five Years Ago?

	ITS
Yes; higher	24%
Yes; lower	13%
No	62%

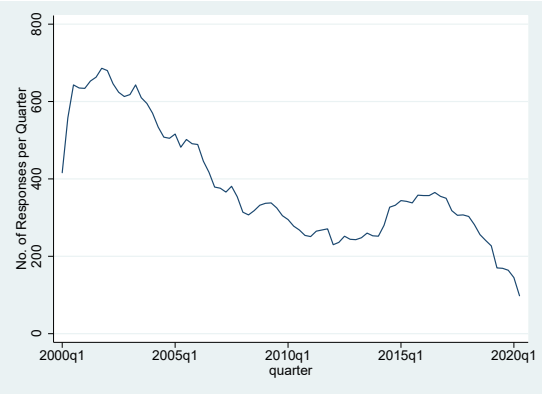
Table 40: APS: Are ITS Firms Working Closer to or Further From Full Capacity than Five Years Ago?

	ITS
Closer to	40%
Further from	38%
No change	22%

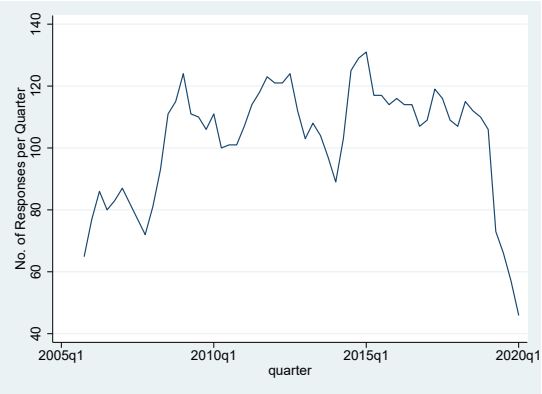
Table 41: Overview of ONS Business Surveys

	ABS	MBS	QADCAS
Sample Size	73,000 (63,000 in Britain and 11,000 in Northern Ireland)	32,000	27,000
Sample Frame	IDBR	IDBR	IDBR
Sample Selection	• Stratified random sampling • Large firms (>250 employees) always included	• Stratified simple random sampling • Large firms (industry-specific) always included	• Stratified simple random sampling
Sample Period	2000 - 2017	2000M1 - 2018M4	2000Q1 - 2016Q1
Variables	• Total turnover • Approximate gross value added at basic prices • Total purchases of goods, materials and services • Total employment • Total average employment • Total employment costs • Total net capital expenditure • Total stocks and work in progress • Industry-specific questions	• Total turnover • Export turnover • Total new orders • Export new orders • Employment	• Major improvements and construction work • Machinery and equipment • Intellectual property assets • Total value of acquisitions and proceeds from disposal of assets

Figure 1: Responses per Quarter

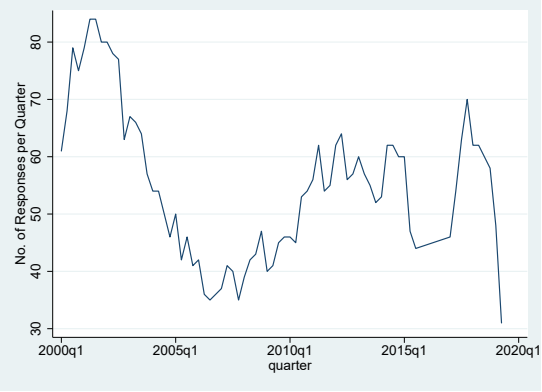


(a) Manufacturing and Mining Firms



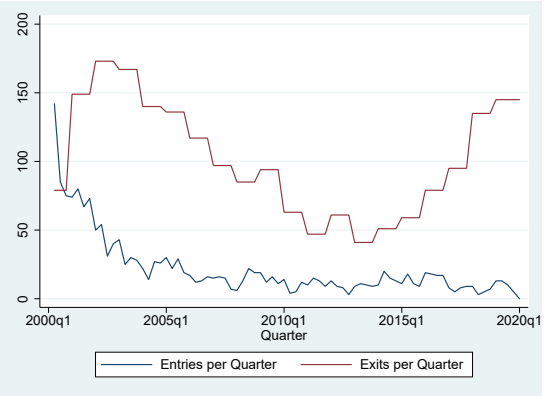
(b) Service Firms

(c) Distributive Trade Firms

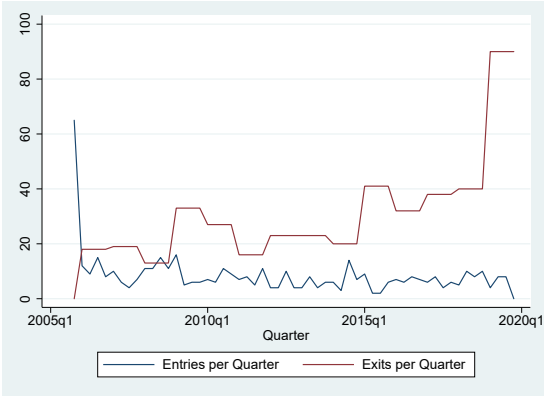


(d) Finance Service Firms

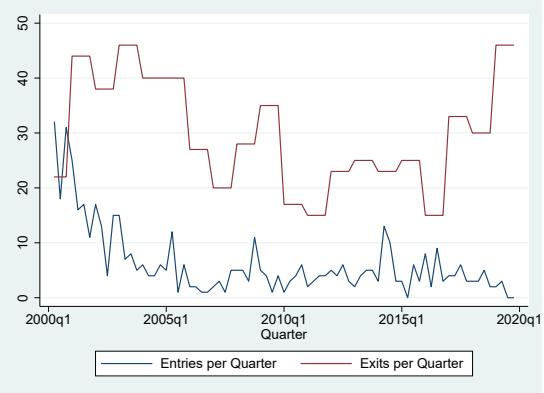
Figure 2: Entry and Exit of Firms



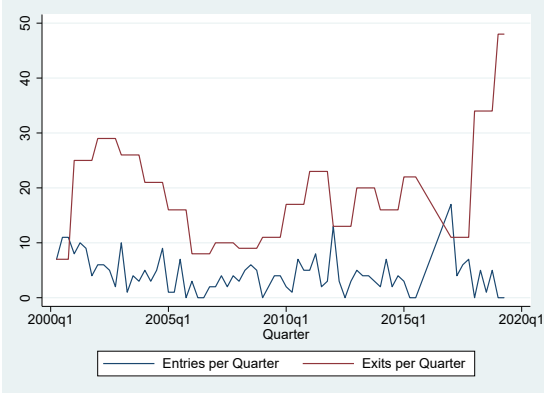
(a) Manufacturing and Mining Firms



(b) Service Firms

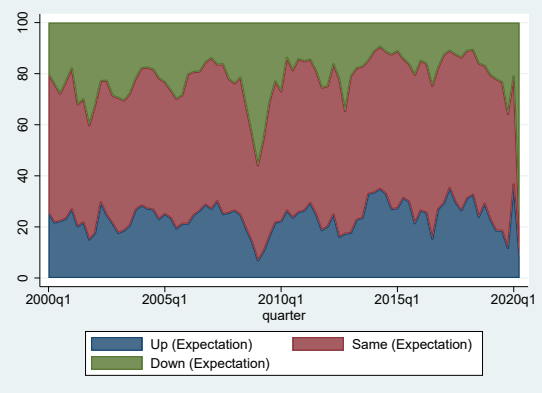


(c) Distributive Trade Firms

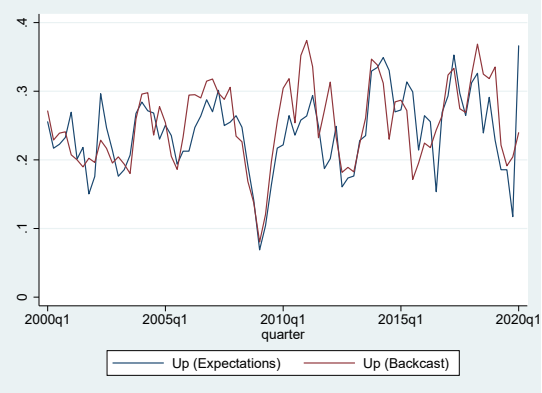


(d) Finance Service Firms

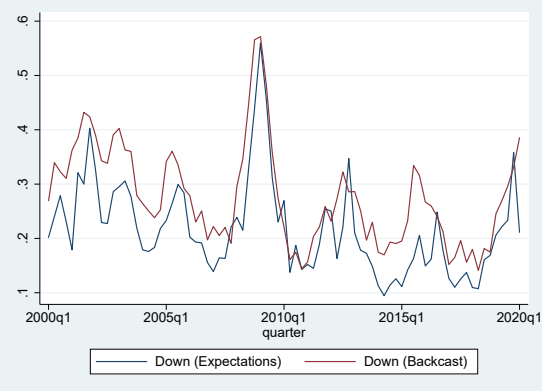
Figure 3: ITS: Questions Related to Output



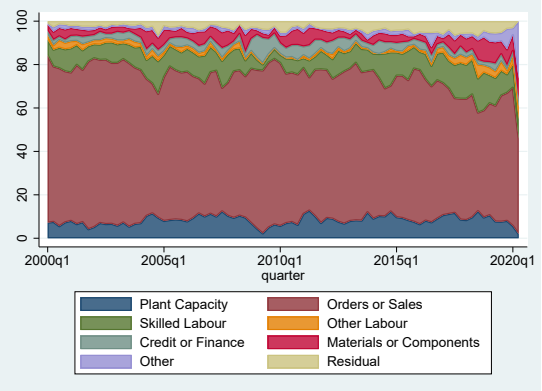
(a) Proportion of Firms Responding Up, Same, Down



(b) Expectation and Realisation of Output (Up)

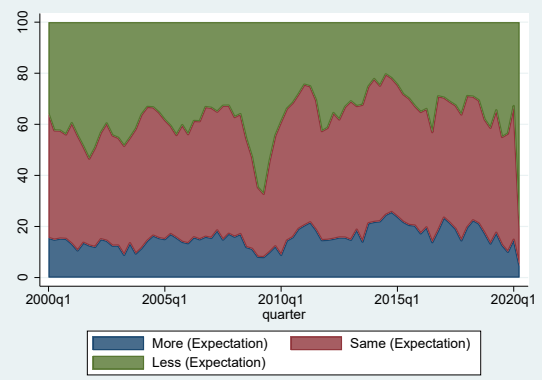


(c) Expectation and Realisation of Output (Down)

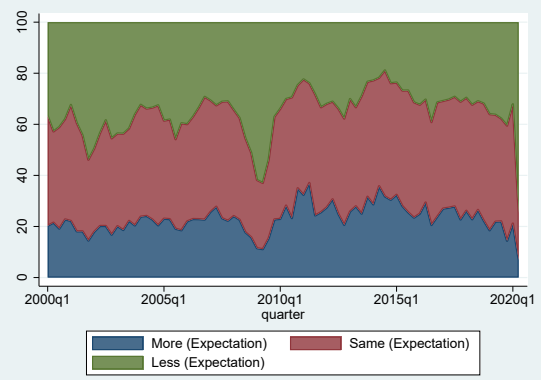


(d) Factors Limiting Future Output

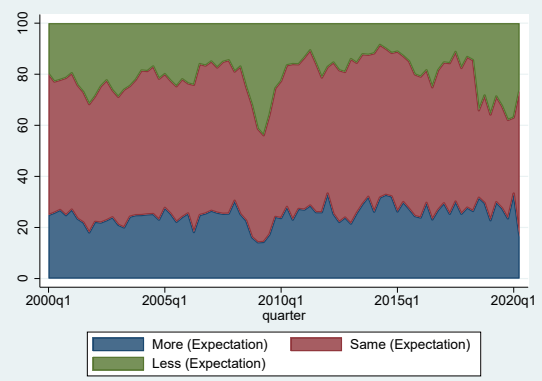
Figure 4: ITS: Questions Related to Investment



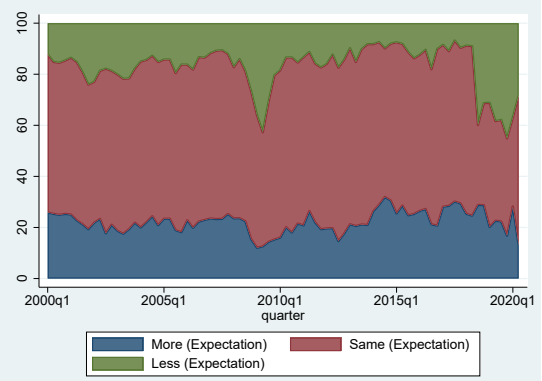
(a) Land and Buildings



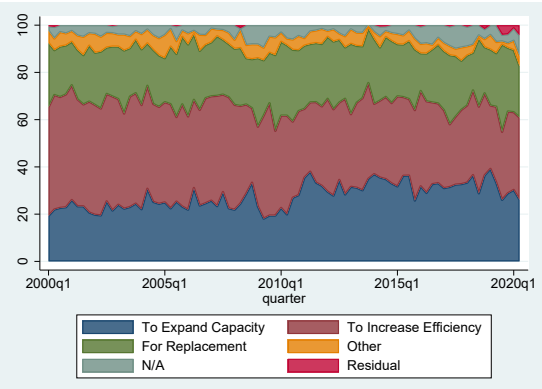
(b) Plant and Machinery



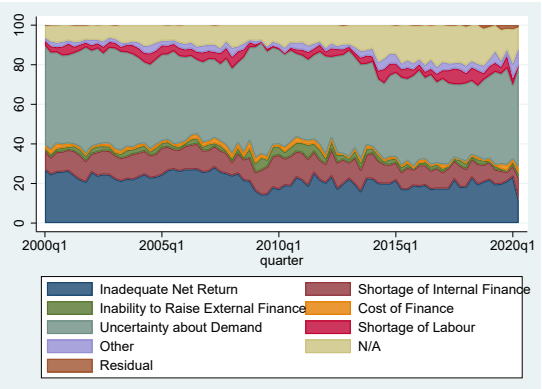
(c) Product and Process Innovation



(d) Training and Retraining

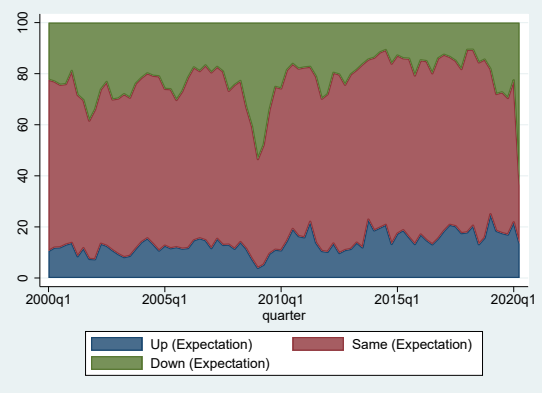


(e) Factors Encouraging Investment

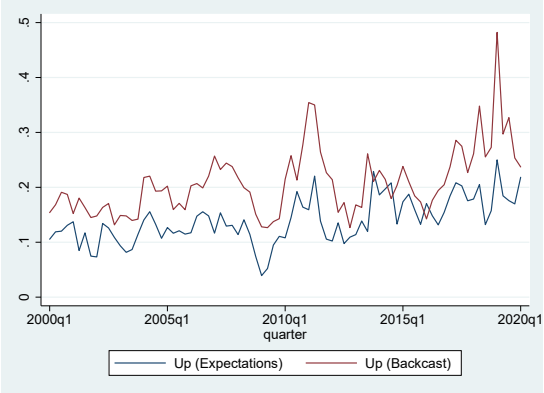


(f) Factors Limiting Investment

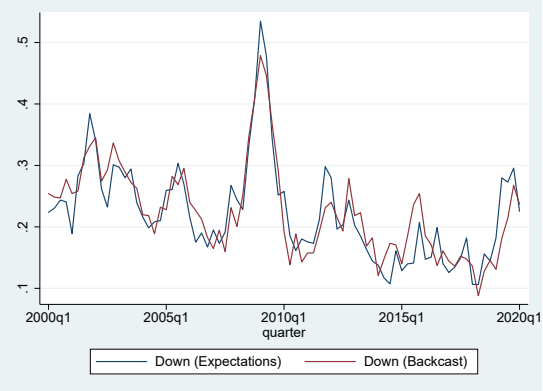
Figure 5: ITS: Questions Related to Inventories



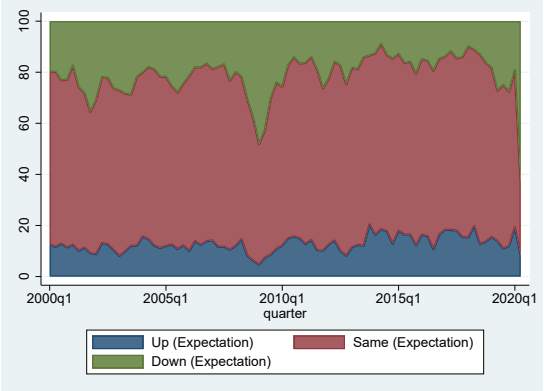
(a) Raw Materials and Bought-in-Supplies



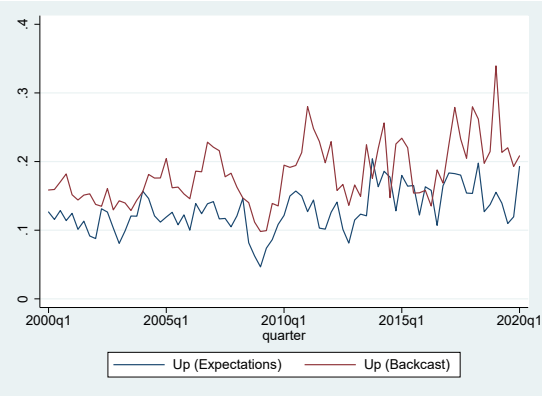
(b) Expectation and Realisation of Raw Materials and Bought-in-Supplies (Up)



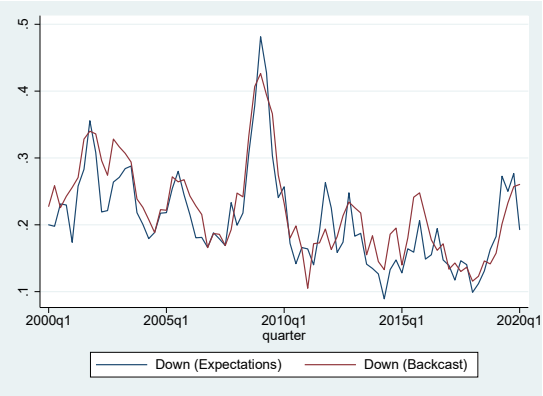
(c) Expectation and Realisation of Raw Materials and Bought-in-Supplies (Down)



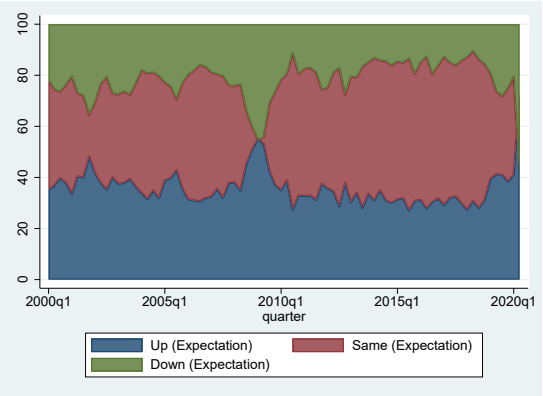
(d) Work in Progress



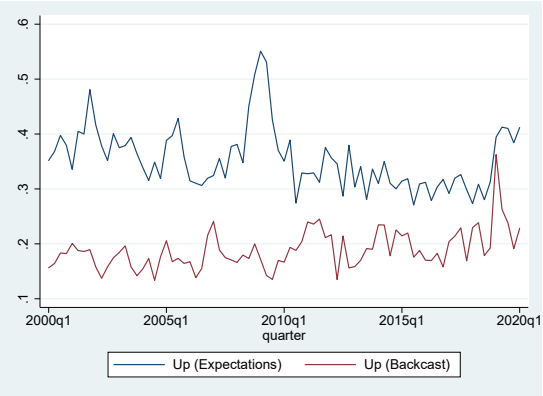
(e) Expectation and Realisation of Work in Progress (Up)



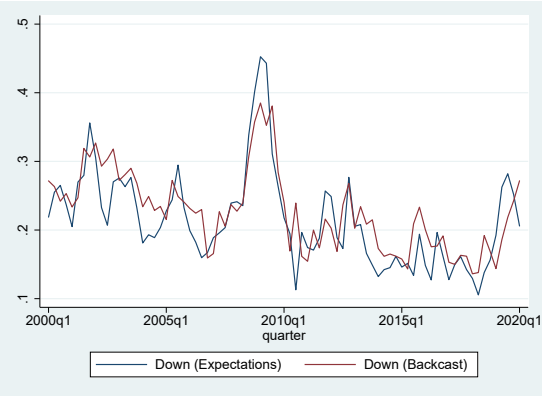
(f) Expectation and Realisation of Work in Progress (Down)



(g) Finished Goods

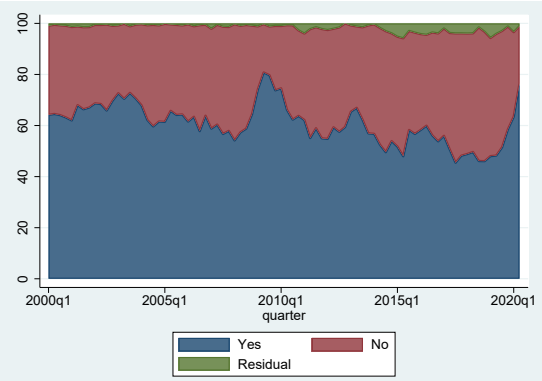


(h) Expectation and Realisation Finished Goods (Up)

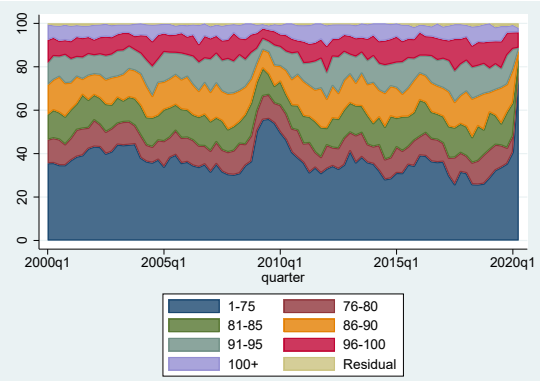


(i) Expectation and Realisation Finished Goods (Down)

Figure 6: ITS: Questions Related to Capacity

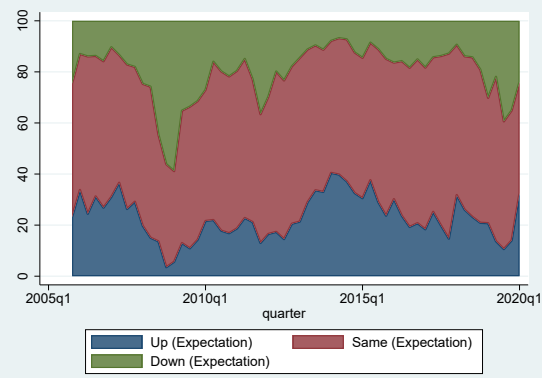


(a) Is the Present Level of Output Below Capacity?

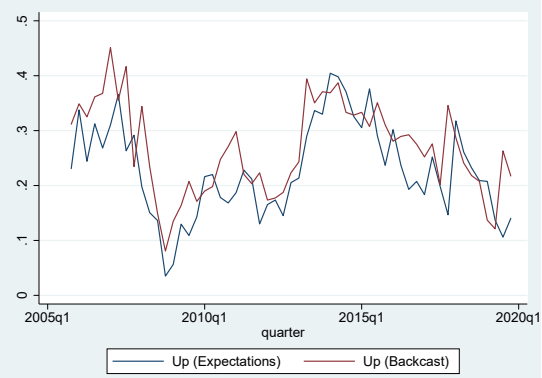


(b) Current Rate of Operation as a Percentage of Full Capacity

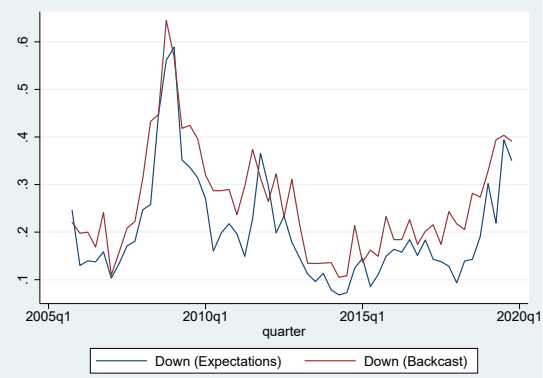
Figure 7: SSS: Questions Related to Output



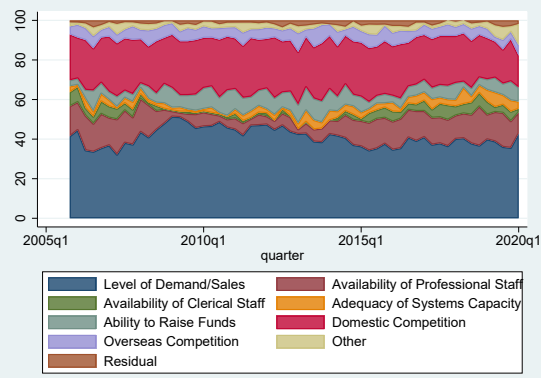
(a) Proportion of Firms Responding Up, Same, Down



(b) Expectation and Realisation of Output (Up)

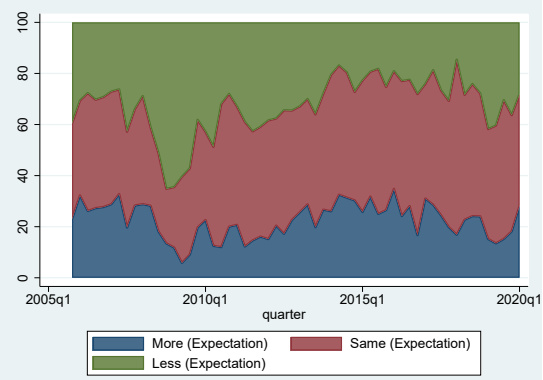


(c) Expectation and Realisation of Output (Down)

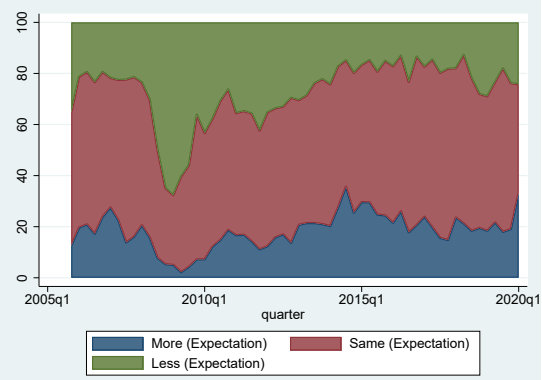


(d) Factors Limiting Future Output

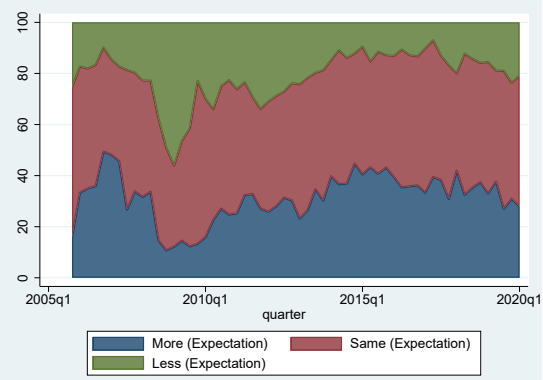
Figure 8: SSS: Questions Related to Investment



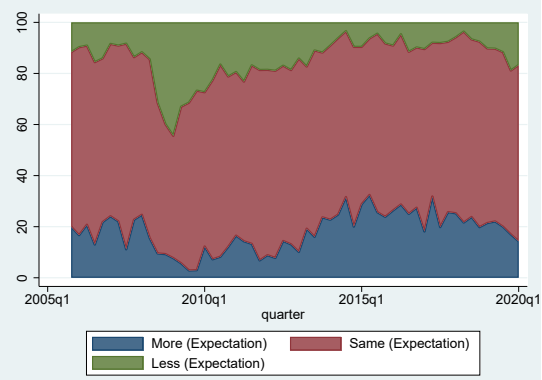
(a) Land and Buildings



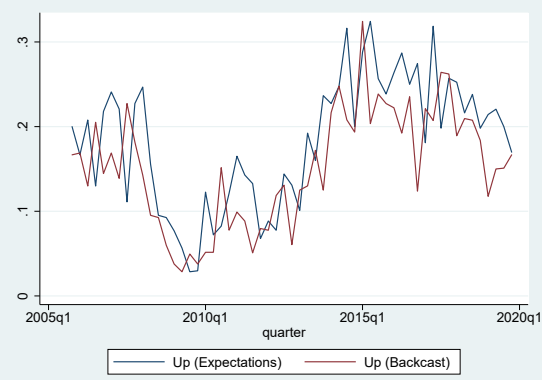
(b) Vehicles, Plant and Machinery



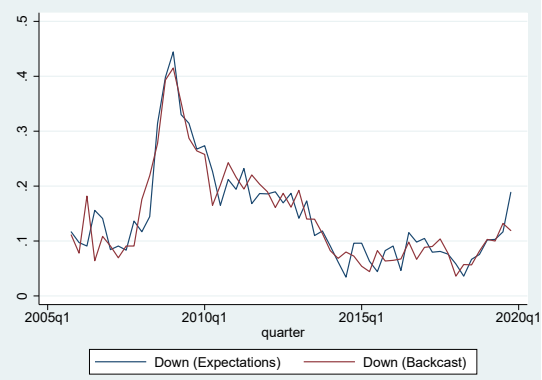
(c) Information Technology



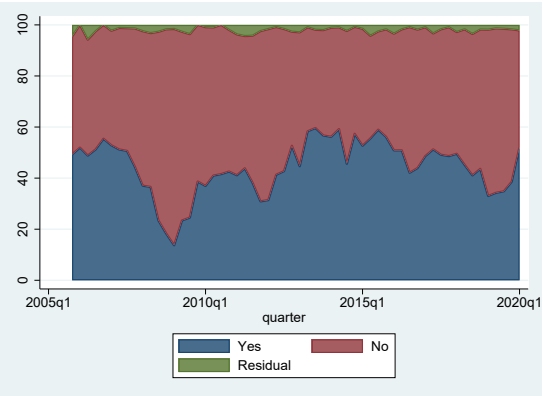
(d) Training and Retraining



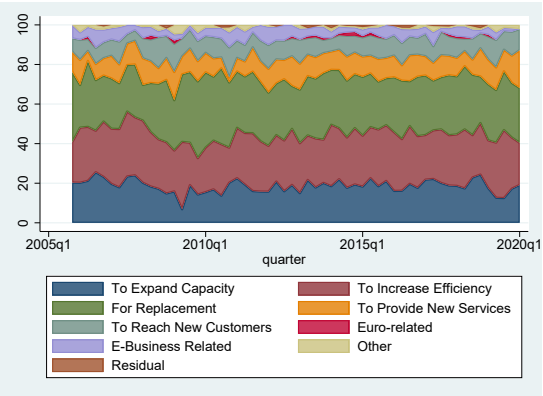
(e) Expected and Realised Capital Expenditure on Training and Retraining (More)



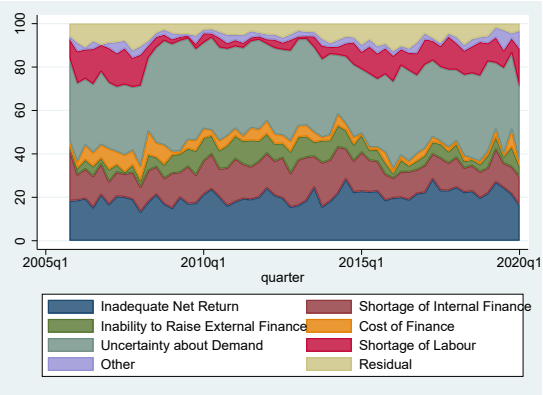
(f) Expected and Realised Capital Expenditure on Training and Retraining (Less)



(g) Expansion Intentions

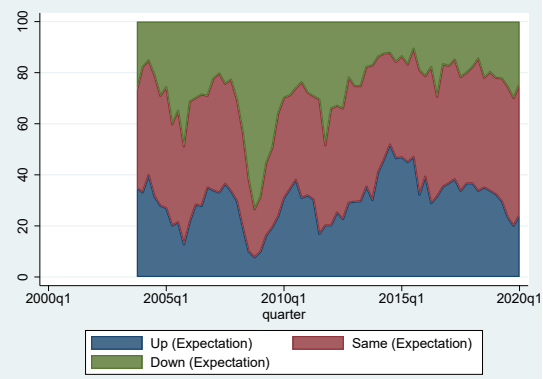


(h) Factors Encouraging Investment

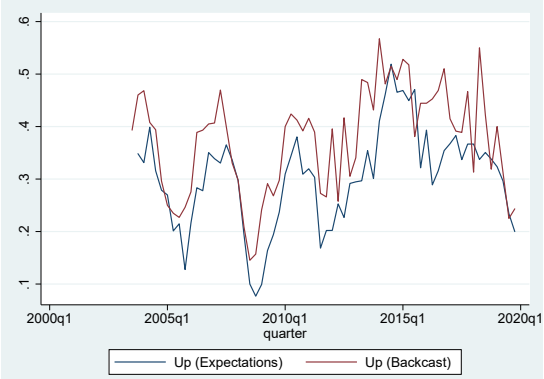


(i) Factors Limiting Investment

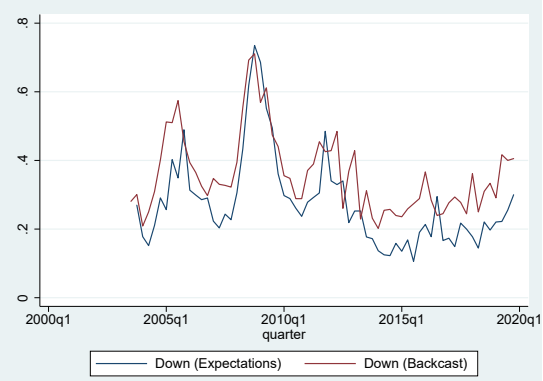
Figure 9: DTS: Survey Responses



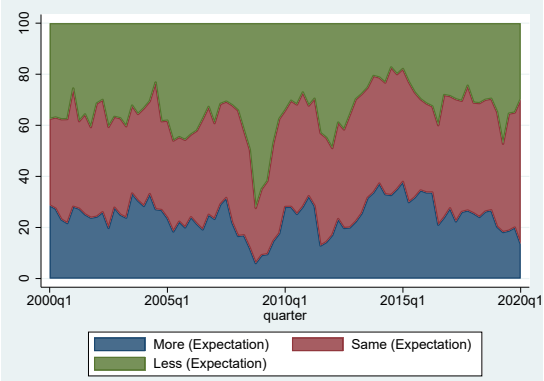
(a) Proportion of Firms Responding Up, Same, Down (Output Expectations)



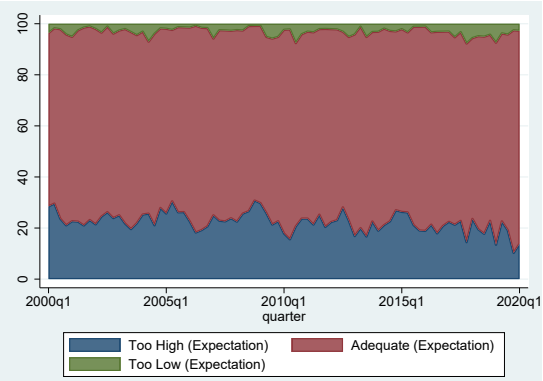
(b) Expectation and Realisation of Output (Up)



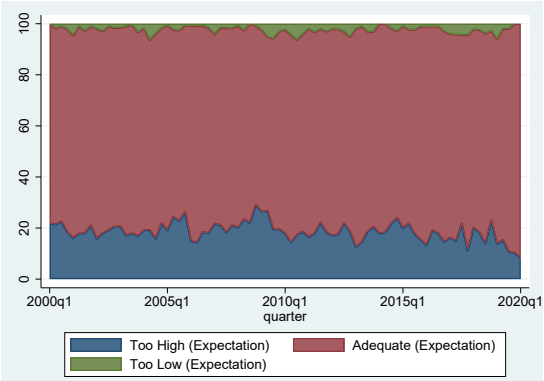
(c) Expectation and Realisation of Output (Down)



(d) Investment Intentions

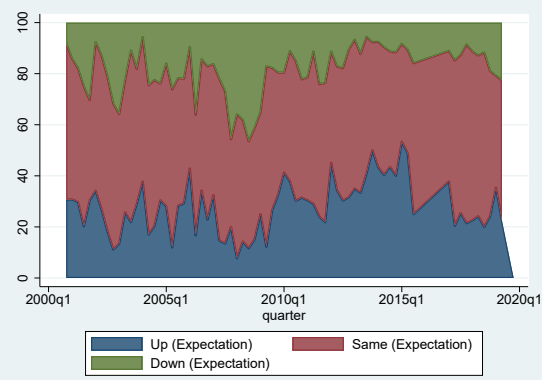


(e) Volume of Stocks (Current Month)

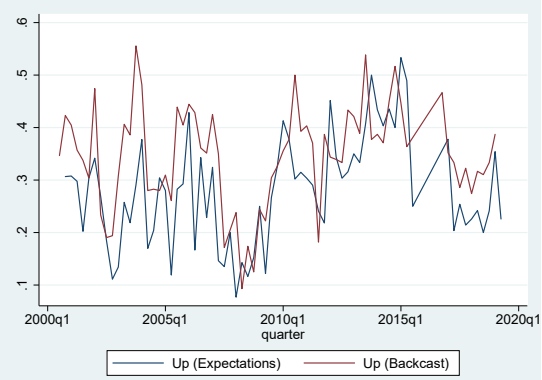


(f) Volume of Stocks (Next Month)

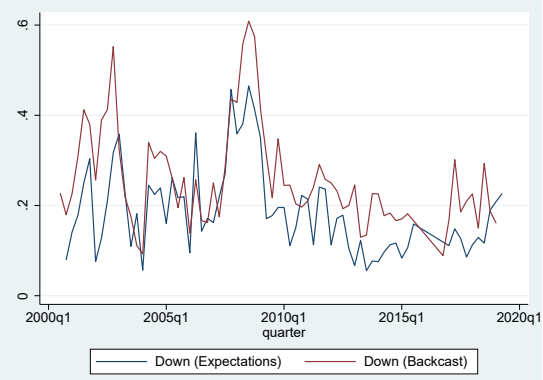
Figure 10: FSS: Questions Related to Output



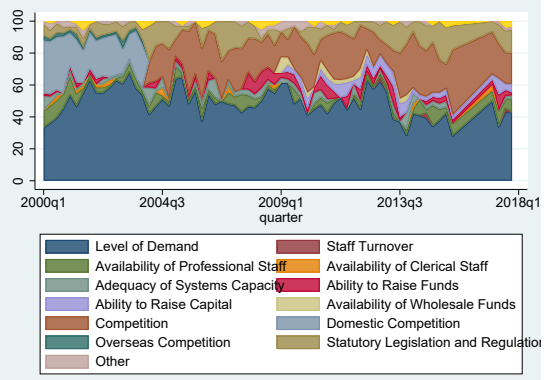
(a) Proportion of Firms Responding Up, Same, Down



(b) Expectation and Realisation of Output (Up)

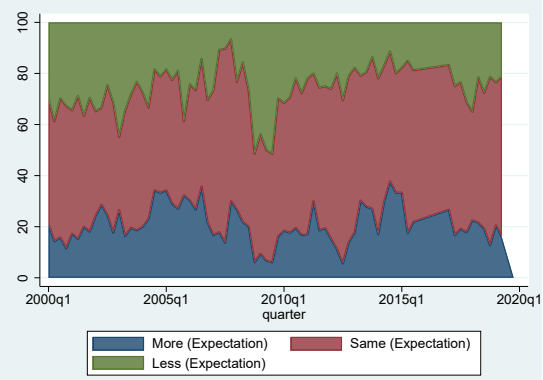


(c) Expectation and Realisation of Output (Down)

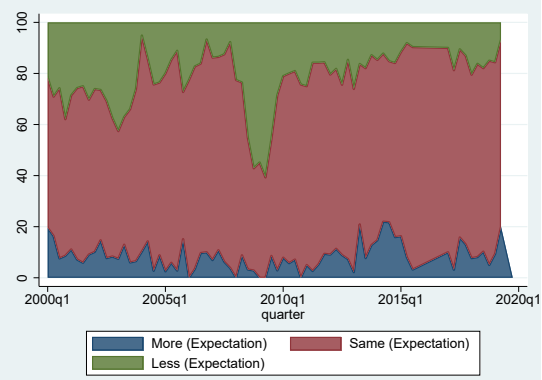


(d) Factors Limiting Future Output

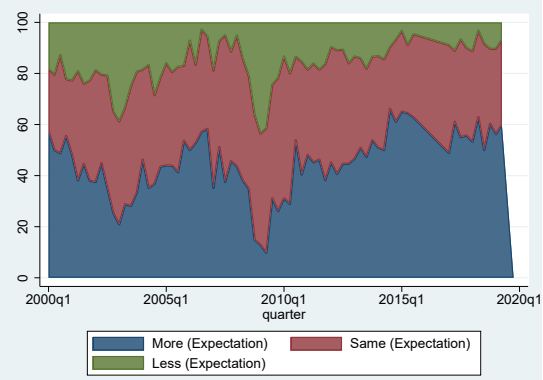
Figure 11: FSS: Questions Related to Investment



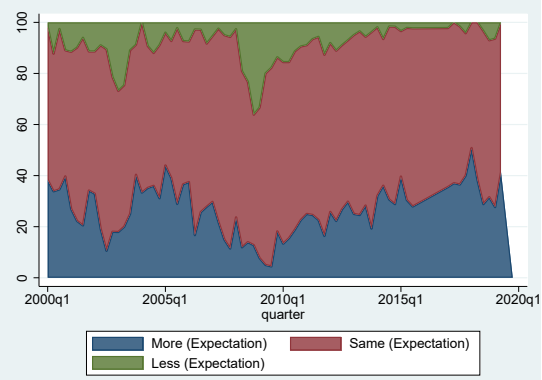
(a) Land and Buildings



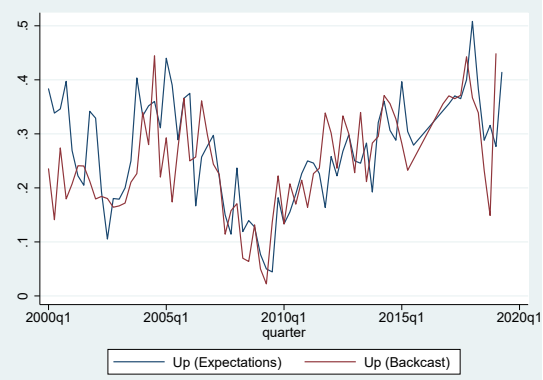
(b) Vehicles, Plant and Machinery



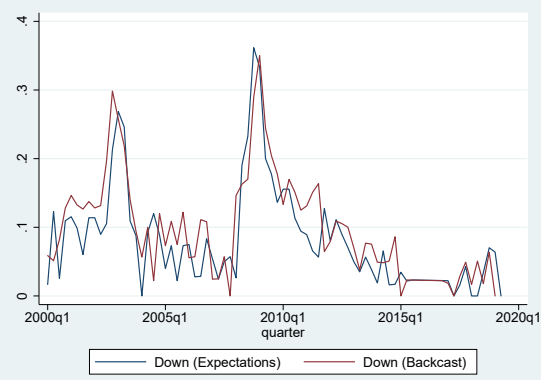
(c) Information Technology



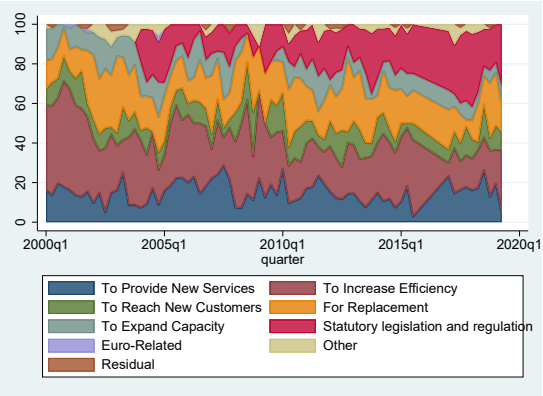
(d) Training and Retraining



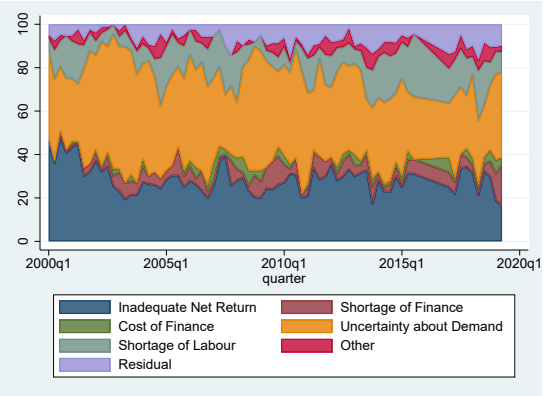
(e) Expected and Realised Capital Expenditure on Training and Retraining (More)



(f) Expected and Realised Capital Expenditure on Training and Retraining (Less)



(g) Factors Encouraging Investment



(h) Factors Limiting Investment