
The Bank's use of survey data

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The Monetary Policy Committee (MPC) has access to around thirty 'state-of-trade' surveys, containing hundreds of different pieces of information. This article provides a brief outline of how surveys are used to inform the MPC's economic assessment and policy decisions, describing the techniques employed to compare surveys with official data, and to extract the 'news' from surveys.

Introduction

The Bank of England's Monetary Policy Committee (MPC) is charged with the task of achieving the Government's inflation target. A central part of this task involves interpreting information about the current state of the UK economy, and assessing its medium-term prospects. Surveys form part of the broad range of information available to the MPC, along with official statistics, data from financial markets, and the information provided by the Bank's regional Agencies. In this sense, surveys complement other sources of information. But importantly, the forward-looking nature of many survey responses means that they often provide information that is additional to official and other sources of data.

Surveys are numerous and varied, so it is important to use the information as systematically as possible, to ensure a consistent approach to identifying the important news in survey information and to avoid 'cherry-picking' survey results. This article explains how survey information has been used at the Bank in the past few years; it follows an earlier *Bulletin* article on the quantification of survey data (see Cunningham (1997)),⁽¹⁾ and parallels work that has been done elsewhere.⁽²⁾ The first section discusses the nature of survey information; the second explains how survey information is used at the Bank: how survey information is transformed into quantitative estimates and how the 'news' in surveys can be identified. The third section offers some conclusions about the use of survey information for monetary policy.

The nature of survey information

In this article, the term 'surveys' refers mainly to state-of-trade type surveys, such as the CBI Industrial Trends survey or the Federation of Recruitment and Employment Services (FRES) survey.⁽³⁾ Strictly speaking,

most official statistical series published by the Office for National Statistics (ONS) are also surveys insofar as they are based on samples of firms, households or individuals, rather than a full census. But ONS data are normally quantitative—for example, sales in company A were £100 million in a particular period. State-of-trade surveys are normally qualitative—for example, sales in company B were above normal in a particular period, or were higher than in a previous period.

State-of-trade surveys typically provide responses from companies (or individuals) to a range of questions relating to current business (or household) conditions: for example, questions on output, orders, employment, optimism, cash flow, investment and prices. The Bank, like others, is usually interested in how survey responses change over time,⁽⁴⁾ what light they might shed on key aspects of economic behaviour, and how they inform its understanding of economic conditions. Survey responses can be divided into two broad groups: first, those that have direct parallels in official statistical series (eg on output, exports and employment); and second, those that complement other sources of information (eg on orders, skill shortages, capacity utilisation, and expectations about prices, employment or output in the near future).

Survey responses that correspond directly with official data may be useful if they are available on a more timely basis, or as a cross-check on ONS estimates (which necessarily tend to be revised over time as more information becomes available). Survey responses that give mainly additional information may be useful if they can capture or act as proxies for something that is either not well measured statistically, or is not directly observable (eg confidence, capacity utilisation or skill shortages). In both cases, survey responses may also provide forward-looking information. For example, responses about current order-books may contain information about future output, and responses about

(1) See Cunningham, A (1997), 'Quantifying survey data', *Quarterly Bulletin*, Vol 37(3), pages 292–300, which discusses estimation problems associated with serial correlation.

(2) See Sentance, A and Robson, P (1997), 'Interpreting the CBI Industrial Trends Survey', Centre for Economic Forecasting, London Business School, *Discussion Paper No 31–97*, December.

(3) Other surveys include those by the British Chambers of Commerce (BCC) and the Chartered Institute of Purchasing and Supply (CIPS).

(4) Of course, companies may change the way they answer questions over time, so long-run comparisons of survey responses will need, as far as possible, to take such changes into account. See '40 years on: how do companies respond to the CBI's Industrial Trends survey?', *CBI Economic Situation Report*, November 1998, pages 16–21.

investment intentions may be indicative of future capital expenditure.

The Bank has regular access to more than 30 state-of-trade surveys, providing hundreds of pieces of information. The Bank's use of this information varies, according to the timeliness, track-record and coverage of the survey. The main focus is on surveys with a broad sectoral coverage, such as manufacturing and services, though surveys covering sectors such as engineering, distribution and financial services are also regularly considered. Other surveys cover particular economic groupings, such as small and medium-sized enterprises. Surveys of labour market behaviour also have an important role, supplementing official data on employment and recruitment trends, and providing insights on the prevalence of skill shortages. Surveys with a long track-record, such as the CBI Industrial Trends survey, may be useful in assessing and analysing the cyclical position of the economy.

Using and quantifying the information in surveys

Surveys sometimes provide direct numerical estimates of variables. For example, the British Retail Consortium's (BRC) survey provides a direct estimate of annual growth in retail sales values based on data provided by BRC members. This is published a few weeks ahead of the ONS retail sales release.

Sometimes, surveys provide numerical estimates for which there is no official data counterpart; for example, various surveys of inflation expectations (such as the Barclays Basix survey) ask respondents for their expectations of annual retail price inflation over specific periods. These supplement inflation expectations measures derived from the yield curve in two ways. First, the survey expectations typically cover short horizons (one to two years); the market-based inflation term structure implied by the yield curve is not well defined at these maturities. Second, whereas the inflation term structure only captures the expectations of financial market participants, the surveys capture the expectations of a broader range of groups, including the general public and trade unions.

The Bank also uses survey-based inflation expectations to derive various measures of short-term real interest rates. In addition, some survey-based expectations are available at medium-term horizons. These can provide information on monetary policy credibility. In conjunction with the inflation term structure data, they may also provide an indication of the size of the inflation risk premium.

More typically, survey information has to be manipulated in some way, either to be compared with its official data counterparts or to undertake other kinds of data analysis. Three general approaches are described below. The first two approaches try to match qualitative survey information with quantitative official data. However, as with any economic

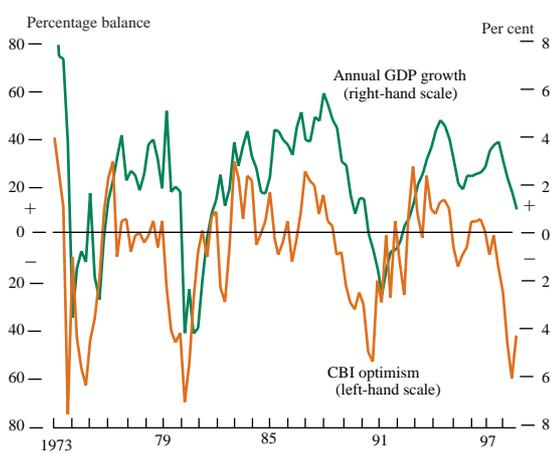
data, the 'news' (ie the additional information) in survey responses needs to be identified. The third approach describes how this can be addressed.

(i) Observing the data

A typical approach to interpreting survey information is to observe a time series of a balance statistic (for example, the difference between the proportion of firms reporting a rise in optimism and those reporting a fall), and try to assess the significance of recent changes. Large movements in a series that normally changes by small degrees clearly warrant closer examination, by comparing the latest observation with, for example, the average over time or, where possible, similar points in previous cycles. A further consideration might be whether a pattern or recent trend in the survey is comparable with other data. If so, a change in the direction of survey responses, for example from rising to falling balances, may be indicative of a turning-point in the related series. We might then ask how this observation squares with the broader economic picture and, in particular, with the MPC's current assessment and projections.

Chart 1 shows the business optimism balance from the quarterly CBI Industrial Trends survey and the annual growth in GDP. There is a much-publicised relationship between them, which became a focus of media and financial market attention in 1998 after the balance of manufacturing firms reporting lower optimism about future prospects increased sharply. Other surveys covering the manufacturing sector—such as the BCC survey—conveyed a similar message.

Chart 1
CBI optimism and annual GDP growth



Based on the previous observed relationship between the CBI series and GDP growth, the deterioration in survey balances in autumn 1998 could have been consistent with a sharp fall in GDP growth some time thereafter. But the relationship appears to have been weaker since the mid 1990s, which prompted the question of how large a fall in GDP growth the confidence indicator should lead us to expect. And was confidence in the manufacturing sector likely to be typical of the wider economy at this particular time?

Responses to a survey covering the manufacturing sector were expected to show business optimism deteriorating more than confidence across the economy as a whole, given the probable effect of sterling's appreciation in 1996–97 and the impact of the crises in East Asia and other regions in 1997–98 on manufacturing firms. So there were plausible reasons why manufacturers' optimism might prove less indicative of total GDP than in the past. This reasoning, though intuitively appealing, inevitably involved uncertainty. In its November *Inflation Report* forecast, the MPC's central projection was for annual GDP growth to fall quite sharply over the forthcoming year, though not to become negative. However, the risks to the projection were skewed downwards, ie it was considered more likely that GDP growth would be below than above the central projection. This projection reflected the MPC's best assessment of all the information available to it, including survey information.

(ii) Matching survey information with official data

To make the best use of qualitative survey data, they need to be converted into quantitative estimates of comparable official data, for example correlating output or orders responses with official measures of output. This is often done by estimating regression equations of survey data against official data. It is better to use 'up' and 'down' survey responses, if available, rather than survey balances in such regressions, because of the potential bias and inefficiency of the estimation process.⁽¹⁾ These simple bivariate regressions generate survey-based estimates of growth rates of official series such as manufacturing output, export volumes, retail sales, investment and employment. The estimates make it possible to gauge systematically the significance of a change in survey responses, and to compare them directly with the official data.

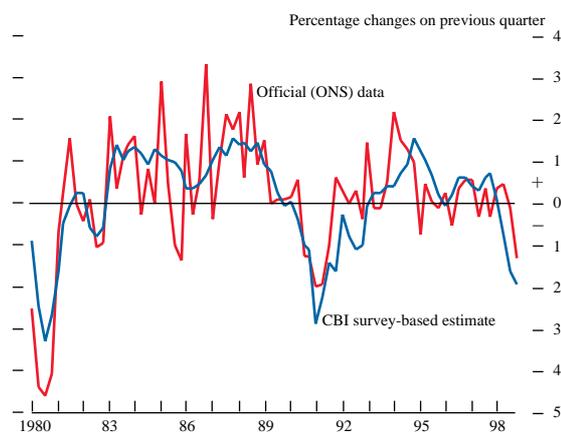
Backward-looking survey-based estimates of official data

The simplest use of the data-matching technique is where survey data are backward-looking (for example, reporting output over the most recent three or four months), and clearly comparable official data are available. A simple illustrative regression for this kind of data-matching is shown below:

$$\text{Output growth}_t = \alpha + \beta_1 \text{UPS}_t + \beta_2 \text{DOWNS}_t + \varepsilon_t$$

Chart 2 plots a survey-based estimate of manufacturing output alongside ONS data. As Cunningham (1997) observed, these derived estimates tend to follow a smoother path than the actual ONS data, and so the regression equations have large standard errors. But they allow us to map a piece of survey information onto a quantitative estimate of a related variable. For example, we are able to say that a balance of n firms reporting higher output is consistent with growth of $x\%$. This can help us to determine whether, for example, a fall (rise) in the balance (or the 'up' or 'down' responses) suggests a sharp or

Chart 2
Manufacturing output: official data and survey-based estimate



moderate slowdown (upturn) in output. We may, of course, be interested in apparent discrepancies between official and survey data: for example, the weakness in official manufacturing output data in 1995 contrasted with stronger survey information.

Survey-based estimates, however approximate, are a useful tool, allowing survey information to inform and contribute to the MPC's economic assessment and policy decisions, in a way that is consistent with other economic data. This may be particularly valuable at economic turning-points, when there may be conflicting signals about the economic conjuncture.

Forward-looking estimates of official data: sectoral output and GDP estimates

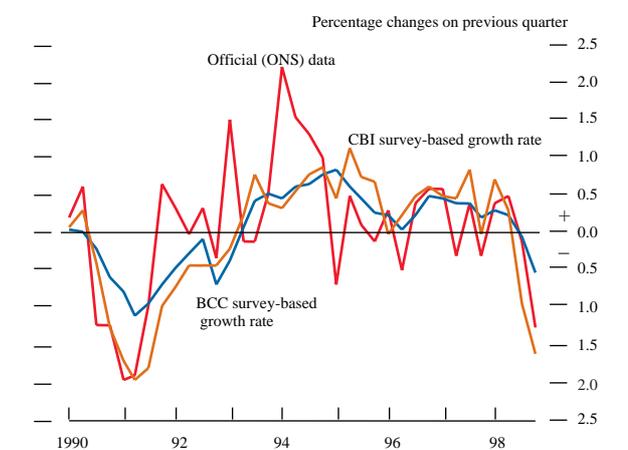
As some official data are likely to be available for the immediate or recent period, in practice we tend to be more interested in forward-looking survey data. This may, of course, only be duplicating other forward-looking information, and contain little news in addition to the information captured in existing data and the relationships embodied in the MPC's projections (ie forward-looking survey information may simply be confirming aspects of existing MPC projections). But given the uncertainties surrounding economic forecasts, forward-looking survey information is likely to be valuable as a timely and independent cross-check on other information.

The same matching techniques can be applied to forward-looking information that has some form of leading relationship with, for example, output (such as domestic and export orders), or with firms' or individuals' expectations about, say, future output or investment. Chart 3 plots an estimate of manufacturing output derived from CBI domestic orders balances. This transformation allows us to generate an estimate of manufacturing output for, say, the quarter ahead, consistent with the survey information, that

(1) See Cunningham (1997), *op cit*.

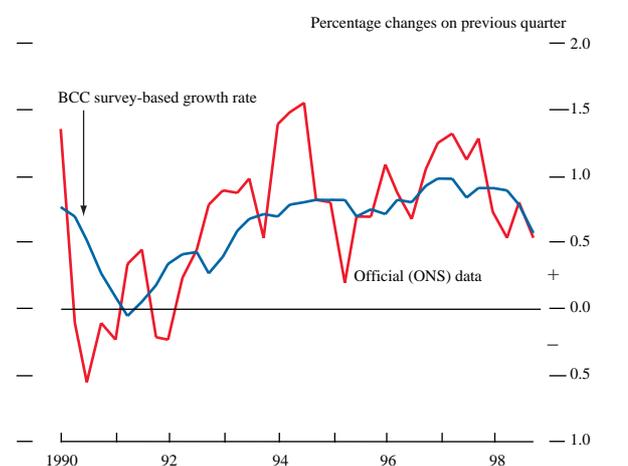
can be compared with estimates based on other surveys, such as the BCC survey (shown in Chart 3).⁽¹⁾

Chart 3
Survey-based estimates of manufacturing output:
CBI and BCC domestic orders



Similarly derived estimates are produced for output in other sectors. Survey data with a long track-record covering the service sector are less common. The BCC survey is used to generate forward estimates of services output. Chart 4 shows an estimate of services output derived from the BCC home orders balance.

Chart 4
Survey-based estimates of service sector output:
BCC home orders



It is possible to weight the survey-based sectoral output estimates together to generate a survey-based estimate of GDP. It is not possible to capture all sectors of the economy, but established surveys for the manufacturing, construction and private services sectors collectively account for around three quarters of GDP. This allows us to present an estimate of GDP growth that is consistent with a range of current survey information. We may wish to incorporate other subsequently available information to generate a more accurate projection of output growth (for example, the

monthly index of production and retail sales data) to compare with existing MPC projections. But the absence of monthly service sector output indices means that survey data remain an important indicator for a large part of the economy until GDP estimates are published.

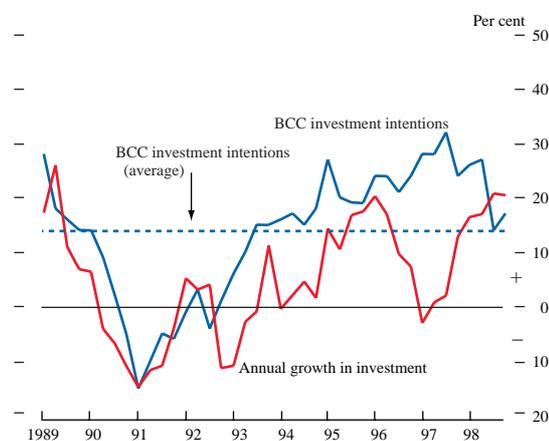
These survey-based estimates of output growth, based on orders responses, can be produced ahead of official ONS estimates, depending on what lags are employed when using forward-looking information. This can help the MPC to assess its projections (and balance of risks). Recently, it has been possible to say approximately whether or not survey information on orders pointed to a sharper slowdown in GDP growth than incorporated in the MPC's inflation forecast. Using the CBI survey resulted in a sharper projected decline in manufacturing output than that derived from the BCC survey. So it was necessary to judge how much weight to place on each of the surveys.

This use of survey information is not the only way to generate estimates of current or next-quarter GDP to supplement model-based forecasts. Another example is the approach adopted by the National Institute of Economic and Social Research (NIESR). The NIESR estimates use available and extrapolated values of official data, such as the index of production and retail sales.⁽²⁾ The NIESR does not use any independent survey information.

Forward-looking survey-based forecasts of official data: investment intentions and investment

Some surveys ask questions not only about the next month or quarter, but also about the following year. The data-matching techniques described above can be modified to use this information to construct a survey-derived forecast of official data up to the relevant horizon. This has been done at the Bank for investment and investment intentions (see Charts 5 and 6). The survey questions on investment intentions tend to ask firms what their plans are for investment over the next twelve months, compared with the most recent twelve months. Responses to these questions

Chart 5
Service sector investment in plant and machinery

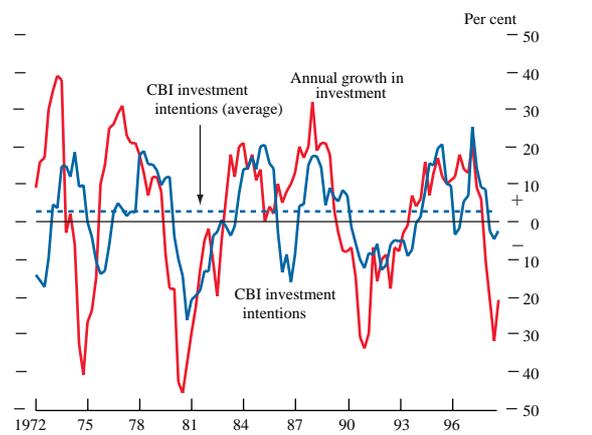


(1) Combining different surveys or series from the same survey does not greatly improve these estimates. In any case, the purpose here is not to model manufacturing output or other series using surveys, but to transform survey information.

(2) See Salazar, E, Smith, R, Weale, M and Wright, S (1997), 'A monthly indicator of GDP', *NIESR Review*, July.

can be used to generate forecasts for investment at all horizons between one quarter and four quarters ahead.

Chart 6
Manufacturing investment in plant and machinery



(iii) Identifying news in surveys

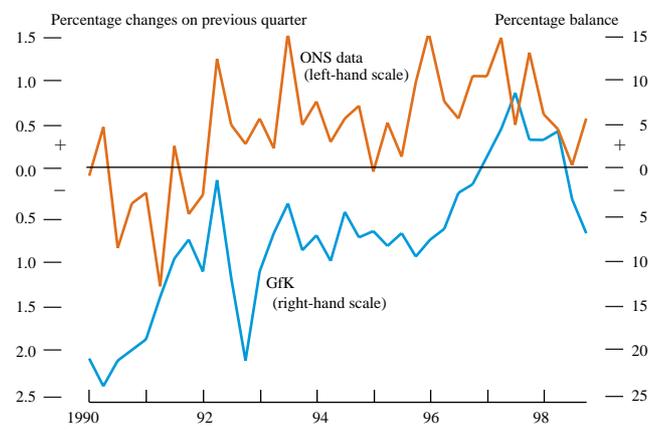
Even when survey information is forward-looking or more timely than official data, data-matching techniques do not identify the news in survey information relative to other data available at the time of its publication. They do not answer the question of how much of the fall in confidence, for example, was already captured in other known data. Work at the Bank has assessed how far survey data provide information not available elsewhere. For example, consumer confidence indicators can be thought of as summary statistics of the factors influencing household spending (and saving), such as income, wealth and employment prospects, which will be embodied in consumption forecast equations. Only some of these factors are observed and measured in other data series. So an important consideration in interpreting confidence indicators is whether changes in confidence reflect known factors, or contain extra information. The same is true of business optimism, which can be thought of as a summary statistic of the factors influencing business investment, as well as reflecting broader considerations such as demand conditions. Examples of both of these are set out below.

Consumer confidence and consumption

There are two main surveys of consumer confidence in the United Kingdom, conducted by GfK and MORI. The GfK survey asks individuals about their perceptions of the general economic situation and their own finances and spending plans, both over the past year and for the year ahead. The MORI survey asks a single question about perceptions of the general economic situation. Confidence indicators are published monthly, and are available ahead of the quarterly national accounts estimates of household spending. They are also published ahead of monthly official retail sales estimates. There is a reasonably good correlation between the level of consumer confidence (as measured by

the GfK index) and ONS estimates of household spending growth (see Chart 7). So consumer confidence indicators might be useful as proxies for currently unobserved household spending.

Chart 7
GfK consumer confidence and quarterly household spending growth



Consumer confidence indicators may also contain information not directly measured in official data, particularly on individuals' expectations about their income. Theory suggests that the level of current consumption depends on individuals' expectations about their future labour income ('human wealth'), as well as their current labour income and non-human wealth, such as housing and financial wealth. The GfK survey asks individuals each month whether they are more or less optimistic about their finances over the year ahead. Since income from employment is the most important component of the income of most households, it is likely that changes in optimism about finances largely reflect perceptions about future labour income. Bank research has found that consumer confidence measures have explanatory power for household spending over and above official estimates of income, wealth and real interest rates, which is consistent with the role of consumer confidence as a proxy for income expectations. This analysis was used in 1998 to assess the risk of a sharper slowdown in household spending growth than was incorporated in the central *Inflation Report* projection.

This use of confidence indicators requires judgment. There is no mechanistic mapping from changes in consumer confidence to the MPC's central projection or assessment of risks surrounding the forecast of household spending. In the above example, there was a clear puzzle about weaker-than-expected official estimates of household spending growth in 1998 (beyond what was explained by erratic factors). This prompted a search for explanations of why consumer spending had been weaker than expected. The fall in consumer confidence was one of a number of potential explanations considered by the MPC.⁽¹⁾

(1) MPC minutes, November 1998, published in the February 1999 *Inflation Report*.

Business optimism and investment

The corporate sector counterpart to consumer confidence is business optimism. A number of surveys ask firms how optimistic they are about the state of the economy. As noted in the first section, business optimism responses from the quarterly CBI Industrial Trends survey have in the past been closely correlated with GDP growth. Business optimism is likely to reflect all the factors that influence the particular sector of the economy that the survey covers. But current business optimism might also contain ‘news’ specifically for current and future investment, just as consumer confidence contains news for consumption. Some analysis has recently been undertaken at the Bank to determine whether measures of business optimism do indeed contain news for current or future investment, relative to other known information.

In particular, news in the CBI business optimism balance can be identified by regressing the optimism balance on its own lag and a set of other variables, including those on the right-hand side of an econometric equation for business investment (for example, GDP and the real cost of capital). The residual from this regression can be thought of as the news in business optimism. This news can then be shown to have significant incremental explanatory power in the equation for business investment. Indeed, because the optimism balance reflects firms’ expectations, the news in optimism is significant for investment up to three quarters ahead.

The results of regressions of this sort reveal the average news for investment contained in the optimism balance, reflecting all shocks to the economy over the sample period. There may be—and in this case there clearly are—reasons for thinking that, given recent shocks, this average does not provide an accurate way of quantifying the news for investment in the current optimism figures. First, the CBI survey covers only manufacturing firms, and manufacturing investment has progressively become a smaller component of business investment, accounting for 19% of business investment during 1998, compared with 26% in 1986. Second, as argued above, the manufacturing sector is more vulnerable than other sectors to changes in the value of sterling, so the recent appreciation of sterling is likely to have had a disproportionately negative effect on the CBI

optimism balance, relative to business optimism across all sectors.

This analysis is reported in the Annex to the December 1998 MPC minutes.⁽¹⁾ The Annex also reports discussion of the relationship between investment intentions and the official data on investment, mentioned above. The survey evidence on investment overall was mixed. The news in the business optimism indicators, taken at face value, pointed to very weak prospects for investment. But survey evidence on investment intentions, for services as well as manufacturing, pointed to a stronger picture. Taken together, the survey information suggested that underlying business investment would remain broadly unchanged after the third quarter of 1998.

Conclusions: surveys and monetary policy

This article has outlined how Bank staff use state-of-trade type surveys: as a timely indicator of forthcoming official data; as an independent cross-check on official data and other information; as forward-looking information on the economy, particularly up to the short-term horizon; and to provide additional information to explain economic behaviour. It has discussed a variety of approaches the Bank uses to assess survey information, and to identify news about the economy. The article has outlined how simple observation can be useful, and has explained how qualitative survey information is transformed into quantitative estimates and how incremental news might be extracted from surveys. The approaches described illustrate how surveys help the MPC to interpret economic conditions, and resolve puzzles and uncertainties about the economic outlook.

Surveys complement official and other information; they are not a substitute for it. Many surveys are based on smaller, and less representative, samples than the official statistics. So they may be subject to bias, or to a higher degree of measurement error than the official data. The MPC has to form a judgment based on all available information, of which survey evidence is one valuable source. The techniques described above reflect the Bank’s aim to use this evidence as systematically as possible to inform the MPC’s policy decisions.

(1) Published in the February 1999 *Inflation Report*.