



Methods and Sources: Methodological Notes

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Survey on Inflation and Growth Expectations

General aspects

The Banca d'Italia survey of inflation and growth expectations has been conducted since 1999¹, interviewing Italian firms in industry excluding construction, non-financial private services² and construction (since 2013) with 50 or more workers. The survey is carried out by a specialist firm on a panel of about 1,000 firms that are interviewed on a quarterly basis in March, June, September and January.

The purpose of the survey is to obtain information on firms' expectations concerning inflation, the general economic situation, own-product prices and demand, investment and employment. Most of the data (with the exception of price and inflation expectations) are qualitative and relate to firms' opinions on changes in the real economy in the reference quarter and looking ahead. The qualitative questions in the questionnaire have three or more possible answers (for example: worse, the same, better). The answers to the qualitative questions are summarized by the balance between the number of favourable and unfavourable responses; neutral responses ('the same') are not used in calculating the balance.

The various methodologies used in the survey are described below.

The composition of sample and universe

The reference universe consists of firms in industry excluding construction, non-financial private services and construction with administrative headquarters in Italy and employing 50 or more workers. The response rate averaged about 50 per cent for industry and services and 40 per cent for construction. In recent years the sample has consisted of about 1,000 firms (about 400 in industry excluding construction, 400 in non-financial private services and 200 in construction). The list of firms used to extract the sample is drawn from the Bureau Van Dijk's Aida database and is updated on average every five years.

¹ The survey was conducted in collaboration with the newspaper Il Sole 24 Ore until the third quarter of 2018.

² The following are excluded from the survey: financial intermediaries and insurance companies, general government and the educational and healthcare sectors as well as other community, social and personal services.

The sample is stratified, the strata consisting of combinations of economic sector (based on the 2007 Ateco classification)³, firm size (number of workers) and geographical area (based on the firm's administrative headquarters), yielding the following categories:

Tab. 1

| Economic sector | Size of firm | Geographical area |
|---|-----------------------|--------------------------|
| Industry excluding construction (Ateco sections B, C D, E) | 50-199 workers | North-West |
| Non-financial private services (Ateco sections G, I, H, J, L, M, N) | 200-999 a workers | North-East |
| Construction (Ateco section F) | More than 999 workers | Centre |
| | | South and Islands |

The need to ensure a large enough sample for every type of firm considered relevant means that, in some cases, the number of companies selected is disproportionate to the share of that category in the entire population of firms. This is particularly true of large companies.

Data collection, questionnaire and response patterns

The survey is carried out in the first three weeks of March, June, September and December.

The specialist firm distributes the questionnaire to company managers. About 90 per cent of the data is collected through computer assisted web interviews (CAWI) in the form of an online questionnaire featuring a purpose-designed interface, while the remaining 10 per cent are collected through computer assisted telephone interviews (CATI).

The questionnaire is divided into six parts: general information, Italy's general economic situation, the economic conditions in which the firm operates, the firm's price dynamics, employment and investment. The survey gathers information on the opinions of firms on the general economy and on their own economic conditions, looking both backwards and forwards. Most of the questions are repeated throughout the various waves. On occasion, the survey contains questions on specific aspects of the economy that warrant further investigation.

Over the years the wording of the question on consumer price inflation expectations (for all time horizons) has differed. These different wordings are used in the same survey and are put to random subgroups of firms. However, the published and annotated estimates of inflation expectations are calculated based solely on the response of the group of firms to which the question containing the latest available data on consumer inflation (across all time horizons) was put. The wording of this question has remained largely unchanged since the start of the survey.

³ See Istat, *Metodi e Norme*, 40, 2009

Quality control and missing data

First, the collected data undergo a quality check to detect flawed data such as typing errors, outliers and missing data (non-response items). The checks also confirm the compatibility of the values entered in the questionnaire with those allowed by the question, the inter-temporal coherence of panel data, the presence of outliers and the verification of the numeric formats required for insertion. The first check is carried out by the respondent firms; the second check is performed through a computerized data entry procedure which prevents the entry of data that are outside the defined interval for the reported variables. Lastly, in order to limit the impact of any remaining outliers on the mean values for the main variables, the standard estimators are accompanied by robust estimators; specifically, values outside the range between the 5th and 95th percentiles are set at the threshold values of those percentiles (winsorization).

Using the correlation between the indicators obtained, the missing data are imputed by means of stochastic regression models, the parameters for which are set after neutralizing the outliers where appropriate. Currently, imputation is only available for expectations of inflation, own prices, and number of employees. The number of imputed values varies according to the indicator: imputed values represent between 8 and 9 per cent of the responses concerning inflation, between 12 and 15 per cent of those concerning own prices and about 5 per cent of those relating to the number of employees.

Weighting

The aggregates are evaluated using a weighting coefficient for each sample unit which, for each combination, sector and geographical area (stratum), takes into account the ratio between the number of respondent companies and the number of companies in the reference universe.

The survey is designed to include post-stratification (raking) based on the marginal distribution of the population by sector, geographic area and firm size.

For some indicators (e.g. the average change in firms' own prices) the weighting coefficient for the universe takes into account the number of employees in order to provide more accurate indications of expected macroeconomic developments.

The BIRD system

In March 2008, the Bank of Italy launched a system for the remote processing of data collected through its business surveys, referred to as the BIRD (Bank of Italy Remote Access to Micro Data) system. The system allows for the processing of data collected through the Survey on Inflation and Growth Expectations since 1999, fully maintaining the confidentiality of individual data. Users carry out their statistical and econometric analyses without having direct access to the micro data; they send an e-mail containing a program written in one of the prescribed languages and the system sends back an e-mail with the results of the calculations. Both the input and the output are subject to automatic and manual checks on the content and the logic of the processing. The use of the BIRD system is subject to the Bank of Italy accepting a request for the issue of a user license. In processing the results of this survey, the missing data in the variables relative to inflation expectations are attributable to the other wordings of the question, which are not included in the construction of the published and annotated estimates.