TRADE SURVEYS: QUALITATIVE AND QUANTITATIVE INDICATORS[1]

Maria Rita Ippoliti, Luigi Martone, Fabiana Sartor

1. Introduction

Qualitative business surveys on enterprises first appeared in the 1970s, within a harmonised project of the European Commission, in order to track the economic evolution and the short-term dynamics of the economic activity promptly.

The survey questionnaire asks enterprises to express their prospect of the business evolution and their evaluation, based upon opinion surveys about developments of business variables. Question types are mainly qualitative and closed-ended (i.e. "high", "low", "increasing", "decreasing", "steady", "above standard", "standard", "below standard").

Collecting these data allows measuring the economic evolution, by recording the different types of responses given by the interviewees over time (UNECE, 2015; European Commission, 2017).

Qualitative surveys are extremely relevant for the short-term economic analysis and exceptionally useful in the building process of cyclical indicators of the economic development as they gather information quickly and do not involve revisions.

This approach underlines the important role of assessments and expectations for the economic decision makers.

Each response is converted into a weighted balance, given by the difference between positive and negative responses, ignoring the neutral answers[2].

[1] Though the article is the result of a joint work, the single paragraphs are attributed as follows: paragraph 1 to Fabiana Sartor; paragraph 2 to Maria Rita Ippoliti; paragraph 3 to Luigi Martone. The published articles are exclusively expressing the authors' opinions; Istat shares no responsibility for the published contents.

[2] Weighted balances can vary from -100, when all the respondents choose the negative answer, to +100 when all the respondents choose the positive answer. Thus, qualitative series typically do not detect the long-term trend.

Weighted balances are used to calculate the business confidence indicators, using arithmetic means of variable sets, which are relevant for the short-term economic evolution of a specific economic sector[3].

As qualitative series are so important for policy makers, it is necessary to assess the reliability of results of the qualitative surveys, measuring the closeness with official quantitative series and estimating the similarity of signals coming from qualitative surveys and short-term movement in the economic activity (Koopmans, 1947; Zarnowitz, 1992). Therefore, qualitative variables are often considered to be complementary to official macroeconomic data and they are both used for analysing the short-term economic development (Bergstrom 1995; Bruno e Lupi, 2004; Croux *et al.* 2005; Claveria *et al.* 2007; Bruno, 2009; Cesaroni, 2011; Cesaroni *et. al.* 2011; Conti e Rondinelli, 2015; Girardi *et al.* 2016). Several studies have also documented the business cycle analysis through a qualitative approach (Altissimo *et al.* 2000; Bruno and Otranto 2008; McNabb and Taylor 2007; Cesaroni and Iezzi 2017; Bruno *et al.* 2019).

There has been much debate on this topic in the economic literature, mainly with regard to the manufacturing sector, while the discussion remained poor concerning the other economic sectors, such as services, trade and construction (Crosilla and Leproux, 2007; Crosilla *et al.* 2009; Martelli and Rocchetti, 2007).

This paper investigates the trade sector, comparing the evolution of business confidence in retail trade with two quantitative indicators, which measure the different sectors of section G: retail trade (Division 47) and turnover in services (Division 45) from 2010 until 2019. Business confidence in retail trade involves enterprises classified in the NACE Rev. 2[4] section G, apart from the wholesale trade classified in Division 46, the itinerant retailers classified in Group 47.8 and non-store retailers, stalls and markets classified in the 47.9.

The aim of the project is to assess the relation between qualitative and quantitative components concerning the retail trade sector: analysing the trend in time series and testing the forecasting ability of the qualitative index on quantitative data.

This paper is structured as follows: paragraph 1 presents the background to the study, it introduces and illustrates the qualitative and quantitative surveys involved. Paragraph 2 provides a description of methods and tools used, it presents a first graphic analysis comparing the quantitative and qualitative indicators and it introduces a new "ad hoc" indicator covering all sectors involved in the business confidence. Finally, paragraph 3 presents our conclusions and it shows that among

[3] See Moore and Shiskin (1967).

[4] Section G includes Division 45 (Wholesales trade, retail trade and maintenance of motor vehicles), Division 46 (Wholesales trade, except wholesales trade of motor vehicles) and Division 47 (Wholesales trade, except wholesales trade of motor vehicles).

the quantitative indices, the "ad hoc" index returns the highest correlation with its equivalent qualitative indicator.

1.1. Business Confidence Survey in Retail Trade

Business Confidence Survey in Retail Trade is part of a joint project harmonised at European level and coordinated by the European Commission[5]. It allows to have information on the economic evolution of retail trade (NACE Division G, except for Division 46 - Wholesale trade, except of motor vehicles and motorcycles and for Group 47.9 - Retail trade not in stores, stalls or markets including retail sales via mail order or via Internet).[6] The survey asks enterprises to express their opinions (judgements and expectations over the next 3 months) about the main economic variables (orders, prices, employment), giving therefore an updated overview on the evolution of the sector. Respondents are requested to state their consideration on their total sales in the last three months, on their current volume of stock and on prices charged by their suppliers. They are also invited to express how they expect the volume of orders, the employment, the prices they charge and total sales to change in the next three months. Information about enterprises of the Business Confidence Survey in Retail Trade are taken from a panel of approximately 1,000 commercial enterprises. The theoretical sample is stratified by enterprise employment size class (1-2 employees, 3-5; 6-999; at least 1,000 employees), by geographical area (North-West, North-East, Centre, South and the Islands) and by main activity (45.1 sales of motor vehicles; 45.2-45.4 maintenance of motor vehicles and sales of accessories; 47.1, 47.2 retail sales of food, drinks and tobacco; 47.3 retail sales of automotive fuel; 47.4-47.7 retail sales of other goods). The sampling scheme depends upon randomisation for enterprises with less than 1.000 employees and upon a census placement for all units with 1,000 employees and above. The data processing method sets out the estimate of the frequency percentages of each reply option relating to each question of the questionnaire. For this purpose, the processing of the micro data is based on a double weighting system: a) the frequencies of each reply option are firstly weighted using the number of employees declared by the enterprise at the time of the interview (internal weight); b) subsequently fixed weights reflecting the distribution of the added value of the reference sector (external

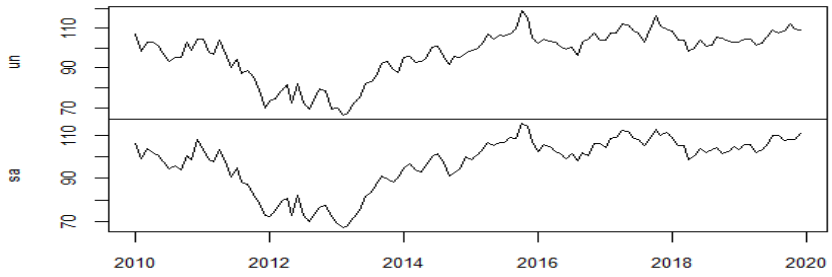
[5] European Commission. 2016. The Joint Harmonised EU Programme of Business and Consumer Surveys.

[6] Divisions of NACE Section G involved in the survey are Division 45 (Wholesale and retail trade and repair of motor vehicles and motorcycles) and Division 47 (Retail trade, except of motor vehicles and motorcycles).

weight) are used. Since March 2015, the aggregation procedure uses an external weighting structure derived from the added value at factor cost referred to 2012.

The index of business confidence in retail trade is calculated as the arithmetic mean of seasonally adjusted balances based upon opinions and expectations on sales and upon judgments on volume of stocks (the above-mentioned values have inverse signs). Weighted balances are equal to the difference between favourable and unfavourable responses given for each observed variable. Figure 1 shows the monthly evolution of the business confidence in retail trade, unadjusted and seasonally adjusted for years 2010-2019.[7].

Figure 1 – *Retail trade confidence (monthly, unadjusted and seasonally adjusted data, years 2010-2019).*



Source: Elaboration based on ISTAT data.

1.2. Retail Trade Survey

Monthly Retail Trade Survey collects data from enterprises that mainly operate in the retail trade sector (except for sale of motor vehicles and motorcycles and sale of automotive fuel). Therefore, the survey covers the retail sales sector only partially (NACE Rev. 2, G 47 - Retail trade, except of motor vehicles and motorcycles not including automotive fuel). Estimates of retail trade survey provide useful information on consumer spending.

Monthly indices on retail trade are released at national level, consistently with the European Union Regulations concerning short-term statistics (see European Regulations n. 1165/98 and n. 1158/2005)[8].

Retail trade data are collected from a sample of about 8,000 enterprises having at least a legal unit that operates in Italy. The sample is stratified considering the

[7] Seasonally adjusted data are available at http://dati.istat.it/en starting from January 2003.
[8] See https://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=CONSLEG:1998R1165:20120621:EN:PDF

following variables: main activity according to NACE Rev. 2 and employment size class (1-5, 6-49 and at least 50 persons employed). According to the sampling scheme, enterprises with less than 50 persons employed are selected at random, while any enterprise with equal or more than 50 persons employed is included in the survey. All the enterprises employing 50 or more persons add up to more than 1,.100 units. The sampling design of the survey rotates some units out and rotates new units in each year (belonging to employment size classes 1-5 and 6-49 only) to share burden and refresh the sample. Within the weighting structure of monthly retail trade index (base=2015), large scale-distribution accounts for 46.4% of total turnover, while small-scale distribution reaches 48.0% of total turnover.

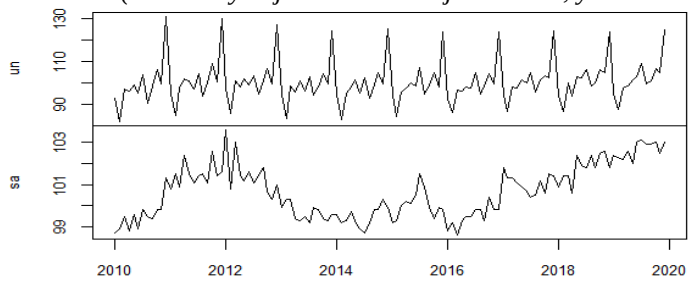
Retail trade indices are calculated as weighted means of the sub-indices of each stratum. To calculate aggregate indices up to the retail trade total, the Laspeyres index is used. The weights are based on turnover data from SBS of the year 2015.

Value of sales indices measures the retail trade turnover over time at current prices and, therefore, incorporates the effects in changes of quantity sold and prices. In order to determine estimates on the volume of sales, value of sales indices are processed to allow removing price effects on turnover, using the Harmonised index of consumer prices (HICP).

Monthly data are first revised in the following month after publication (which occurs 38 days past the reference period). Estimates are then subject to a second revision, which occurs on annual basis and replaces the provisional estimates with the final indices.

Figure 2 shows the monthly evolution of the retail trade index, years 2010-2019[9].

Figure 2 – *Retail trade (seasonally adjusted and unadjusted data, years 2010 – 2019).*



Source: Elaboration on Istat data. Retail Trade Survey

[9] Seasonally adjusted data on retail trade are available at http://dati.istat.it/en starting from January 2003

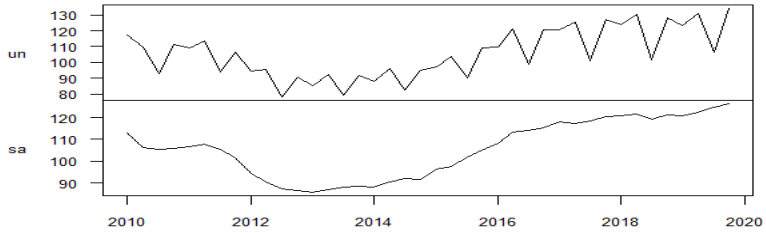
1.3. Turnover in services survey

Quarterly Turnover in Services Survey focuses on short-term dynamics of value of services sold by enterprises, which operate in the services field as a main economic activity.

These dynamics incorporate growth rates of volumes and prices, giving a prompt information. The methodology, the breakdown and the frequency of releases are defined by the European Regulations on short-term statistics (see European Regulations n. 1165/98 and n. 1158/2005 and footnote 9). This is a sample survey, enterprises are the units of observation, while turnover and average number of persons employed by the economic unit in the reference quarter are the variables of interest. Quarterly indicators on turnover in services are calculated for each economic sector, setting 2015 as the base year; these indices are then aggregated according to the Laspeyres formula that uses a weighting structure reflecting the proportion of turnover by economic sector in the base year 2015. The survey does not include retail trade, however it includes retail trade of motor vehicles and motorcycles (NACE Rev. 2 Sections from G to N apart from retail trade as mentioned before)[10]. The sample for this survey includes 1.627 enterprises, starting from 2010.

Figure 3 shows the monthly evolution of the quarterly turnover in services index for Division 45 (seasonally adjusted, base 2015=100), from April 2010 until December 2019[11].

Figure 3 – *Turnover in services – Ateco Division 45 (quarterly data, seasonally adjusted and unadjusted, years 2010-2019).*



Source: Elaboration on Istat data. Turnover in Services Survey.

[10] Economic sectors covered by the survey are represented by the following Sections: G - Wholesale and retail trade; repair of motor vehicles and motorcycles (except of G 47 Retail trade), H - Transporting and I –Accommodation and food service activities, J – Information and communication, L – Real estate activities, M – Professional, scientific and technical activities, N – Administrative and support service activities.

[11] Seasonally adjusted data on turnover in services Division 45 are available at http://dati.istat.it/en starting from 2010.

2. Data analysis: tools and methods

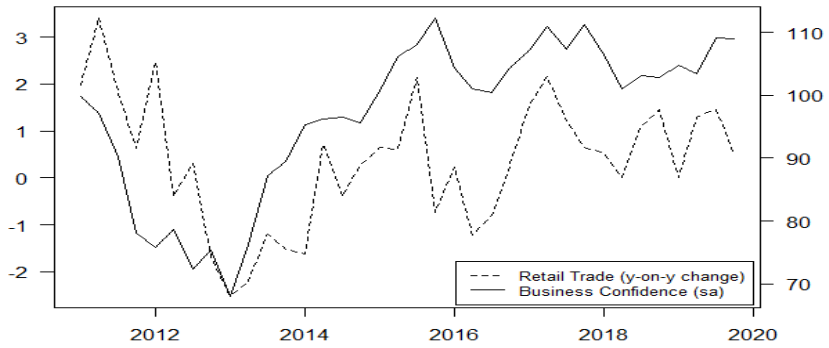
Generally speaking, comparing qualitative and quantitative series can be challenging as quantitative indices indicate quantities expressed in value or volume, while qualitative indices use an ordinal scale of measurement. The balance between the percentage of positive and negative answers can be presented as a diffusion index, therefore the business confidence index can be seen as a diffusion index capturing the movement of the different components. This common component is not necessarily connected to the trend nor to the seasonal component (qualitative data do not have a trend component by definition) and can be interpreted as the cyclical component[12]. Comparing graphics of data from Business Confidence Survey and the other two quantitative surveys was the first step of our analysis. Since business confidence is a cyclical index, it must be properly transformed first in order to be compared to a quantitative index. Concerning our analysis, we applied the year-on-year change, a simple method often used to eliminate the trend and the seasonal component.

2.1. A first graphic analysis

Our first analysis displays the relationship between business confidence in retail trade, covering part of NACE Rev. 2 Division 47 (from 47.1 to 47.7 only), and retail trade index, covering the whole Division 47 (data here considered are those forwarded to Eurostat including NACE 47.3 fuel sector, while at national level Istat disseminates data concerning NACE G 47 excluding Group 47.3): the graph (fig. 4) shows that the two indices have a similar pattern and appear to have a good closeness. The following graphic analysis was focused on comparing the business confidence in retail trade and the quantitative index representing Division 45 of the turnover in services. Fig. 5 shows the relationship between the indices of business confidence in retail trade and turnover in services: in this case, they seem to be closer, although distance between them starts to increase since 2017. Dissimilarity between the two indices can be caused by the different sectoral coverage, by the different sampling scheme of the three surveys and by the different features of the seasonal component, which is higher in the retail trade index.

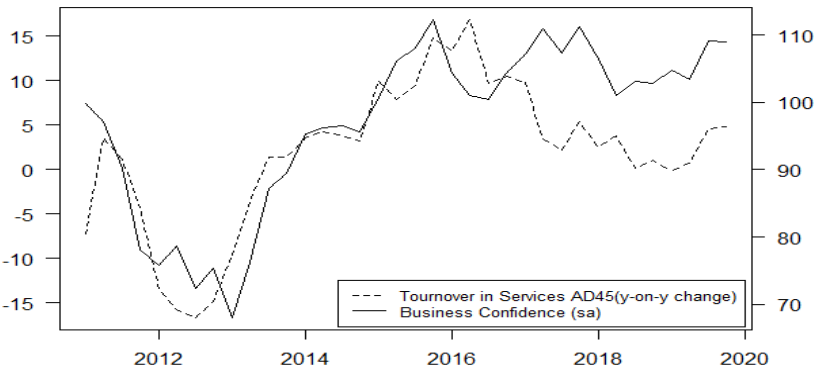
[12] An observed time series can be decomposed into three components: the trend (long term direction that may also be best described by a curved model like a polynomial in *t*); the seasonal component (systematic, calendar related movements); the cyclical component (when data exhibit rises and falls that are not of fixed period and the average length of cycles is between 2 and 10 years) and the irregular component (unsystematic, short term fluctuations, it's the residual time series component after the other components have been removed).

Figure 4 – *Comparison between Business confidence (seasonally adjusted) and Retail trade (year-on-year change) – quarterly data, year 2011 – 2019.*



Source: Elaboration based on ISTAT data. Business Confidence Survey in Retail Trade and Monthly Retail Trade Survey.

Figure 5 – *Comparison between Business Confidence (seasonally adjusted) and Turnover in services (year-on-year change) - quarterly data, year 2011 – 2019.*



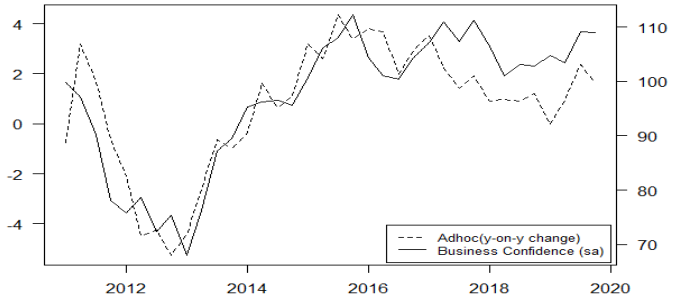
Source: Elaboration based on ISTAT data.

2.2. The new quantitative indicator: an "ad hoc" index

The different sectoral coverage made it necessary to create an ad hoc index involving both the surveyed sectors (Divisions 45 and 47), calculated as a weighted average of the two indices (retail trade index and turnover in services index) where weights reflect the distribution of turnover across the different economic sectors.

Figure 6 shows the new index has a closer relationship and the gap seem to be reduced.

Figure 6 – *Comparison between Business Confidence (seasonal adjusted) and the "ad hoc" index (year-on-year change) - quarterly data, years 2011-2019.*



Source: Elaboration on ISTAT data.

In order to verify previous results, we calculated the correlation between business confidence in retail trade and the three considered quantitative indices.

The values in table 1 show that the correlation between business confidence and the new ad hoc index is higher (0.85) than the correlation between the indicators of each quantitative survey and Business Confidence Survey (Retail trade 0.41 and Turnover in services -Div. 45 0.78).

Table 1 – *Correlation index between qualitative data and quantitative data.*

Confidence – Retail Trade	Confidence – Turn. in Serv. (Div 45)	Confidence – 'Ad hoc' index
0.41	0.78	0.85

Source: Elaboration on ISTAT data.

3. Conclusions and future perspective

Business confidence surveys provide timely information on the short-term dynamics of the economic activity; qualitative surveys are extremely relevant for the short-term economic analysis and exceptionally useful in the building process of cyclical indicators of the economic development as they gather information quickly and do not involve revisions. Moreover, these variables allow anticipating turning points in the economic activity and exploring issues often ignored by quantitative indicators, producing crucial information for policy-makers. There has been much debate on this topic in the economic literature, mainly with regard to the manufacturing sector, while the discussion remained poor concerning the retail trade. This paper investigates the trade sector from 2010 until 2019, comparing the

evolution of business confidence in retail trade with two quantitative indicators, measuring the different sectors of NACE Section G: Retail trade (Division 47) and Turnover in services concerning Division 45 only (Wholesale trade). The graphic analysis shows that the two indices appear to have a good closeness even though they follow different routes towards the end of the reference period. The different sectoral coverage made it necessary to create an ad hoc index involving both the surveyed sectors (Divisions 45 and 47), calculated as a weighted average of the two indices where weights reflect the distribution of turnover across the different economic sectors. This analysis shows that the new index has a closer relationship and the big gap towards the end of the reference period appears to be reduced, also the correlation between business confidence and the new ad hoc index is higher than the correlation between the indicators of each quantitative survey and Business Confidence Survey.

The method we used could also be applied to investigate the association between business confidence index concerning NACE Division G 47 and 45 and the quantitative indicators relating to the same sectors. In addition, further studies could use the most suitable transformations of quantitative indicators (for instance the cyclical component or the seasonal logarithmic difference) to identify the turning points and the expansion and recession phases of the economic cycle. Future works could also verify whether the turning points of the qualitative series of business confidence tend to predict the future movement, to be coincident or to follow the fluctuation in the reference series (therefore additional studies could help classify these indices as leading, coincident or lagging indicators as compared to quantitative series).

References

ALTISSIMO F., MARCHETTI D.J., ONETO G.P. 2000. The Italian business cycle: Coincident and Leading indicators and some stylized facts. *Giornale degli Economisti e Annali di Economia.* Vol. 60, No. 2, pp. 147-220.

BERGSTROM R. 1995. The relationship between manufacturing production and different business survey series in Sweden 1968-1992, *International Journal of Forecasting,* Vol. 11, No. 3, pp. 379-393.

BRUNO G. 2009. Non-linear relation between industrial production and business survey data, *ISAE working papers 119*, Rome.

BRUNO G., LUPI C. 2004. Forecasting industrial production and the early detection of turning points, *Empirical Economics, Springer*, Vol. 29, No. 3, pp. 647-671.

BRUNO G., OTRANTO E. 2008. Models to date the business cycle: The Italian case, *Economic Modelling,* Vol. 25, No. 5, pp. 899-911.

BRUNO G., CROSILLA L. e MARGANI P. 2019. Inspecting the Relationship Between Business Confidence and Industrial Production: Evidence on Italian Survey Data, *Journal of Business Cycle Research*, Vol. 15, No. 1, pp. 1-24.

CESARONI T. 2011. The cyclical behavior of the Italian business survey data, *Empirical Economics*, Vol. 41, No. 3, pp. 747-768.

CESARONI T., MACCINI L., MALGARINI M. 2011. Business cycle stylized facts and inventories behavior: New evidence for the euro area, *International Journal of Production Economics*, Vol. 133, No. 1, pp. 12-24.

CESARONI T., IEZZI S. 2017. The Predictive Content of Business Survey Indicators: Evidence from SIGE, *Journal of Business Cycle Research*, Vol. 13, No.1, pp. 75-104.

CLAVERIA O., PONS E., RAMOS R. 2007. Business and consumer expectations and macroeconomic forecasts, *International Journal of Forecasting*, Vol. 23, No.1, pp, 47-69.

CONTI A.M., RONDINELLI C. 2015. Easier said than done: the divergence between soft and hard data, *Bank of Italy Occasional papers n. 258*, Roma.

CROSILLA L., LEPROUX S. 2007. Leading Indicators on construction and retail trade sectors based on ISAE survey data, *ISAE working papers 77*, Roma.

CROSILLA L., LEPROUX S., MALGARINI M. e SPINELLI F. 2009. Model-based Confidence Indicators for the Italian Economy, *ISAE working papers 116*, Roma.

CROUX C., DEKIMPE M. G., LEMMENS A. 2005. On the predictive content of production surveys: A pan-European study, *International Journal of Forecasting*, Vol. 21, No. 2, pp. 363-375.

EUROPEAN COMMISSION 2016. The Joint Harmonised EU Programme of Business and Consumer Surveys.

GIRARDI A., GAYER C. e REUTER A. 2016. The Role of Survey Data in Nowcasting Euro Area GDP Growth, *Journal of Forecasting*, Vol. 35, No. 5, pp. 400-418.

KOOPMANS T. 1947. Measurement without theory. *Review of Economic Statistics* Vol. 29, No. 3, pp. 161–72.

MARTELLI B.M. e ROCCHETTI G. 2007. Cyclical features of the ISAE business services series, *ISAE working papers 89*, Roma.

McNABB R., TAYLOR K. 2003. Business cycle and the Role of Confidence: Evidence for Europe, *Oxford Bulletin of Economics and Statistics*, Vol. 69, No. 2, pp. 185-208.

MOORE G.H. e SHISKIN J. 1967. Indicator of business expansion and contractions, *NBER Occasional Paper*, No.103.

UNECE. 2015. Handbook of Economic Tendency Surveys, Economic e Social Affairs, *Statistical papers*, Series M, No. 96, United Nations, New York.

ZARNOWITZ V. 1992. *Business Cycles: Theory, History, Indicators, and Forecasting*. Chicago: The University of Chicago Press.

SUMMARY

The surveys on retail trade: comparing qualitative and quantitative indicators

Qualitative survey data, being designed to provide early information which are not subject to subsequent revisions, are extremely useful among the short-term statistics. Hence, qualitative and macroeconomic time series are often considered to be complementary, therefore both approaches are used to analyse the short-term economic evolution. This paper compares the retail trade confidence index (NACE Rev. 2, G 45 and G 47), a business sentiment indicator, along with quantitative data from retail trade statistics (NACE Rev. 2 G 47) and turnover in services data (NACE Rev. 2 G 45) from 2010 to 2019.

First step was merging seasonally adjusted data on retail trade confidence, year-over-year percentage change indices on retail trade and turnover in services indices (division 45 only). Due to lack of accuracy in comparing the above-mentioned series, an "ad hoc" index has been produced, including both economic activities concerning quantitative surveys. The new index has been calculated as a weighted average where weights reflect the distribution of turnover across the different economic sectors. In order to test the reliability of the study, this paper proceeds with calculating a correlation between the two indicators.

Maria Rita IPPOLITI, Istat, marippoliti@istat.it
Luigi MARTONE, Istat, martone@istat.it
Fabiana SARTOR, Istat, sartor@istat.it