

# The Improvement of Response Rates and Data Quality of Direct Business Surveys by Centralized Data Collection Approach: the ISTAT Experience

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## Abstract

In April 2016 ISTAT (Italian National Statistical Institute) started a corporate restructuring process that interested all the statistical production structures and that led to a completely renewed organizational setup. Before the above mentioned reorganization, the statistical processes were organized according to the classical ‘stovepipe’ model, that involved independent, non-integrated, statistical processes including all the necessary skills: statisticians, information technology experts, thematic experts, methodologists. The new model restricts the production processes only to the thematic experts, while all the “cross” expertise isare all assigned to specialized structures. The main advantage of the new setup concerns the overall system efficiency, while the main disadvantage concerns the increased fragmentation of the production processes.

Before the restructuring process, response rates in economic structural surveys were quite low and unsatisfactory. After two years from the introduction of the new organization the medium response rate increased from 48.8 to 59.5 per cent for structural surveys and from 59.0 to 79.0 for short-term surveys. At the same time, the duration of the data collection periods for structural surveys reduced from 152 to 115 days.<sup>4</sup>

## Keywords

*Data collection, response rates, process efficiency, official statistics, business statistics, quality of statistics, non-response, statistical survey*

## JEL code

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## INTRODUCTION

The Response rates ( $rr^5$ ) in economic direct surveys carried out in Italy were traditionally low. Low  $rr$  are partially explained by structural characteristics of Italian economic productive system, that includes a very high number of medium and small-size companies. In 2015, of the total of 4 338 085 active companies only 3 666 had more than 250 employees, just 0.08 per cent. The total number of employees was 16 289 875 of which 3 583 121 belonging to enterprises having more than 250, representing a quota of 22%. Traditionally, in Italy, medium and small size companies showed lower  $rr$  than the bigger ones. An explanation of different  $rr$  corresponding to different dimensional classes depends on the characteristics of the Italian statistical law that imposes an obligation to provide data for all the companies involved in statistical surveys but it applies penalties just for a reduced set of companies, identified according to dimensional variables (number of employees and/or turnover). During the last two years Istat experienced a clearly increasing trend in  $rr$  both in structural and short-term economic surveys. The increase of the  $rr$  was normally associated with a significant reduction of the data collection period. Particularly for main structural economic surveys<sup>6</sup>, the results show (Table 1) that generally speaking the  $rr$  increased by about 11 percentage points ( $pp$ ), whereas for short-term surveys by about 20  $pp$ . The comparisons refer to surveys on enterprises carried out before and after the Centralized Data Collection (CDC) management was implemented in Istat. Notably for short-term surveys the comparison was carried out considering 1<sup>st</sup> quarter 2016 and 1<sup>st</sup> quarter 2018. In the above mentioned framework the main aim of the article is to point out the effects of CDC on response rates of both structural and short-term economic surveys.

**Table 1** General response rates ( $rr$ ) for main structural and short-term surveys pre and post CDC implementation

Type of business survey	Management type	Total survey units (*)	General $rr$ (average for short term)
Structural (**)	Pre CDC	264 698	48.8
	Post CDC ***	231 681	59.5
Short-term (**)	Pre CDC	55 512	59.0
	Post CDC	57 667	79.0

Notes: \* Each unit can be included in one or more surveys. \*\* The main structural surveys and a selection of short-term surveys are included. See Tables 2 and 4 for the complete lists. \*\*\* Considering last concluded survey.

Source: Elaboration on data extracted from Business Statistical Portal

## 1 TRENDS OF RESPONSE RATES IN ECONOMIC SURVEYS AFTER STARTING THE MODERNIZATION PROGRAM

### 1.1 Response Rates in Structural surveys

Among the structural surveys, some responded very positively to the new organizational scheme, that are not only the ones characterized by a low  $rr$  as the Community innovation survey (CIS) that increased by 15  $pp$  in 2016 starting from 53 percent in 2014, but also surveys with an already satisfactory  $rr$  such as Survey on enterprise accounting system (SBS – Structural Business Statistics Regulation), that increased 8  $pp$ , starting from 68 in 2014 (Table 2).

<sup>5</sup> In this document  $rr$  are calculated at the end of the data collection phase but before activating the procedures for integrating the missed responses, which may vary from survey to survey, and before making any integration with data from administrative sources.

<sup>6</sup> Community innovation survey (CIS), Statistics by product (Prodcum), Small and medium size enterprise survey – SME (including professional and artistic activities) (SBS), Survey on information and communication technology in enterprises (ICT), Survey on enterprise accounting system (SBS), Survey on Research and Development in enterprises (R&D), Updating of the statistical register of economic units ASIA – Local units, Survey on the activities of foreign controlled enterprises resident in Italy (Inward Fats), Survey on foreign affiliates activities abroad controlled by Italy (Outward Fats).

**Table 2** Structural surveys, response rates and data collection periods lengths

Surveys	Reference year	Total units	Response rate (%)	Response rate difference (%) (*)	Data collection length (total days – d)	Data collection length difference (d) (*)
CIS	2016	32 018	68.1	15.1	143	–92
Prodcom	2017	39 799	56.2	11.6	124	2
SME – SBS	2016	74 207	43.5	11.0	99	–118
ICT	2017	32 255	67.0	5.2	66	–27
SBS	2016	10 558	76.4	8.4	139	–4
R&D	2015	17 977	76.5	–1.0	89	–48
Updating the statistical register of economic units ASIA – Local units	2016	10 536	80.4	–3.8	62	–51
Inward Fats	2015	7 791	74.4	24.2	120	–21
Outward Fats	2016	6 326	69.8	10.2	193	24

Note: \* Comparison was carried out between last concluded survey and the last run before CDC introduction.

Source: Elaboration on data extracted from Business Statistical Portal

Regarding the length of the survey, we can highlight the Small and medium size enterprise accounting system survey – SME (including professional and artistic activities – SBS Regulation) case that was run in 118 days (*d*) less than the previous editions, and the Community innovation survey (CIS) with 92 *d* less; several other surveys were conducted in shorter time, with more than 20 *d* less than usual (Table 2). The analysis of *rr* related to enterprise dimension, enhances the effect of several factors. Table 3 below shows that a relevant increase was registered for SBS (8.9 *pp*) and ICT (9.4 *pp*) surveys, where the enterprises involved with at least 250 employees are more than 3 000. In both cases the increase was higher than the general *rr* variation of each survey (8.4 *pp* for SBS and 5.2 *pp* for ICT), meaning that the impact of the new organizational scheme guarantees effectiveness of the activities run particularly on the larger units. Moreover, the response rates for enterprises having at least 250 employees of these two surveys before the reorganisation was lower than the ones registered for Prodcom and Outward Fats. On the other

**Table 3** Structural surveys, response rates for enterprises having at least 250 employees

Surveys	Response rate (*)	
	Total (%)	<i>pp</i> difference (*)
SBS	86.2	8.9
Prodcom	89.0	–0.5
ICT	91.6	9.4
Outward Fats	90.3	4.9

Note: \* Comparison was performed between last concluded survey and the one run before CDC introduction.

Source: Elaboration on data extracted from Business Statistical Portal

hand, for Prodcum and Outward Fats the variation of the *rr* for enterprises with at least 250 employees was quite different from the previous ones with a decrease of 0.5 *pp* and an increase of 4.9 *pp* respectively and definitely lower than the variations recorded for the survey as a whole (11.6 and 10.2 *pp* respectively). In those two cases, the number of units involved with this dimension is not very high (around 1 200 and 500, respectively) and the *rr* for this specific group was already high before reorganisation (88.9 and 85.4 percent, respectively).

## 1.2 Response Rates in Short-term surveys

Tables 4, 5 and 6 show the results obtained for the first quarter 2018 in terms of *rr* after CDC introduction for a selected set of business short-term surveys. Since these surveys are characterized by a continuous DC (Data Collection) process, the comparison was made at the end of the useful period, introduced with the new sanctioning procedure (paragraph 2.7). Compared with the first quarter 2016, the *rr* shows a positive average variation of 20.0, particularly relevant is the increase of 28 *pp* registered for the Monthly survey on retail sales (MRS). The Monthly survey on industrial production (IPI) and the Monthly survey on producer prices for industrial products sold in the domestic market (PPID) also show significant increases of 20.1 *pp* and 11.9 *pp*, respectively (Table 4).

**Table 4** Short-term surveys, average response rates – I quarter, years 2016 (pre CDC) and 2018

Survey	I quarter 2016 (%)	I quarter 2018 (%)	<i>pp</i> difference
MRS	38.3	66.3	28.0
IPI	58.8	78.9	20.1
PPID	79.9	91.8	11.9

Source: Elaboration on data extracted from Business Statistical Portal

It is also noted that the *rr* of the short-term surveys in 2018 compared to 2016, despite the more stringent tolerance times envisaged by the current sanctions system, are significantly higher at the date of May 2018, particularly for the surveys MRS and PPID.

**Table 5** Short-term surveys, average response rates for enterprises having at least 100 employees – I quarter, years 2016 (pre CDC) and 2018

Survey	I quarter 2016 (%)	I quarter 2018 (%)	<i>pp</i> difference
MRS	51.9	78.1	26.2
IPI	60.2	84.6	24.4
PPID	76.6	94.2	17.6

Source: Elaboration on data extracted from Business Statistical Portal

The increase concerning enterprises having at least 100 employees (Table 5), highlighted by the average *rr* variation from 62.9 to 85.6 percent, associated with an average reduction in the number of enterprises virtually subject to penalties of 63.4 percent according to the new management criteria, is considerably positive (Table 6).<sup>7</sup>

<sup>7</sup> Data used to calculate the response rates in Tables 4 and 5 may not coincide with those used for calculating the indicators transmitted to Eurostat and published at national level; due to the fact that even if there is a monthly deadline for sending the data, the enterprises can still provide the information throughout the month also referred to previous periods, in this case the data are used for the review of indicators. For example, the response rates calculated for the IPI survey near the Press Release at national level for January 2016 and January 2018 are equal to 67% and 81%, respectively, with a positive variation of 14%.

**Table 6** Business short-term surveys, number of enterprises virtually subject to penalties – I quarter, years 2016 and 2018\*

Survey	Enterprises subject to penalties		
	I quarter 2016	I quarter 2018	% decrease
MRS	136	55	-56.6
IPI	1 334	532	-60.1
PPID	378	111	-70.6

Note: \* Number of enterprises virtually subject to penalties is calculated at the end of the 'useful data deadline'.

Source: Elaboration on data extracted from Business Statistical Portal

Given the results mentioned, the main objective of the present document is to point out the causes that explain both the increasing trend in response rates and data collection period reduction. As pointed out in the following text, the main causes concern organizational set-up solutions of the data collection processes, that involved increasing efficiency and standardization. All the results were obtained thanks to the synergies established among DC structures, production structures and IT structure.

## 2 INNOVATIONS INTRODUCED IN THE FIELD OF DC IMPLEMENTATION

### 2.1 Organizational set-up of DC implementation

During 2016 the Italian National Statistical Institute (ISTAT) launched a wide modernization programme whose main objective was to enrich the supply and quality of the information produced, improving the effectiveness and efficiency of the statistical processes. Istat designed and implemented a new organizational set-up that was characterized by the centralisation of all the support services, that were clearly separated from statistical production. The most important innovation subsisted in the creation of the new Central Directorate for Data Collection that was characterised by a very high degree of specialization of activities and Human Resources. In fact it included four Divisions specialised in the following areas: 1) Division for design of data collection tools; 2) Division for data collection organization; 3) Division for implementation of data collection from direct surveys; 4) Division for integration of administrative sources and registers.

In the reorganization of data collection the goal of specialization was pursued concentrating a series of activities typical for survey's implementation in a single Division. A further internal subdivision concerned the type of responding units involved (businesses, households and individuals, farms, public and private institutions, others). The integration of data collection implementation processes, previously run independently, promoted standardization, with a view to optimizing and increasing efficiency. As a consequence, several process innovations were implemented.

### 2.2 Harmonized survey lists management

The preparation of the survey lists was standardized and generalized, by means of a new procedure involving two successive steps of treatment: i) verification of the eligibility of the units included in the survey samples, in order to define the correct and updated lists of units to be involved in the survey. These units receive the informative letter, signed by Istat's President, announcing the start of the survey. Eligibility is assessed taking into account possible recent business transformation events, insolvency proceedings, registrer modifications and economic activity variations; ii) normalization of the mailing list, verifying for each unit the completeness of register information useful for the correct delivery and integrating possible gaps.

**2.3 Standardization of the contact modalities**

The following standards were adopted: i) single centralized access point both for the data capturing systems (by means of Business Statistical Portal) and for the incoming contacts (free of charge inbound Contact Center) by telephone or by email; ii) system of harmonized standard answers to be used in order to provide efficient and timely resolutions to requests coming from units on non-thematic and recurring thematic issues. The requests are addressed to centralized inbound Contact Center service or directly to Istat DC offices.

**2.4 Strict scheduling for formal end informal communications**

The data collection implementation requires the definition of a strict timetable for the management of the formal and informal communications addressed to the units involved in the surveys. The following timetable has been adopted, following different approaches for structural and short-term surveys.

**Table 7** Timetable of formal and informal communications adopted by structural and short-term surveys

TYPE OF SURVEY	DC START		FIELD DATA COLLECTION							
			Survey reminders pre-deadline				Deadline for data submission	Survey reminders post-deadline		
STRUCTURAL	Sending informative letter	Sending ordinary email to survey contact persons	First reminder by certified email (halfway survey period)	Second reminder by certified and ordinary email (around a month before deadline)	Extra reminder by certified and/or ordinary email (for surveys with low rr or short data collection period)	Telephone recall (about twenty-one to seven days before deadline)	Informative letter deadline (data capturing system closure)	-	-	-
SHORT-TERM			Reminder by ordinary email (about two days before informative letter deadline)	Date of informative letter deadline	Reminder by certified email (about two to ten days after deadline)	Telephone recall (about five to ten days after deadline)	Reminder by ordinary email to survey contact persons (only to enterprises subject to penalties)			

Source: ISTAT

The massive submissions are carried out through a specific software application (named Archiflow) that allows the creation and sending by certified email, scheduling the starting time, of dynamic text messages; massive ordinary email dynamic text messages are managed by means of a proprietary Web application named MMM (Mail Massive Manager).

**2.5 Procedures and tools for monitoring the data collection process**

Automatic and generalized procedures were implemented in order to monitor the entire data collection process. The aim is implementing timely corrective actions to control non-respondents, such as extra

reminders in addition to those already scheduled (by ordinary or certified email, or phone). These procedures allow cyclical (comparing to the previous period of the same year) and structural comparisons (same period of the previous year) on the basis of specific indicators (e.g. response rates). In this regard, particular relevance assumes the management tools provided by the back office of the Business Statistical Portal that allows a detailed analysis of the *rr* for territorial level, economic activity and for specific employees classes.

**2.6 Data capturing and security systems**

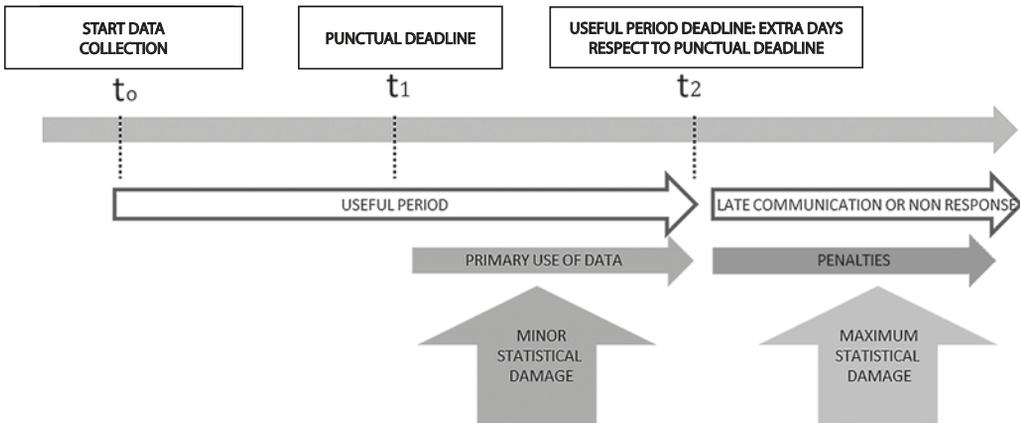
Data capturing takes place in a safe mode through generalized Web systems which allow the storage of raw data in a separate and centralized logical environment that allows monitoring of all deliveries to different recipients.

**2.7 Harmonised penalties management procedure**

The integrated approach to the CDC management allowed the generalization of the procedures used for the generation of the lists of the units subject to penalties. The lists are produced at the end of the DC period, after appropriate check of the most recent register information.

In particular, in the context of the short-term surveys an important innovation was introduced, aimed at redefining the procedure for the identification of units subject to penalties. The new procedure was implemented with the aim to produce timely and quality statistical information while trying to minimise the statistical damage charged on Istat; the statistical damage has been assessed on the basis of the response behaviour by the units involved in the surveys in relation to the phases and timings, as reported in the following Figure 1.

Figure 1 Penalties management criteria in short-term surveys



THE DATA IS USED FOR THE PRODUCTION OF INDICATORS

THE ENTERPRISES TRANSMITTING DATA AFTER THE USEFUL DATA DEADLINE OR NON RESPONDING ARE SUBJECT TO PENALTIES

Source: ISTAT

## **2.8 Innovative tools and services supporting DC activities**

### **2.8.1 The Business Statistical Portal**

The introduction of the Business Statistical Portal in economic survey started in 2013 involving a reduced set of large companies (500 employees and more). In May 2018 about 350 000 companies for about 60 surveys are currently enabled to use the Portal. The implementation of the new system in the context of the economic surveys involved a new approach in the management of economic surveys that turned from “survey-centered” to “enterprise-centered”. Main objectives of the Portal can be defined as follows: a) Streamline the operations required by respondents to fulfill their response obligations, with an overall reduction of the burden; b) Increase both ordinary and extraordinary (e.g. news) communications on the survey events and activities; c) standardize and harmonize data collection in order to increase efficiency at the system level.

### **2.8.2 Centralised inbound and outbound Contact center services**

The new organization of Division for data collection implementation from direct surveys (DCI) also implies more specialization of managing the contacts with respondents. In particular, the outsourcing of the activity is entrusted to a specialized company in Contact Center (CC) services. The aim is pursuing progressive centralization of the support and assistance services addressed to the units involved in the surveys (inbound) and of telephone alert and reminders addressed to non-respondent units (outbound). The unique and coordinated management of the service guarantees strong standardization not only within each specific thematic sector but also among sectors, due to the increased transfer of the best practices from one sector to the other.

## **CONCLUSIONS AND FUTURE DEVELOPMENTS**

The introduction of the new organizational model launched by ISTAT in 2016, which provides a specialized approach to the management of cross-cutting services and the creation of a new Department exclusively dedicated to the Data Collection has produced important results in terms of increasing response rates of economic business surveys, both structural and short-term. The increases are also associated to significant reductions in the data collection periods, especially in structural economic surveys. The results are independent of the platforms used for web data capturing and are extended to all types of surveys. Among the factors that most explain these increases should be considered the standardization of data collection processes that led to significant increases in efficiency. These efficiency gains can free up resources to be used in process and product innovation activities, in the quality of the outputs and to respond to new needs for statistical information expressed by users. Even in the presence of the above mentioned undoubted results, the new organization of the processes has also shown some critical issues that can be resolved in the medium term: i) resistance to change and increase in the conflict between transversal and production structures, mainly deriving from the “subtraction” of some activities that were traditionally managed within the production processes; ii) strong fragmentation of DC processes; iii) permanence of overlaps and doubts about “who does what” in the transversal structures and in particular Data collection.

The main challenges for the future concern the methods and the solutions to be adopted to consolidate the transition process towards the new model: i) development of integrated and generalized platforms for data capturing from units belonging to different sectors; ii) design and implementation of a unique generalized system of integrated management of surveys; iii) greater integration between inbound and outbound contact center services; iv) development of acquisition Portals to increase the efficiency of data collection processes from survey units belonging to different sectors; v) identify solutions to be applied at an organizational level in order to reduce the processes fragmentation, while respecting the principle of specialization and standardization of the activities involved.

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