CRP.3
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EDITING STRATEGIES WHEN EDITING IS ANTICIPATED AT THE DATA COLLECTION STAGE (RESPONDENTS ARE INVOLVED IN EDITING ACTIVITIES)

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1. OVERALL SUMMARY

The data editing process is recognized as one of most costly and time-consuming phases of a survey process. Statistical Agencies often make ineffective editing activities, which determines well known problems like the increase of editing time and costs, the risk of introducing new errors in the data, over-editing, and unnecessary respondent burden due to re-contacts.

Many experiences show that preventing errors is preferable to correcting them in the editing phase. To this aim, instead of increasing the editing effort, resources can be redirected, e.g. by moving editing activities to the early stages of the survey process, preferably when the respondent is still available. This can be implemented through the use of computer-assisted methods. By anticipating data coherence checks closer to respondents it is possible to prevent errors from arising, increase the quality level of recorded data and save resources in the editing stage.

The use of computer-assisted techniques implies not only a technological impact, concerning the development of electronic questionnaires depending on the adopted technique (CATI, CAPI, internet, and so on), but also the need to design the editing "strategy" by balancing accurately as much as possible timeliness, quality requirements and mainly respondent burden.

Finding a balance point among these aspects requires an accurate design of edits underlying the computer-assisted data capturing phase: the kinds of edits (logical, statistical, hard or soft ones depending on whether respondents can skip incoherent situations), how many rules, taking into account the survey objectives, the nature of the variables, the relevance of items and relationships among them.

How to integrate and harmonize the editing activities performed in both the computer-assisted and the editing stage, as well as how to rationalize the available resources among these two phases are survey-specific problems. To this aim, the amount of time and resources to be allocated in each editing stage is to be determined, as well as the trade-off between the expected quality level from the two stages and the respondent burden due to editing in the data capturing phase and that due to re-contacts in the editing phase.

Summarising, the presence, the extent and the type editing performed at the data entry stage with respect to that performed in the traditional data editing stage depends on 5 elements:

- the amount of development resources dedicated
- the sophistication of the electronic option selected
- the security of the transmission that is required
- the quality of the data that is required
- the amount of respondent burden that is acceptable.

2. MAIN ISSUES

Two main research areas can be identified in the area of moving editing as close as possible to data providers:

- the use of Internet or other forms of electronic data transmission
- the use of Computer Aided Interviews (in general CATI, CAPI)

The wide spread use of IT and the increasing use of electronic data storage, management and data transmission encourage Statistical Agencies to exploit as much as possible the use of IT-based approaches to data collection, in order to optimise the effectiveness of both data capturing and survey processes and obtain information from data suppliers (persons, enterprises, Private Agencies, Public Administrations) with higher guarantees from the point of view of:

- improving data quality
- improving timeliness
- reducing organizational costs (questionnaire delivery, coding, data entry, data editing, etc.)
- confidentiality
- reducing respondents burden
- reducing non-response by increasing cooperation and offering benefits to data providers.

As relating to costs, from the Statistical Agencies point of view, the use of IT for data capturing produces a concentration of costs at the design phase of the questionnaire and the need to manage and improve relationships with respondents. Costs relating to "traditional" paper and pencil data mode of collection (e.g. due to questionnaire reproduction, mailing, data coding, data entry) can be considerably reduced, as well as the timeliness of data transmission and further data processing. Relating to the latter point, note that, for example in the EU context, timeliness has become a crucial element because of regulations imposed to Member Countries to provide both preliminary and final results by predefined deadlines.

As relating to the design of electronic questionnaires, to be used either via web, CD, diskettes or via CAI approaches to data collection, and respondent burden, the statistician's efforts aim at managing the following problems:

- designing efficient questionnaires (type and amount of questionnaire items, structure of the questionnaire, adopted definitions and question's wording), in order to simplify the process for data providers (particularly businesses) and allow them to capture electronic information directly from their own data bases
- finding solutions for improving the data provider's cooperation and availability in editing their own data
- finding a balance between quality requirements and the risk of increasing respondent burden with corresponding decrease of cooperation.
- designing and managing in an appropriate way error messages and information to data suppliers in order to simplify and make the data reporting task for respondents more efficient.

As relating to respondent burden, not only an efficient questionnaire design, but also other elements are to be taken into account in order to increase the cooperation level and reduce the non-response rate:

- How to improve the cooperation of data respondents? There are very different situations depending on the type of respondent (private citizens, businesses, private agencies), the type

of required information (economic information, sensitive information like health or social attitudes, and so on), and the existence of government rules.

- Statistical Agencies have to make maximum effort in adapting as much as possible their tools and requirements (in terms of type and amount of required information, adopted definitions, wording, questionnaire structure) to the respondent's technological and informative capabilities.
- Users require guarantees from the point of view of security of their own data. One critical problem for Statistical Agencies is how to preserve data confidentiality during and after the data capturing stage.

As relating to data and process quality, the main problem for Statistical Agencies is on the one hand, to define and guarantee the minimum level of quality for electronically provided data, and on the other hand to integrate the use of IT in traditional survey and data treatment processes. In this area, the following main aspects have been highlighted:

- Integrating the use of electronic/CAI approaches with the overall survey data processing. This implies an overall redesign of surveys in a *quality assurance* context, in which it is needed:
    - designing the appropriate set of edits (in terms of type and amount of checks) to be anticipated in the data capturing phase in order to prevent the most critical errors on the most relevant items while preserving the cooperation level (i.e. the response level) and the data timeliness;
    - harmonising editing performed at the data capturing stage through the use of electronic/CAI approaches, and "traditional" editing performed at the post-data collection phase. Integrating different approaches to data editing and validation produces increasing complexity for the management of the overall information flow and the different data processing steps. The goal here is to find a trade off between quality, respondent burden, timeliness, and costs.
    - integrating the use of electronic questionnaires with traditional paper questionnaires: it is not reasonable thinking that surveys could use only electronic tools, because of reasons relating to the characteristics of respondents and/or required information. *Mixed* approaches to data editing and validation are required, with increasing complexity for the integration and the management of the overall information flow and the different data processing steps.

3. SOME DISCUSSION POINTS

1. How to effectively test, measure and evaluate the impact of the introduction of IT on data quality with respect to traditional data collection+post-data collection editing strategies?

2. How to design the best data capturing strategy given the Statistical Agency information and quality needs, the data supplier characteristics (households, businesses, Private or Administrative registers)?

3. For electronic questionnaires, the optimal timing of when to perform the edits is another issue, i.e. while filling out the questionnaire or just before the questionnaire is submitted (need to balance between cooperation level and simplicity of making corrections)?

4. Increase respondent rates:
   - Which strategies/incentives can be adopted for improving cooperation?
   - Improve technological and methodological tools for improving the preservation of data confidentiality.

5. Assessing for which type of surveys the use of IT is more appropriate and effective, taking into account:
   - type of respondents
   - required information
   - survey targets (in terms of required information) and survey constraints (in terms of time, costs,)
   - survey periodicity

6. The future: integration of several sources of information:
   - archives and registers (either administrative or not)
   - IT data transmission (WEB files, CD, diskettes)
   - Personal or telephone surveys using Computer Aided Interviews
   - Paper and pencil

7. The future: mixed survey data processes, in which data capturing technologies and methodologies are combined together and the editing process is split and in several parts to be appropriately integrated and optimised. Need for experimentations/applications aimed at identifying:
   - the optimal survey strategy
   - the best editing strategy, i.e. the optimal balance and harmonisation between editing activities performed during the overall survey process
   - the optimal trade off between respondent burden, timeliness, costs, data quality

4. SOME MAIN AREAS FOR FURTHER RESEARCH

- Evaluation of the existence of an “editing mode”, i.e. the different levels of edit failures in self-administered questionnaires vs traditional post data collection editing
- How to control the trade off between amount of non response and measurement errors due to web strategies
- Efficient resources allocation when web-based strategies are used
- Identify criteria to balance the use of edits in the collection and in the post-collection stages, prioritising edits to be used in a web instrument for optimising the overall editing efficiency
- Need for evaluation studies in the area of measuring data quality improvements resulting from partially editing data in the Internet data collection vs editing entirely performed after the data collection stage.
- Identify strategies to increase low response rates for web-based questionnaires.
- Improve cooperation between questionnaire developers and edit managers.
- Identify strategies for managing the security issues for the transfer of data over the internet.

3. PAPER'S SUMMARY

WP 11 - Data editing by reporting enterprises (*Invited paper - Pedro Revilla et al. – Spain*)

Paper summary
The paper describes the cooperation obtained by responding enterprises for surveys when using a wholistic approach and treating them as both data suppliers and customers with respect to incentives, coordinating questionnaires, and being directly involved in the editing processes. The statistics agency uses TQM as a method to improve production processes and to obtain higher quality output. In this approach, the data suppliers (respondents) are an integral part of the production system.

Authors discuss the case of business surveys using electronic data delivery via Web, and highlight some crucial aspects related to this innovative and promising strategy. This strategy is based on two key points:

- as businesses are part of the statistical production process in two different ways (data providers and data users) they are to be directly involved in the data quality check as the statistical process begins with the data collection stage;
- efforts are to be made to improve the dialogue between the Statistics Agency and the respondents, in order to improve cooperation and quality of provided information.

Main discussion points

1. The need of Statistical Agencies to adapt their data capturing strategies to the respondent's characteristics and capabilities. Electronic questionnaires should be adapted to enterprise's accounting systems, since the required information is directly available in the accounting systems themselves. Questionnaires should be tailored and personalised.

2. Incentives for increasing the co-operation level, and consequently the reported data accuracy, are to be found. The achievement of this goal has to take into account the respondent's characteristics, the respondent's needs and their technological level. In this regard, in the paper a solution is indicated based both on the strict correspondence between data providers and data users, and on the fact that businesses have high technical conditions and are highly interested in receiving timely information on their market share. This resulted in an auditing system where enterprises could offer feedback to the Statistical Agency if they felt that the data did not meet their expectations.

3. Two problems are of particular interest from the Statistical Agency point of view when developing this type of data collection strategies:

    - need to find a trade off between the enterprise burden of reporting information on electronic questionnaires including soft or hard checks and the advantages of receiving timely information on survey results;
    - need to find a trade off between the Statistical Agency quality requirements (in terms of both data accuracy and timeliness) and the risk of disheartening respondent co-operation.

4. These problems are strictly related (and in some sense they originate) to the problem of designing the appropriate editing strategy to be embedded in the data capturing phase. What is the most appropriate amount and characteristics of editing activities to be delegated to respondents in order to balance the respondent burden, time and costs, and the Statistical Agency

requirements in terms of quality of reported data and co-operation level? Authors suggest, for example, limiting the use of hard edits to relevant quality requisites, providing respondents with facilities like automatic computations and automatic skipping during data reporting. This aspect is recognised as an open problem requiring more investigation and applications.

5. About costs, Authors underline that the introduction of electronic questionnaires like those used in Web surveys implies the re-design of the overall editing strategy. This fact has to be taken into account, because initial costs for Statistical Agencies can be not negligible.

6. Authors identify another problematic aspect related to the use of Web or other forms of computer-aided strategies: Web based response rates are low, which brings up an interesting area of research on how non-sampling errors are resolved with mixed modes of investigation, in which data capturing and editing strategies are to be adapted that are not homogeneous in terms of:
   - respondents availability of dealing with the additional burden derived from having to carry out by themselves given amounts of checks in the data reporting phase;
   - respondents technological capabilities;
   - tailored questionnaires to meet the respondents needs and facilitate data reporting.

WP 35 "Outsourcing" of plausibility improving measures (*Supporting paper - Elmar Wein – German Federal Statistical Office*)

Summary
The paper deals with the problem of optimising the overall statistical data quality by adopting the so-called "plausibility improving measures" at the data collection stage. These measures include the use of electronic tools (like Internet, IT and EDI), and the adoption of an "outsourcing" philosophy (consisting in making data providers perform part of the editing on their own data) in order to efficiently capture and check data at the data collection stage.

The paper defines the term "data winning process" which is a process where statistical information appears for the first time and is distinguished by the origin of the data – for primary statistics it is the data collection process and for secondary statistics it is the external data process. Depending on the data origin and the amount of control of the statistician in data capturing, the Author distinguishes between two types of data retrieval processes: "traditional" processes, in which data collection is largely under the control of statisticians, and survey processes that capture data from external sources (including administrative ones), which are collected without the control of statisticians.

For each type of data collection process, the Author describes the most typical errors affecting data and the potential plausibility improving measures, with regard to data editing specific aspects.

As relating to *traditional data collection processes*, the choice of plausible improving measures to be adopted depends on the survey content, the type of data collection instrument, the data collection mode, and the respondent's ability. In this case, particularly for electronic questionnaires, "outsourcing" (i.e. performed by respondents) plausibility checks at the data capturing stage is the most promising measure.

For *data deliveries*, or "external data winning process", only the quality of data delivery, completeness and consistency can be checked. To facilitate the planning of the data editing

strategies, it is vital to know and understand the data. The paper also defines the "outsourced" plausibility measures for external data.

Possible developments and future work are also discussed.

Main discussion points

- The plausibility of answers is part of the electronic questionnaire development, and it is important that a high level of cooperation exists between the questionnaire developers and editing methodologists for optimising the questionnaire design. Editing methodologists should be involved in any pre-testing and post-testing of the questionnaire.
- Need for pre-tests of electronic questionnaires before introducing them in the survey process, in order to collect information errors and error sources for the design and the harmonisation of the editing activities
- For electronic questionnaires, the optimum has to be found for how many checks to perform without increasing the refusal rate and preserving data accuracy;
- Type of edits appropriate in the electronic data collection stage. An interesting discussion relates to the problem of determining drawbacks due to the use of consistency edits at the data capturing stage. Edits that check consistency are far more problematic and depend on the technical equipment, the ability to navigate within the questionnaire, the complexity of the error, using other information (previous survey data or administrative sources), and whether edits may interfere with more complicated errors which can only be detected in the statistical office. Consistency edits should be limited to few items critical for the survey purpose.
- For electronic questionnaires, the timing of when to perform the edits is another issue, i.e. while filling out the questionnaire or just before the questionnaire is submitted (need of balancing between cooperation level and simplicity of making corrections)
- Need for using incentives to increase the respondent's cooperation level (e.g. free access to statistical data which are relevant for respondents).
- Need to effectively integrate and harmonize editing activities in mixed mode data collection strategies.

As relating to collecting external data from existing registers, the following aspects are underlined:

- the increasing use of enterprises accounting information allows Statistical Agencies to draw information by its direct electronic transfer (Electronic Data Interchange).
- EDI requires high compatibility between definitions and classifications adopted by Statistical Agencies and data suppliers.
- Being that the data collection process is out of the Statistical Agency control, the knowledge of data and data quality (completeness, consistency) is crucial in order to plan editing activities. As much information as possible is needed on supplier definitions, on the information relevance (critical information is probably more accurately checked by suppliers), on checks originally performed by data suppliers.
- Improve the quality of the data by increasing the level of cooperation between the suppliers and the statistics office. Incentives are to be found to make suppliers use specific checks in their data processing, offering appropriate benefits for their additional effort (one solution could be providing software to the suppliers for editing their own data or allowing them to temporary use statistical databases).

Some general discussion points:

- New terminology is defined.
- The wide spread of IT is increasing the electronic data interchange (low costs and burden, high timeliness and data quality, need for harmonizing definitions and concepts)
- data collection modes are generally used in combination, with an increasing part of electronic questionnaires, so the need to balance and integrate the editing activities in the overall survey process is an open area of research
- balancing the editing activities performed during and after the data collection phase, as well as optimising the editing effectiveness at the data capturing stage are areas for further research.

WP 36 - Editing strategies used by the U.S. Bureau of Labour Statistics in data collection over the Internet (*Supporting paper - Stephen Cohen - United States*)

Summary
The paper explores the editing strategy used by the Bureau of Labour Statistics (BLS), where web-based data collection mode has been introduced in some surveys. BLS disseminates information in the broad area of labour economics through a system of establishment surveys, each of them characterised by a specific data processing strategy individually tailored to the survey design to ensure maximum efficiency. In BLS surveys different data collection modes are adopted (paper and pencil, self-administered questionnaires delivered by mailing disks or CD ROMs, web-delivered instruments) depending on the characteristics and purposes of each single component survey, trying to provide data providers with the most appropriate option for submitting their reports.

The paper gives a complete summary of edit practices at the BLS and the types of edits used. Three examples of BLS surveys where the web-based data collection mode is employed, the different editing strategies are illustrated (both editing incorporated into the data collection stage and editing performed at the post-data collection stage). Comparisons between editing when data are collected through standard protocols and editing partially performed during the Internet data collection are also provided. The different survey characteristics and requirements are analysed and linked to the characteristics of the web-based strategy built up for that specific situation.

In general, expected benefits from the redesign of the survey organization including web-based data collection were to control costs, reduce burden and post data collection data revisions, improve quality and response rates.

Main discussion points

- In web-surveys respondents are also data reviewers, so the expected data quality is higher in this approach while the respondent burden and the survey costs are lower with respect to traditional modes of data collection.
- Initial high costs are due to the need for designing electronic questionnaires and to change the overall editing strategy in order to harmonize editing performed at the data collection stage and that performed at the traditional data editing phase.

- Maintaining the respondent co-operation level implies to carefully design questionnaires and accurately select the amount and the type of edits used to notify data inconsistencies to the respondent.
- Affects of mixed mode data collection on non-sampling errors and non response biases in the data are a very interesting topic for survey researchers.
- For establishment surveys, electronic data collection over the internet will be implemented more and more, and the overall editing strategies for web-based questionnaires must be addressed.
- Level of detail of the data verification (micro data, aggregated data).

Some main advantages due to the use of Web mode of data collection are:

- reduction of mailing costs, interviewer costs, data entry costs;
- multimode surveys that include web allow respondents to select the most suitable mode for their circumstances (burden reduction)

Some possible disadvantages are:

- possible high fixed costs for programming and questionnaire testing
- risk of low cooperation level if the editing strategy embedded in the data collection stage is not properly designed.

The Author resumes discussion points separately by *Respondent behaviour issues, Data quality issues, Overall strategy issues*.

1) *Respondent behaviour issues*: Maintaining respondent cooperation

   - need for balancing the amount of editing at the data collection stage (quality), respondent burden and co-operation level, depending on the investigated phenomena and the respondent characteristics (risk of over-editing);
   - what type of edits (hard or soft edits, simple validation edits or more complex statistical/ logical/mathematical relations, longitudinal or cross-sectional, etc.), also depending on the information asked and the respondent characteristics;
   - need for an efficient design of electronic questionnaires, wording, options and facilities for respondents (e.g. information from previous schedules, help system, automatic calculations, etc.) to increase cooperation and reduce non-response (relationship between self administered editing and cooperation level)
   - how to present edits to respondents,
   - appropriate tools to deliver complex edit-failure feedback information to respondents
   - type of information to be collected during pre-testing activities.

2) *Data quality issues:* how to evaluate the benefits in terms of data quality and costs due to the change in the mode of data collection from traditional ones to Internet surveys.

   - existence of an “editing mode”, i.e. different edit failure levels in self-administered questionnaires vs traditional post data collection editing
   - Evaluation approaches when comparing the effectiveness of different modes of data collection
   - How to control the trade off between amount of non response and measurement errors due to the web strategies
   - Efficient resource allocation when web-based strategies are used

- Evaluating the gain in estimates timeliness
- Approaches to evaluate the effects of Internet data collection on data quality.

3) *Overall strategy issues* (need for developing general guidelines to aid decisions when designing editing strategies in surveys and adopting a web-based mode of data collection)
   - Given the variety of surveys, it is not possible to develop generally accepted practices;
   - Criteria to balance the use of edits in the collection and in the post-collection stages, prioritising edits to be used in a web instrument for optimising the overall editing efficiency
   - Need for collecting information during the data processing for further improvements of questionnaires and editing strategies and to prevent errors in next survey repetitions
   - Need for evaluation studies in the area of measuring data quality improvements resulting from partially editing data in the Internet data collection vs editing entirely performed after the data collection stage.

WP 37 - Electronic data reporting – Moving editing closer to respondents (*Supporting paper - Paula Weir – Energy Information Administration, DOE, United States*)

Summary
The paper describes some experiences at the Energy Information Administration (EIA) in performing data editing at the data capturing stage via electronic methods like web surveys, downloadable software and e-mail attachments.

An historical overview of the different electronic data collection methods implemented in the agency is presented and the applications in use today. Most of the 65 surveys conducted by EIA are business surveys. In the paper, new editing strategies designed for some of them to make respondents use electronic methods to provide data are described. Editing strategies involve edits and approaches implemented at both the data capturing and the traditional editing stages.

Particular attention is devoted to a subset of surveys using Internet Data Collection (IDC) mode: the characteristics of edits, editing strategy, data reporting and processing are described. In general, editing is performed as the respondents enter the data. Before submission, all errors have to be corrected or footnoted. Edits are classified as either fatal or warning. Both secure and non-secured transfers are used. Not all respondents use electronic questionnaires so it is important that the same edits are performed on other modes of data collection and that the data from different modes can be integrated and further edits performed.

Advantages and drawbacks of the different modes of electronic data collection are analysed (web surveys, diskettes/CD and downloadable software, e-mail standardised attachments), from methodological, operational and technical point of views. From the Agency point of view, electronic data collection is convenient because data are available more quickly, forms are more readable, some potential errors are avoided at the data entry stage.

The paper gives an interesting review of the development of web-based questionnaires and a good technical description

Main discussion points

- The presence, the extent and the type of fatal and query edits performed at the data entry stage with respect to that performed in the traditional data editing stage depends on:

    - the amount of development resources dedicated
    - the sophistication of the electronic option selected
    - the security of the transmission that is required
    - the quality of the data that is required
    - the amount of respondent burden that is acceptable
- Need that respondents accept and are ready to use electronic methods
- Respondent participation increase if there is the guarantee that provided information is secure and confidential, but security issues for the transfer of data is not necessarily a concern of the respondents, since many chose to use non-secure data transfers. What is the relation between level of security and confidentiality and level of cooperation?
- Respondent participation also depends on the simplicity of electronic forms.
- Need of defining appropriate edits for each type of application
- How to make available and accessible longitudinal or complementary external information possibly used in edits while preserving data confidentiality?
- Need of appropriate messages and information to be provided to users in case of edit failures
- For Internet mode of data collection, high resources and time to develop, test and implementation.
- Editing tools work as an incentive to the respondents for higher quality data.
- The integration of different modes of data collection need to be taken under consideration with respect to the editing process (non-electronic respondents, need of other types of checks):
    - balancing traditional editing with editing anticipated at the data capturing stage. Types of edits to be prioritised and used at the data entry stage. Need of redesign the editing strategy after introducing electronic methods involving data checks.
    - Edits performed on the electronic reports are the same edits performed on respondents using other collection modes;
    - Data from all collection modes are integrated and further level of edits performed to optimise the editing process.

WP 39 - Survey Data collection over the Internet at the U.S. Bureau of Economic Analysis
(*Supporting paper - Patricia Walker - U.S. Bureau of Economic Analysis*)

Summary
The Bureau of Economic Analysis (BEA) collects, maintains, improves data on U.S. direct investments abroad and foreign direct investments in the United States, on the financial structure and operations of parents and affiliates and on balance of payments transactions between parents and affiliates. The paper summarises the progress made at the BEA for converting paper-based collection modes to electronic modes over the internet in its surveys, keeping in mind the need to improve survey response, and improve the timeliness and quality of the data. In particular, errors associated with manual data entry can be reduced. The general context in which the transition has begun and the overall strategy underlying the project are highlighted. The Agency and respondent requirements, as well as the editing strategy adopted at the data entry stage are analysed.

In particular, in the paper the main characteristics of the Automated Survey Transmission and Retrieval (ASTAR) System used in one of BEA surveys to allow electronic data entry are described. The system allows respondents to link directly into their accounting systems. Edit checks for limiting item non-response and data inconsistencies are implemented before the data is

submitted. The basic edits are checking the validity of the fields, missing values, and sums detail items. Fatal edit checks occur when country and/or industry codes are not provided. Some computations (e.g. totals) are automatically performed by the system. ASTAR has an encrypting and decrypting system for ensuring data security and confidentiality. An import facility allows respondents to link directly to their accounting systems to prepare data for transmission without need of data entry.

The characteristics and purposes of a testing activity performed on a pilot program are presented in some detail. An analysis of results, in terms of respondents participation and timeliness, due to the use of ASTAR in a BEA survey are described. In particular, the number of respondents using the system is increasing slightly and now totals about 25 percent.

Main discussion points

- Improving response rates by reducing respondent paperwork and time burden and simplifying data reporting.
- Reducing costs associated to data conversion (from paper to electronic form) and handling of paper forms (printing, mailing, keying of data etc.)
- Increasing data quality by reducing and possibly eliminating errors due to data capturing and data conversion.
- Increasing timeliness, particularly for high frequency surveys, reducing the revisions between the preliminary and final estimates and increasing the survey coverage
- High initial costs for developing and testing an electronic data collection method
- Need for integrating electronic data collection in the overall survey process, including the editing stage
- Give guarantees about security and confidentiality
- Technical aspects (passwords, data retrieval, interface, wording, information and help, etc.)
- Great effort and evaluation studies are needed to develop and test electronic data capturing systems.
- Electronic data capturing is more required for large surveys (where costs due to paper mailing and keying, data conversion and post processing are higher) very frequent surveys or when accurate preliminary estimates are required.
- Electronic forms and interfaces are to be designed to meet respondents requirements (simplicity, content)