

Results of the Evaluation and Redesign of the Dutch Structural Business Statistics Questionnaires

Deirdre Giesen*

Statistics Netherlands

1. Introduction

At Quest 2003 I presented an evaluation plan for the Dutch Structural Business Statistics Questionnaires (SBS) (Giesen, 2004). In the course of 2004 and 2005 this plan has been implemented. In this paper the results of this evaluation are presented.

2. Overall redesign of the SBS survey

The evaluation and redesign of the questionnaires is part of a larger redesign program for the data collection of the SBS survey. The general goal of this program is to reduce the costs of the survey for both our organization as well as the respondents and to remain or even improve the quality level of the statistics produced.

The redesign program focuses on three main goals: 1) the reduction of output variables, by critically examining the legal and statistical necessity of each variable; 2) the reduction of the sample size, by using administrative data and 3) the improvement of the remaining data collection.

The work presented here focuses on the evaluation and improvement of the current mail questionnaires. There are two other important initiatives for the improvement of the data collection. First, an electronic version of the questionnaires is being developed. This project is discussed elsewhere in these proceedings by Ger Snijkers. Second, Statistics Netherlands (SN) is exploring means to collect the SBS data by directly extracting the needed variables from the businesses' administrations, using XBRL (eXtensible Business Reporting Language). We expect that in the long run this will be a very efficient and effective tool for part of the SBS data collection.

3. The SBS questionnaires

The SBS questionnaires measure a large number of indicators of the activity and performance of Dutch businesses. The questionnaires are sent out by mail yearly to around 80,000 establishments, covering all size classes and almost all branches. Different sample and follow-up strategies are used for businesses according to their size and relative weight in the published statistics. For all firms response is mandatory by law. In 2003 over 84,000 questionnaires were sent out, with a response rate of 70%. Of all SN establishment surveys, the SBS ranks second with respect to response burden, measured as the time needed to fill out the questionnaire.

* The views expressed in this paper are those of the author and do not necessarily reflect the policies of Statistics Netherlands.

SBS data are collected through the mail by means of paper forms. The questionnaires are long; more than 15 pages are typical. The structure of the questionnaire consists of three main parts. The first part taps sales, other revenue and costs according to the definitions of SN. The second part of the questionnaire is a summary of the profit and loss account. This summary starts with the total amounts of the revenues and costs reported in part one. Together with the financial results, the provisions and extraordinary items this sums up to the operating profit before taxes. These first two parts are practically identical for all industries and all size classes. The third part of the questionnaire contains industry specific specifications of revenue and costs.

Figure 1: Layout of the SBS questionnaire

4. Outline of the evaluation and redesign of the SBS questionnaires

The main goal of the evaluation of the SBS questionnaires was to assess where and how the SBS questionnaires should be improved with respect to the response burden and the quality of the collected data. Because of the structure of the SBS questionnaires - with specific questions and question wording for different industries and size classes - the evaluation had to cover about 180 different questionnaires and a very heterogeneous population.

The evaluation and redesign consisted of four main steps:

1. An inventory of questionnaire problems based on the information already available.
2. A diagnosis of questionnaire problems with respondents in the field.
3. Revising the questionnaire based on the findings from step 1 and 2.
4. A test of the revised questionnaire.

Following a pilot study by Hak and Van Sebille (2002), we used the response process model of Sudman, Willimack, Nichols and Mesenbourg (2000) as a framework for evaluating and testing the SBS questionnaires. We used several methods in each phase.

4.1. Inventory phase: assessing main problems

In the inventory phase we tried to gain an overview of the problems in all different questionnaires and groups of respondents by using a mix of qualitative and quantitative methods. The methods used included:

- Review of previous reports on SBS questionnaires
- Analysis of 66 completed questionnaires
- Analysis of 2223 respondents' remarks
- 8 focus groups with Statistics Netherlands staff (e.g. field workers, call center staff, editing staff)
- Quantitative analysis of unit response, item response and plausibility of raw data of the data collection in 2003.
- Expert advice on the layout of the forms by a form designer.

4.2. Diagnostic phase: validating and exploring findings from inventory phase in the field

Based on the questionnaire problems found in the inventory phase we designed our next step. The goal of this step was to validate the findings of the inventory phase and to further explore the causes and possible solutions for the problems found. We did this by observing and interviewing respondents and non-respondents of the SBS survey. We conducted 27 site visits of respondents of the SBS. Each visit was conducted by a team of an SN field officer and an interviewer.

At eleven firms we observed how the respondent completed the forms. During the observation we tried to refrain from interrupting or influencing the response process. Afterwards we conducted a debriefing interview and then the field officer made corrections on the form – if necessary – or gave additional information about the questionnaire. The advantage of observing the actual completion of a questionnaire (on-site and in real-time) is that things can be noticed that would be hard to reconstruct retrospectively.

There are also drawbacks to observation. Completing the SBS questionnaire sometimes takes several hours and multiple sittings, which would have been hard to observe. Respondents who are observed might make a bigger effort, might use the observers as informants when they encounter problems, or might feel under pressure to finish quickly. Because of these potential drawbacks of observation we also visited twelve firms who had already completed and returned their SBS questionnaires. Following the method used in the pilot study by Hak and Van Sebille (2002), we interviewed these respondents about how they had completed their form, carefully reconstructing how they had arrived at their answers.

At four other firms we interviewed respondents about their experiences with and opinions of the SBS questionnaire. We conducted these interviews with two respondents who were not able to complete their forms because their annual financial report was not yet available. Two other respondents worked at an administrative office that handled the SBS questionnaires for many different firms.

Next to these on-site interviews with respondents we conducted 14 telephone interviews with non-respondents of the SBS. We did this to explore whether non-respondents had specific problems with the questionnaire that might differ from problems experienced by respondents who had completed the questionnaire. It appeared that most non-respondents had refused for other reasons than questionnaire characteristics. Many had not even opened the envelope.

4.3. Redesign phase

The inventory and diagnosis phase resulted in a long list of recommendations for the improvement of the questionnaires. The recommendations concerned the layout of the questionnaire, the content, order and wording of the questions as well as the overall communication with respondents about the survey.

These served as input for a redesign of the questionnaires. The redesign was done in a multi-disciplinary team under the supervision of the department that issues the questionnaires. Part of this team were members of the team that had evaluated the questionnaire (including the form designer and a field officer), staff from the data collection department that will have to field the questionnaires, editing staff and data analysts.

5. Test of redesigned questionnaire

The questionnaire redesign was applied to two examples of the SBS questionnaires. These were tested in two steps. First we tested the new questionnaire with SN staff. We conducted a laboratory test with field officers and we organized an expert review of questionnaire users. With this preparation we hoped to prevent wasting expensive field-test time on errors that could easily be detected by SN staff. Second, we conducted 26 site visits of respondents. We used the same methods as described for the inventory phase: either observing or reconstructing the response process on-site.

5.1. Results of the inventory and diagnostic phase

To fully complete the SBS questionnaire, respondents need to carefully project their own business records on the questionnaire. In the evaluation we found that the SBS questionnaires cause a high response burden and are prone to reporting errors. Even professional respondents who seriously try to complete the questionnaires perfectly can make large reporting errors.

The most important causes of the observed errors are: lack of motivation / time, reporting about a different business unit, interpretation errors, calculation errors and errors reporting the numbers on the questionnaire. The SBS questionnaires seem to be especially ill-suited for small firms and respondents without a background in bookkeeping

5.2. Results of the redesign phase

The general goal of the redesign of the questionnaire was to decrease the response burden and increase the motivation. First, we tried to reduce the response burden by removing some questions from the questionnaire. Which questions could be removed followed from the *reduction of the output variables* project. Second, the layout of the questionnaire was completely revised to make the questionnaire more attractive and easier to complete. An important aspect of the new layout is that each item is presented by three elements: on the left of the page a short label or keyword (such as “total revenue”) indicates the topic of the item; in a space next to the right of the keyword a short explanation or instruction is provided and then on the right hand side of the page there is a box in which an answer can be written. If more text is needed than can be provided in the three lines allowed for the short instruction, additional text is displayed in a footnote. With

this layout we hoped to increase the chance that respondents read the explanatory text. See figure 2 for an example of this layout.

c Bedrijfsopbrengsten		Let op!
	Netto-omzet	Bedragen ex. BTW Schijf € 23.674 als 24
C1	Omzet groothandel Factuurwaarde aan derden, inclusief transitohandel en omzet binnen uw concern.	<input type="text"/>
C2	Handelsbemiddeling Som gefactureerde provies voor het samenbrengen van verkopers en kopers.	<input type="text"/>
C3	Omzet detailhandel Factuurwaarde handelsgoederen geleverd aan consumenten.	<input type="text"/>
C4	Industriële omzet Factuurwaarde zelfvervaardigde goederen en/of geleverde industriële diensten.	<input type="text"/>
C5	Verhuur onroerend goed Factuurwaarde huuroptrengsten onroerend goed.	<input type="text"/>
C6	Overige omzet Omzet uit alle overige uitgeoefende activiteiten die een wezenlijk onderdeel vormen van de bedrijfsvoering.	<input type="text"/>
C7	Totaal netto-omzet = C1 + C2 + C3 + C4 + C5 + C6.	<input type="text"/>
C8	Waarvan buitenland Percentage van het bij vraag C7 opgegeven bedrag dat in rekening is gebracht aan derden in het buitenland.	<input type="text"/> %
Overige bedrijfsopbrengsten		
C9	Geactiveerde productie Waarde van zelfvervaardigde duurzame productiemiddelen die zijn ingezet in eigen bedrijf.	<input type="text"/>
C10	Beheersopbrengsten Vergoedingen voor intraconcerndiensten.	<input type="text"/>
C11	Subsidies en restituties Zowel nationaal als van de EU, exclusief loonkostensubsidies en afdrachtverminderingen op loonbelasting.	<input type="text"/>
C12	Overige, niet eerder genoemde opbrengsten	<input type="text"/>
C13	Subtotaal = C9 + C10 + C11 + C12.	<input type="text"/>
C14	Totaal bedrijfsopbrengsten = C7 + C13.	<input type="text"/>

Toelichting

<p>1 Netto-omzet</p> <p>Wel meetellen:</p> <ul style="list-style-type: none"> - door bereikte eigen vervoer en installatiekosten; - interne leveringen. <p>In mindering brengen:</p> <ul style="list-style-type: none"> - kortingen, bonussen op verkopen; - door berekende, aan derden betaalde vrachtkosten (zie F16); - in rekening gebrachte retourzendingen; <p>Niet meetellen:</p> <ul style="list-style-type: none"> - ontvangen exportrestituties, exploitatiesubsidies (zie C11); - ontvangsten voor ter beschikking gestelde arbeidskrachten (zie C12); - ontvangen schade-uitkeringen (zie C12). 	<p>2 Omzet groothandel</p> <p>Handelsgoederen zijn goederen voor eigen rekening en risico ingekocht met het doel deze zonder verdere bewerking door te verkopen aan handelaars en/of bedrijfsmatige gebruikers.</p>	<p>3 Overige bedrijfsopbrengsten</p> <p>Wel meetellen:</p> <ul style="list-style-type: none"> - opbrengsten uit licenties, royalty's, auteurs-, merkrechten; - ontvangen schade-uitkeringen; - niet-commerciële baten (zoals gebruik dienstwoning, auto van de zaak). <p>Niet meetellen:</p> <ul style="list-style-type: none"> - vergoedingen voor uitgeleend personeel (zie E5); - schade-uitkeringen voor de vervanging van duurzame activa; - ziekengelden (zie E5).
---	--	---

2



Figure 2: New design of the SBS questionnaire

Third, the wording of the questions and explanatory information was revised. The goal of this revision was to make the texts shorter and more readable. Fourth, the structure of the questionnaires was changed in two ways. The industry specific questions (part 3 of the old questionnaire) were integrated with the general revenue and costs questions (part 1 of the old questionnaire). The result of this is that all revenue and costs groups now only appear once in the questionnaire. Also, we experimented with the placing of the summary of the profit and loss account. Two contradictory approaches were tried out: a “bottom-up” and a “top-down” approach. The structure of the old SBS questionnaire is bottom-up. It begins with asking for details about specified categories of revenue and costs and the aggregate of these items is the basis of the summary of the profit and loss account. The findings from the diagnostic phase suggested that a top down approach might be easier for respondents. In this approach the questionnaire starts with a summary of the core financial data mostly according to the respondents own definitions and

then asks details according to the SN definitions on the items within these broad categories. Both approaches were pre-tested.

5.3. Results of the pre-test phase

In the test of the new questionnaires we found that we had partly succeeded in our goals. The new layout of the questionnaire worked very well; respondents appreciated the new looks, were more likely to read the instruction text and made less errors with reporting on the wrong line or adding the wrong numbers. Also, the new, topic-based, structure of the questions worked very well in the test.

Unfortunately the response burden of the questionnaire still remained high and the motivation of the respondents low. The translation of one's own administration into Statistics Netherlands' definitions is a burdensome task that does not benefit the respondent.

The test results were mixed with respect to the top-down or bottom-up approach. Preferences regarding these two approaches differ between respondents, but most like the "top-down" approach more. The completion times in the test showed that the bottom-up questionnaire takes twice as much time as completion of the top-down version. We found however two disadvantages of the top-down approach. The way the top-down approach was implemented still asked for some consistency between the numbers provided in the summary of the profit and loss accounts according to the respondents own books and the numbers provided according to the SN specifications. This was confusing for some respondents. Another important drawback of this approach is that as less controls are forced by the questionnaire, respondents seem to be more likely to make errors.

6. Results with respect to the methods used

In the inventory phase especially the more qualitative methods were very useful as a structured preparation for the field work with respondents. An additional benefit of the focus groups was that it provided an efficient way to involve stakeholders early in the evaluation and redesign process. In this study the quantitative analyses of the data quality, as measured with the unit response, item response and plausibility, were less useful to detect questionnaire problems. Given the complex structure of the SBS questionnaires it was often impossible to disentangle effects of questionnaires, respondents and approach strategies.

However, these quantitative data were very useful in the interpretation of the findings of the qualitative study of the response process. For example, the compelling observations of the response problems of one small business owner, combined with the numbers of registered complaints by small business owners and the high item non-response in this group all point in the direction that our current questionnaires are not well suited for this group.

The combination of both 'concurrent' observation as well as retrospective reconstruction of the response process proved to be a good method to find out which problems occur in questionnaires and why they happen. Also, collecting these data with teams of field officers and methodologists worked very well. The subject matter knowledge of the field officers was essential to detect, understand and correct reporting errors. However, field officers are not trained to unobtrusively observe respondents and conduct qualitative interviews. An important task for the methodologist during the field visits was to safeguard that the data collection about the *response process* was

disturbed as little as possible by the data collection of the *SBS data*. Finally, we found that videotaping some of the visits was very useful. We used this material for the training of the interviewers, for the analyses of the data and for illustrating the results of this study to the stakeholders of the SBS program.

A drawback of the qualitative approach in our testing phase was that we could not make a clear choice between the top-down or bottom-up approach. Our research design did not allow for any quantitative generalizations about to what extent the effects found in our sample would occur in the population. That kind of information would have been very helpful for a far-reaching decision such as what the main structure of the questionnaire should be. If such difficult and far-reaching choices can be foreseen in a future project, it would be wise to include a quantitative experiment in the redesign research plan.

References

Giesen, D. (2004) Evaluation Plan for the Dutch Structural Business Statistics Questionnaires: Using Output to Guide Input Improvements. Proceedings of the 4th Conference on Questionnaire Evaluation Standards, 21-23 October 2003, *ZUMA Nachrichten Spezial*, pp.73-80.

Hak, T. & Van Sebille, M. (2002) Het respons proces bij bedrijfsenquêtes. Verslag van een pilot studie.[The response process in establishment surveys. Report of a pilot study] Rotterdam / Voorburg: Erasmus Research Institute of Management / Statistics Netherlands.

Sudman, S., Willimack, D., Nichols, E. & Mesenbourg, T. (2000). Exploratory Research at the U.S. Census Bureau on the Survey Response Process in Large Companies. In: *ICES II, Proceedings of the Second International Conference on Establishment Surveys*, Alexandria, VA; American Statistical Association, pp. 327-337.