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Understanding Non-Response in Business Surveys from Rasmussen and Thimm's Argument

Elo Claire Odogbo

Doctoral Candidate, INEPAN, Warsaw, Poland

Abstract: **Surveying companies is a challenge because of the element of self-selection by companies which reduces the probability of obtaining representative results. Along with addressing this issue, this article aims to examine the recommendations of other Authors along similar lines of tackling non survey response. It takes the paper presented by Rasmussen and Thimm in this regard, as the basis for explaining non-response, and validates this by reviewing the work of other Authors on survey non responses. The survey conducted by Rasmussen and Thimm had a response rate of 8.4% when conducted with 1031 questionnaires circulated among companies in Germany and Denmark. They observed that official data collections and those linked with development agencies obtain higher response rates. They discuss the filling of missing data through imputation and extrapolation. The authors emphasize that the effect of non-response has to be first established by analysing the obtained data and categorizing the non-respondents into active and passive ones. Mixed mode survey was applied to follow up the non-respondents, where telephonic conversations with the non-respondents revealed additional information. Thus, the article supports the usage of mixed methods of survey through questionnaires, followed by web and phone calls, to obtain high response rates.**

Keywords: **Surveys, Business Surveys, Survey non response, improving survey response, Survey Participants.**

I. INTRODUCTION

Survey non response in the business environment is becoming increasingly prevalent in our day. Recent studies suggest that survey responses today can be as low as 21%, impacting the validity of the research which is dependent on responses. A key factor responsible for this non responses observed has been shown to be self-selection. This is because companies will not typically force their employees to respond to surveys. The outcome of this growing trend is that such research with low response rates cannot stand up to professional scrutiny and thus risks being jeopardized.

To tackle this important issue, several authors have validated the existence of low response rates to business surveys and have proffered solutions which if followed will help increase the number of responses. Others also suggest the use of statistical methodologies such as interpolation and extrapolation to help in analyzing the effect of non response on the research outcome.

This article attempts to review and validate the paper presented by Karsten Boye Rasmussen and Heiko Thimm, named 'Fact Based Understanding of Business Survey Non-Response' which examines Business Survey responses with the aim of reviewing their strategies for tackling non response for tenability and validity in today's Business context.

II. RASMUSSEN AND THIMM'S CONTRIBUTION

Rasmussen and Thimm (2009) validates Baruch's findings that typical survey response rates which were 64.4% in 1975 dropped to 50% in 1995 and are further declining when attaining at least 20% has become a difficult task today. Theyused a sample of 1031 small and medium-sized companies from Germany and Denmark. The response rate in both regions together was initially 8.4% (87 received questionnaires of the 1031). The low response rate gave cause for a phone call remainder, which was carried out on a random basis among the non-responding companies. This improved the response rates when 32 Danish and 11 German companies responded. Thus, business surveys were found to produce unsatisfying response rates.

The business surveys backed by a convincing agency and which might be imposing legally gather high response rates while those conducted by academic researchers are faced with the lower percentages of responses from business organizations. Further, whendatabases regarding population had more clarity and were updated, they facilitated realistic sample selection, thereby fending off the chance of considering the non-response from non-existing companies into the response rates. The lack of experience in differentiating errors that maycreep into the survey process might translate into adding up those due to coverage, sampling as well as measurement into non-response category.

Rasmussen and Thimm's article also had the secondary goal of obtaining data from additional sources and turning this information into facts bringing further insight into the phenomenon of non-response. Imputation, the method of "filling in a value for each missing value through computation" is one such technique. But, the authors remark it to be difficult to apply in practice. The extrapolation technique for investigation of nonresponse bias is named "wave analysis".

The authors opine that the primary goal when investigating non response is to validate the obtained responses by demonstrating that the non-response is either insignificant in size or random (and thus not causing bias). The "data collector's knowledge" is argued to be that if late respondents at a second point in time differ in an explicit direction from the early respondents then the non-respondents will differ likewise at a third point in time (imputation by regression and projection) (Rasmussen et al. 2009) . Thus when no difference in observation is observed, it suggests that non respondents do not differ from respondents. However, non-response analysis might be error-prone and inaccurate unless cautious evaluation is conducted.

Therefore, to reduce the reliance on such sensitive analysis, Rasmussen and Thimm surmised that obtaining further information about non-respondents was the key. They therefore suggest the application of 'mixed method survey' to obtain data such as a combination of personal interview, telephonic survey and mail. Further, collaboration with authoritative agencies or development agencies who have conducted similar surveys and obtained high response rates, would be helpful. However, this result might not adequately capture their expectations. So, the authors propose the usage of response facilitation techniques to improve the response to survey.

In addition, the authors also considered other variations of the application of mixed methods such as the inclusion of further information on non-respondents through the inclusion of external data. This led them to categorize the non-respondents as either "passive" (the non-respondents may have wanted to return the survey, but because of circumstances, could not) and "active" (those who chose not to respond).

Rasmussen et al (2009) opined that while passive non response is rather harmless to the survey, active non response caused by missing interest in the subject area can lead to a bias that seriously damages the results. They thus propose a two-staged approach to delivering the survey where the first stage involves only a very small effort of information activity from the company. The limited information request makes it possible for the researchers to obtain the same amount of information by additional application of mixed methods (e.g. phone & web) and thus ensuring answers and validity in terms of a reasonable response rate in the first stage. This will give researchers the opportunity to approach companies who have expressed interest in the subject area for further research of quantitative longer questionnaires or qualitative interviews.

III. VALIDATING RASMUSSEN AND THIMM'S CONTRIBUTION

A. Significance of non-response in Business Surveys

Dillman (2000) asserted that non-response reduces the sample size, thereby causing incorrect estimates regarding the population. When the research variable is not affected by the non-response, the size of the sample could be increased to obtain representative results. However, when this variable is affected as a consequence of non-response, the results are altered too. This way non-response is assignificant as its impact on the research variable.

Again, where the difference between the responding and non-responding portions of the sample are strikingly dissimilar, it leaves scope for non-response bias. Lahaut et al (2002) examined this issue using a sample of alcohol consumers. They tested whether non-response among the extreme categories in this aspect is overrepresented and proved the point to be true. Even among the respondents, significant difference was observed in terms of non-response bias between those who responded at the first instance and those that answered the survey after follow-up.

Furthermore, Cornish (2002) found that the effect of item nonresponse or response error on misrepresenting the information compromised the authority and authenticity of survey results. The precision of estimators and estimates would thus be affected, leaving room for errors to creep in. The effect of non-response is found to be two-fold. On one hand, it leads to an increase in the sampling variance during analysis, as the number of usable responses is condensed from the actual planned size. On the other hand, the non-response might lead to selective representation, resulting in coverage bias and other such biases as overrepresentation or under coverage that is explained by Lahaut et al,when the characteristics of both groups differ. Thus, non-response is a cause of non-response bias, but the two terms describe two different conditions. Therefore, the rates of non-response have nothing to imply regarding the results of the survey.

Further, the expenditures made on surveys would not be justified unless the intended sample responds. Scarce capital is wasted when these surveys are biased due to non-response and the results are skewed in spite of the human and financial investment that went into the survey process (American Academy of Political and Social Sciences, 2013).

B. Causes of Non-response

Cornish (2002) finds that non-response mainly results due to two reasons. First may be due to the inability to contact the sample units. This inability could be a result of the researcher not being able to locate, identify or communicate with the sample. Lineback and Thompson (2010) further assert that the business surveys are one-time efforts in being cross-sectional and the sampling frame is distributed over a large geographical area in most cases. Therefore, it becomes difficult even for the researchers to gather or follow-up responses, thereby deterring them from keeping a check on the response rates, in time.

The second reason is refusal, when the sample declines to participate in the survey. Bethlehem (2009), further states a third reason behind non-response which occurs when the sample is not in a position to respond to the questionnaire. Cornish (2002) mentions that the refusal might present itself as not participating in the survey or not answering some of the questions of the survey. He also remarks that the subject of the survey and its timing have a bearing on non-response, as participants would not like to be questioned about sensitive or controversial issues, fearing the consequences of answering them. Thus, comfortable topics tend to generate better response rates, he surmise. Delay in obtaining data might also lead to non-response sometimes when the sample units do not respond in the specified time. This is the point presented by Leon (2007). The temporary absence of the responsible personnel or technical issues are the other reasons non-response, as identified by this organization.

Cornish (2002) also states that the population list from which the sample has been drawn has a significant role to play in this aspect. When the population list is not comprehensive or up-to-date or not based on appropriate data, it can negatively impact the sampling methods. Therefore, non-response would be an expected response in this case. Further, when the survey is email or telephone based, the respondents without addresses or phone numbers, cannot be contacted. This results in an increase in the non-response category. Inadequate or incomplete responses from businesses which remain unusable for analysis purposes, also fall into the pool of non-respondents.

Along similar lines, Wang (2004) surmised that since the typical business survey is voluntary, respondents are under no obligation to participate. Therefore, the element of self-selection introduces the uncertainty of whether the organization will eventually participate or not. When the organizations are bombarded with a number of surveys at the same time, they may choose to respond to some while neglecting the others, another potential reason for non-response

C. Response rates

Thompson and Oliver (2012) opine that the performance and quality of a business survey are indicated by its response rate and thus, this percentage creates the first impression of the utility and worth of the study to its users. However, response rates are not significant when the study uses convenience sampling technique, which is not designed based on the probability rates of the units in population or does not follow any statistical sample selection methodology (Schonalau et al., 2002). To this end Schonalau et al. proposed that response rates can be modified by the introduction of invite incentives. Surveys that are simple and those consisting of few questions are found to obtain better response rates.

Furthermore, Thompson and Oliver (2012) identified two types of response rates which are considered for a study. The first one is the unit response rate (URR), which is the percentage of total number of responding sample units of the total

number of actual sample units drawn by the study. Total quantity response rate (TQRR) is the second figure which is the weighted ratio of a 'key estimate reported by responding units'. Thus, for every survey, there would be one URR and many TQRRs (one per each of the key items estimated by the study).

Beard (2013) analyzed the response rates in surveys while suggesting methods to improve them. He noted that response rates in consumer surveys were as low as 5%-10%. However significant increases of about 4% were observed in business surveys, where the data was gathered via telephone, the rate was 40% on an average, which drops significantly to 10%-15% when email or web-based surveys are conducted. Super Survey, an organization conducting business surveys on the behalf of government and private firms, analyzed the response rates in 2009 and claimed that the average rate was about 32 percent, while it increased to 41 percent in case of sample sizes below 1000 units. The firm tried to establish a relationship between sample size and response rates, which illustrates that the response rates for small sample sizes (below 1000) followed a pattern while response rates for large samples varied unpredictably. When the targeted response rates were not achieved by the survey, an analysis of the reasons and the possibility of non-response bias was conducted.

D. Tackling Non-response

Groves (2006) documented various techniques useful for tackling non-response. The first step involved differentiating the responses into various categories, based on demographics or other key variables. Then, the response rates for each of these subgroups are analyzed for the variations in response rates and thus, the possibility of non-response bias. The differences were found to be insignificant or used to identify the need for correction. Again, the external data available about the sampling frame may be used to add up to the information gathered from the survey. Then, the differences among the key variables or the demographic factors among the sub-groups is re-calculated, in order to examine whether the non-response bias is induced by the difference between the respondent and non-respondent behavior while checking for the existence of implications on the survey variables. For further reassurance, the data relevant to key variables may be compared alongside other authentic statistics, if available. Then, the efforts put into gathering the responses may be examined to separate the data set into that obtained at the first attempt and that obtained by further follow-up or with additional difficulty. He asserts that the characteristics of non-respondents would be similar to that of the respondents from whom the data was gathered after much effort. The final option available in the process is to compare the utility of the various weighting schemes such as weighting-class adjustments, post-stratification, imputed adjustments, extrapolation or combinations, on the unweighted original data obtained from the respondents. Each of the steps included in the process may be useful in managing non-response in business surveys. However, they are not free of limitations. Therefore, Groves (2006) recommends the usage of statistical and analytical methods in this regard, in order to add value to the survey.

Gismondi (2013) describes the use of post-stratification, which is a technique which assumes that the probability of response is related to the levels of interest in the aim of the study. It involves dividing the population into a number of strata or adjustment cells, along the lines of categorization suggested by Groves (2006). Post-stratified estimator is then calculated from the unbiased estimator of respondents' mean in the population adjustment cell. Bias is gathered from the non-response rate of each stratum. When the means calculated for the respondents and non-respondents of a stratum are the same, the bias is reduced. He also suggests the use of re-weighing of respondents based on the response and inclusion probabilities, whose product gives the final response probability.

Gismondi (2013) also explains the use of various imputation techniques to determine all missing values among the data, in order to improve the quality of the variable measured by the survey. But, this method does not contribute towards decreasing the non-response bias. Deductive imputation verifies whether the missing values might be obtained from the already gathered values. The missing value is filled with the average value obtained from the respondents in case of mean imputation. In Last Observed Carried Forward (LOCF) method of imputation, the values obtained for the last sample unit are imputed for the missing values. It is useful in case of variables which do not undergo much change over time. Ratio imputation assumes that the value of a variable at a particular time is same as that obtained in the previous observation. This is useful in longitudinal studies, which are carried over a period of time and in case of quantitative variables. Donor estimation may be used after dividing the data into small strata with a combination of respondents and non-respondents and the donor for each non-respondent is identified.

E. Improving response rates

From the foregoing, we would agree that improving response rates would contribute towards improving the authenticity of a study. Snijker et al., (2013) identified three factors that are vital to obtaining high response rates. These are establishing contact with the business, obtaining their support and developing good communication with them. White and Luo (2009) suggest the use of incentives to motivate the sample to participate in the survey. Another technique is to keep the survey form short, so that participants could complete it easily. On the other hand, they warn against the incomprehensiveness of the instrument to collect all the necessary data, by keeping it brief. Follow-up with telephonic reminders and re-mailing of the forms were also suggested by the authors.

Cantor and Cunningham (1999) suggest some approaches to making surveys effective. They suggest that the instrument should be available in all the languages that are prevalent among the participants' sample or the areas of location of the sample. Also, working in close association with some agencies or big organizations or could increase the acceptability and legitimacy of the survey among respondents. They also suggest that the sampling frame should be derived from an updated database. A pre-survey preparation is suggested by these authors, who state that the authenticity of the database must first be tested, so that the sample does not consist of obsolete units. Furthermore, contacting potential participants before sending the actual survey form is recommended to convey the purpose, also gather the information regarding the participant and obtain the commitment to complete the survey. Leaving multiple options of mailing back the completed surveys or speaking out the responses on a toll-free telephone number, is a practice recommended by Cantor and Cunningham (1999). Also, investing in tracking the sample, first with inexpensive techniques such as triangulating the details with that of other free databases also and then reconfirming the outcomes through the purchase of authentic databases, would help ensure that the response rates obtained would be high.

In case of telephonic surveys, Cantor and Cunningham (1999) suggest documenting call histories, schedules and sending messages to the sample. Further, they stress on training the interviewer to be soft, polite and patient, following a logical sequence in asking questions, while conveying the benefits and incentives well in advance to the selected participants and creating a proper introduction in the survey form would assist in obtaining their support.

The findings of Kaplan and White (2003) show that designing an instrument that is simple and easy to answer, supplemented with the usage of reminder mails or post-cards, inclusion of a 'thank you' note and use of cash incentives, rather than gift cards or other non-monetary benefits to motivate the sample, contributed towards improving response rates in business surveys. However, they warn against using high incentives which would skew the responses, where the sample might be obliged to respond in a favourable way to express their gratitude.

The study by Brennan (1990) found that the response rates to business surveys were also dependent on the status of the researcher. When the researcher was a student, they were found to be low and comparatively higher when the survey was sent with the pretext of the researcher being a Research Officer from the same university. Therefore, the trust placed in the researcher is an important aspect of the business survey response rates.

IV. CONCLUSION

Self-selection on the part of organizations increase the bias in business surveys, because it results in a smaller sample size thereby shrinking the sample size and increasing the possibility of coverage errors and non-response bias. This can have a negative effect resulting in a small sample which may have a negative impact on the outcome of the research. Rasmussen and Thimm undertook a study to understand business survey non-response and realized that low response rates were the norm unless research was backed by a reputed name in the market. The significance of low response rates becomes important when it leads to non-response bias. Seeking further data via alternative sources or use of re-weighing methods and imputation are the existing practices for tackling non-responses. Rather than placing reliance upon secondary sources, the authors suggest the use of ways to boost the response rates, by using mixed method survey.

Other studies on survey non-response validated Rasmussen and Thimm's arguments, while making some invaluable recommendations. One of them suggests that the characteristics of non-respondents might be similar to those who were difficult to obtain responses from. Inability to contact, refusal and unwillingness to comment are found to be common reasons behind non-response. Others suggest strategies such as adding incentives to the survey, establishing contact, gaining support in advance and developing good communication with the participants to help increase response rates in business surveys.

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