

Testing Contact and Response Strategies to Improve Response in the 2012 Economic Census

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Abstract

While planning the 2012 Economic Census, the Census Bureau tested six various contact and response strategies to improve the overall response rate to the Economic Census while attempting to achieve earlier response and obtaining more internet responses. The following six tests were conducted during different phases of mailout to achieve this goal:

1. Sending a follow-up mailing containing only a letter to a sample of nonrespondent single-unit companies who initially received a questionnaire to determine industry classification.
2. Mailing a questionnaire to small multi-unit companies prior to the Economic Census to obtain better contact information.
3. Mailing an advance letter prior to the initial mailout to single-unit companies in certain low-response industries.
4. Calling nonrespondent single-unit companies with an automated message reminding them to respond to their census questionnaire.
5. Sending only a letter instead of a questionnaire to single-unit companies during the first follow-up mailing.
6. Sending certified mailings to single-unit companies in certain low-response industries during the second and third follow-up mailings.

This paper will explain the objectives used for each test, how the tests were conducted, how the results were evaluated, and provide preliminary results.

I. Introduction

The Economic Census is conducted every five years (i.e. years ending in 2 and 7) in order to get a measure of American business and the economy. Approximately 500 different form types were mailed to nearly 4 million businesses in October through December of 2012 in order to collect the information needed to produce relevant estimates for the 2012 Economic Census. The type of form and information collected for each business was based on their principle business activity as each industry has different information that needs to be collected. Respondents were asked to provide a range of operational and performance data for their companies. For more information about the Economic Census data see www.bhs.econ.census.gov.

The focus of the Economic Census includes companies of all sizes in most economic industries with employees. How and when a company is contacted varies based on the size of the company. If a company has more than one establishment, it is considered a multi-unit company and is automatically included in the initial mailout. If the company only has one establishment, it is a single-unit company, and only a sample of the single-unit companies are included in the initial mailout. Multi-unit and single-unit companies have different characteristics and respond differently. For example, multi-unit companies received a form for each establishment. The information collected is usually maintained by different departments within a large company and takes more time to complete. In

comparison, a single-unit company only received the form for the one establishment. Therefore, data collection activities were different for the multi-unit and single-unit companies.

Two requests were sent prior to the initial Economic Census mailout. In November 2011, some single-unit companies were sent an industry classification form and in April 2012 multi-unit companies were sent a contact exchange form. The initial form mailout was in October 2012 for multi-unit companies and December 2012 for single-units. The due date for the Economic Census was February 12, 2013 for all companies. Form follow-ups were conducted for single-units in March, April, and May. In comparison, multi-units were followed-up with a letter in March, a letter and/or a phone call in April, and a letter or form in May. Additionally, a fourth and final letter follow-up was sent in July to both multi-unit and single-unit companies.

A company could respond to the Economic Census via two response modes: mail or electronic. A mail response involved the company filling out the paper form and mailing it back to the Census Bureau. An electronic response involved the company filling out and submitting the form via Surveyor for multi-unit companies or via the Internet using a Centurion internet application for single-units. Surveyor is software that the company downloads in order to report their data electronically.

While planning for the 2012 Economic Census, it was decided that contact and response strategies should be tested to see if response could be improved or maintained while saving costs and receiving more internet responses. Research on households has shown that multiple contacts and contacting respondents by a method other than the form does not negatively affect response (Millar, O'Neill, and Dillman, 2009). Additionally, the American Community Survey (ACS) has tested strategies to help increase response and encourage the internet response option. First they found that an additional reminder mailing showed an increase in the overall response (Chestnut, 2010). Then they tested a push strategy for internet and found that sending out a letter instead of a form increased internet response (Tancreto, et al, 2012). The hope was that businesses would follow a similar pattern.

Although different methods have been used to try to increase response to the Economic Census, no formal testing has ever been conducted. Six contact and response strategies were selected based on prior research and previous censuses to be tested during the different phases of the 2012 Economic Census mailout period. The following are the tests that were conducted:

1. Industry Classification Refile
2. Contact Exchange Form
3. Targeted Advanced Mailing
4. Reminder Phone Call
5. Letter-Only First Follow-up
6. Certified Mailing

The reminder phone call and letter-only first follow-up tests were conducted together using a factorial design. Due to a processing issue, an additional test of a letter only follow-up for the third quarter birth single-unit companies was added to the list of tests to be evaluated for a total of seven tests. These tests, how they were conducted, and preliminary results will be discussed in this paper.

Each of these tests had its own set of objectives. For many of them, saving costs was an important one due to the increasing cost of conducting the Economic Census if the methods stay the same. All Economic Census results are as of August 31, 2013 and are not final. The refile results are final as that was sent out the year prior the Economic Census. Only some preliminary results will be presented at this time and cost analysis will not be included.

II. Results Methodology

When evaluating the results, three different analysis methods were used. The first method was calculating a check-in rate, which represents the percentage of companies in sample who returned their form or submitted electronically. The second method was testing the difference in check-in rates across treatments. The last method was evaluating the mean response time. Final results for the study will include the unit response rate and a total quantity response rate, a measure of the percentage of the estimate derived from reported data. The data for evaluating these response rates are not available at this time. Note that all the results given in the paper are unweighted since all the samples

were selected to represent the universe in question (which changes from test to test), but are not generalizable to the population.

A. Check-in Rates

The check-in rate for each test was calculated in the following way:

The check-in rate represents the percentage of sample establishments that returned a form or responded electronically (with or without data). When calculating the response mode level check-in rate, the denominator for all the rates was the same for the given test. The overall rate is approximately the sum of the rates of the different modes. These rates may differ because the overall rate includes companies who were considered checked-in, but used some other mode.

B. Testing Check-in Rates

For all statistical tests performed in this study, a two-sided t-test at an overall $\alpha = 0.10$ significance level was used to determine which comparisons were significantly different. If there was a family of comparisons, the Bonferroni method for controlling the family-wise error rate was used.

C. Mean Response Time

The mean response time was calculated by taking the average time in days from initial mailout until a response was received from a company. The difference was tested by calculating an ANOVA based on the different treatments included in the test.

III. Industry Classification Refile

The Economic Census Industry Classification Form (also referred to as the refile) was sent to single-unit companies a year prior to the mailing of the 2012 Economic Census form in order to help assign the company an industry classification code. The goals of this test were to determine if sending only a letter instead of a letter and form in the follow-up mailing increased overall and internet response. For the refile, a company could also respond by calling the Census Bureau, but they could not respond by phone for the Economic Census.

A systematic sample based on industry and annual payroll of half of the companies eligible for follow-up received the letter-only mailing containing a company's online login information during the first follow-up versus a letter and a form. The number of delinquent companies at the time of follow-up was 29,165. Therefore, 14,583 companies received the letter-only and 14,582 companies received the letter and form.

Table 1 shows the overall and response mode check-in rates for each of the treatments. The results show that the overall check-in rate of the letter and form groups were not statistically significantly different. The internet check-in rate of the letter group was greater than the form group and the mail check-in rate was greater for those who received the form as a follow up. The interesting result was that significantly more companies who received only the letter called the help line and responded via that phone call. This shows that the letter-only merely shifted the response mode but did not increase overall response, which is a positive thing because sending a letter-only is cheaper, as is an internet response.

Table 1: Industry Classification Refile Check-in Rates
Treatment

| Response Mode | Form and Letter | | Difference |
|---------------|------------------------|-------------------|------------|
| | Letter-only (n=14,583) | Letter (n=14,582) | |
| Internet | 23.83% | 12.48% | 11.35%* |
| Phone | 2.99% | 1.57% | 1.42%* |
| Mail | 7.36% | 19.60% | -12.24%* |
| Overall | 34.19% | 33.65% | 0.54% |

* represents the difference was significant

IV. Contact Exchange Form

A contact exchange form was sent to multi-unit companies about six months prior to the 2012 Economic Census mailout. This form asked for the company's most recent contact information so that it was the most up-to-date for the census. The focus of this test was multi-unit companies with less than 1,000 employees. The results of mailing contact exchange cards to larger multi-unit companies for the 2007 Economic Census were favorable in obtaining improved addresses and in improving response compared to 2002, but no formal testing was done. The test for 2012 was conducted to see if the small multi-unit companies showed similar improvements in the 2012 Economic Census. The goal of this test was to determine if sending the contact exchange card increased overall and internet response to the 2012 Economic Census.

The decision to perform this test occurred after the contact exchange forms were printed, so it was decided to exclude 2,000 companies from the mailout for testing purposes. A systematic sample of 2,000 based on industry and annual payroll of the small multi-unit companies was selected to essentially be the control group that would not receive the contact exchange form treatment.

Table 2 shows the check-in rates for the different treatments. The difference in the overall check-in rates is currently not significantly different, as are the differences in the mode level check-in rates. Note that for multi-unit companies, forms are checked-in at the establishment level and not the company level. Therefore, the check-in rates are based on the establishments within each of the companies selected.

Table 2: Contact Exchange Form Check-in Rates
Treatment

| Response Mode | Contact Exchange Form (n=607,992) | No Contact Exchange Form (n=17,964) | Difference |
|---------------|-----------------------------------|-------------------------------------|------------|
| | Mail | 32.4% | |

V. Targeted Advanced Mailing

An advance letter was mailed to a select number of single-unit companies in certain industries informing them the 2012 Economic Census was coming. Certain industries were targeted because of their historically low response rate. This letter was mailed out three months prior to the initial census mailout. The industries selected were as follows: restaurants, hotels and motels, gas and convenience stores, bars, electronic stores, beauty salons, real estate, auto and body repair, home construction, and day care. The goal of the test was to determine if sending an advanced letter increased overall response to the 2012 Economic Census.

To conduct this test, a systematic sample of 10,000 cases based on industry and annual payroll was selected from companies in the targeted industries that were to be mailed the economic census form. Half of those companies were selected to receive the letter with the other half being a control group for analysis.

Table 3 shows the check-in rates for each of the treatments. Even though the results are not final, the difference in all the check-in rates are not significant.

Table 3: Targeted Advance Mailing Check-In Rates

| Response Mode | Treatment | | Difference |
|---------------|----------------------------|-----------------------------------|------------|
| | Received Mailing (n=3,467) | Did Not Receive Mailing (n=3,509) | |
| Internet | 29.5% | 29.5% | 0.0% |
| Mail | 47.6% | 47.9% | -0.3% |
| Overall | 76.8% | 77.1% | -0.3% |

VI. Reminder Phone Call and Letter-Only First Follow-up

This test contained two different strategies for single-unit companies: the reminder phone call and the letter-only first follow-up. The first strategy was an automated phone call reminding the company that their 2012 Economic Census was due soon. The phone calls were made about two weeks prior to the official due date. For the second strategy, cases were mailed only a letter that also contained information to complete the census via the internet versus a second paper form. The budget was available to make 75,000 phone calls and send 75,000 letters. To conduct this test, the randomly selected companies were divided randomly among the four possible treatments: phone call and letter, phone call and form, no call and letter, and no call and form (the control group). The goal of this test was to determine if making the phone call and sending only a letter in the follow-up increased overall and internet response while getting responses earlier.

One issue that was discovered during the planning phase was that company phone numbers were only available from a few sources from a representative sample: the 2007 Economic Census and the Medical Expenditure Panel Survey – Insurance Component (MEPS-IC). Because of that, it was decided that the sample would be selected in three parts. The first was a sample of 7,500 companies for whom the Census Bureau did not have a phone number, but had their phone number researched. A match sample (cases that had the same industry and similar annual payroll) of about the same number were then selected to act as a comparison group. Each sample was then randomly divided between the letter-only and form treatments. The second was all the cases where only the MEPS-IC phone numbers were available. The remaining sample was selected from the companies with a phone number from their 2007 Economic Census response. All the cases from the MEPS-IC and the 2007 Economic Census respondent sample were randomly assigned to one of the four treatment groups.

In total, 149,977 companies were selected to receive one of the four treatments. Table 4 shows the size of each sample and overall size. During the mailout of the first follow-up, only a small number of companies in select industries actually received the letter-only as a majority of the companies inadvertently also received the form a few days later. The industries that received the letter-only were wholesale trade and professional, science and technical services.

Table 4: Reminder Phone Call and Letter-only First Follow-up Sample Sizes by Treatment

| | Call and Letter | No Call and Letter | Call and Form | No Call and Form | Total |
|-----------------|-----------------|--------------------|---------------|------------------|---------|
| No Phone Number | 3,750 | 3,738 | 3,750 | 3,739 | 14,977 |
| MEPS | 2,207 | 2,208 | 2,208 | 2,207 | 8,830 |
| 2007 Respondent | 31,543 | 31,543 | 31,542 | 31,542 | 126,170 |
| Total | 37,500 | 37,489 | 37,500 | 37,488 | 149,977 |

For analysis purposes, respondents were split into two groups. The first group contains only cases for which industries received only the letter. The second group contains the cases in the industries that inadvertently received the form. The check-in rates for each of the treatments can be found in Table 5 for the letter-only group and Table 6 for the letter and form group. Methods are being researched to compare the rates so they can be compared for the different tests. Instead, a two by two (phone reminder X follow-up) ANOVA was calculated on the mean response time of each of the groups for the responding companies that were not included in the certified mailing test.

Table 5: Phone Reminder and Letter-only Follow-up Check-in Rates Treatment

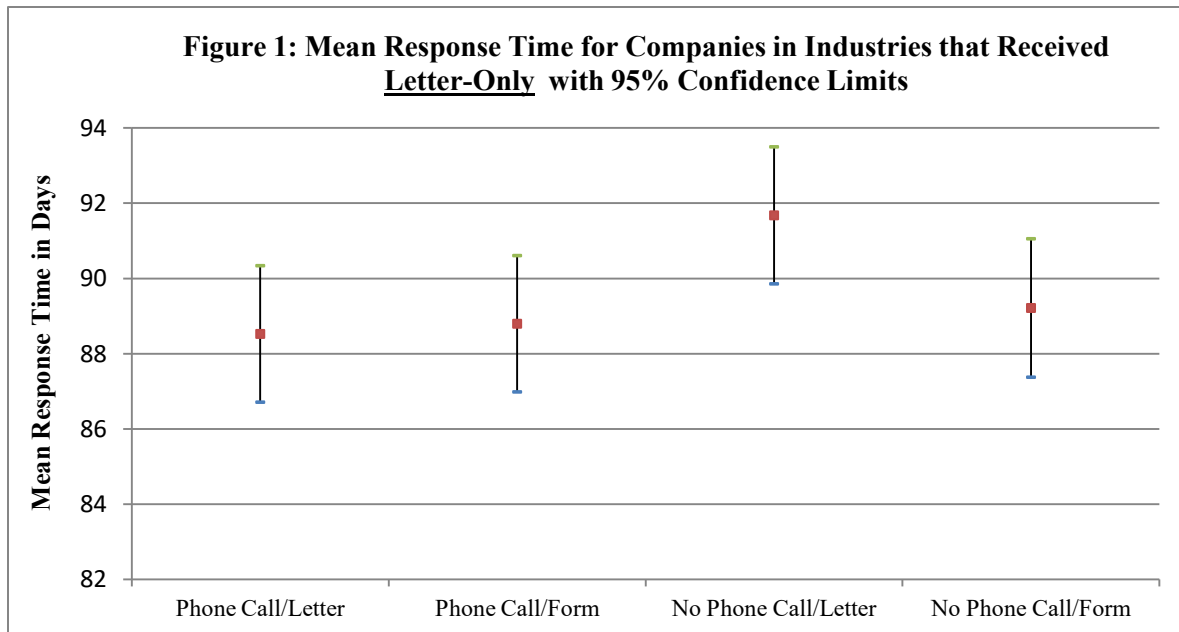
| Response Mode | Call and Letter (n=3,527) | No Call and Letter (n=3,562) | Call and Form (n=3,559) | No Call and Form (n=3,471) |
|---------------|---------------------------|------------------------------|-------------------------|----------------------------|
| Internet | 41.3% | 41.0% | 36.8% | 35.7% |
| Mail | 43.5% | 42.5% | 46.5% | 47.2% |
| Overall | 84.3% | 82.8% | 82.9% | 82.6% |

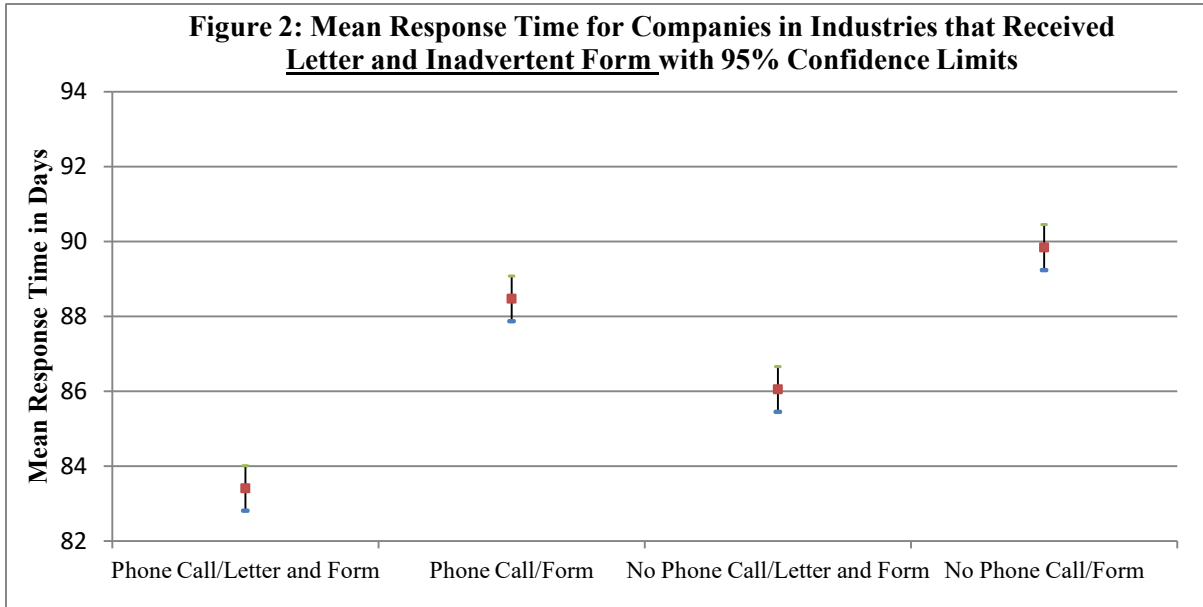
Table 6: Phone Reminder and Letter-only and Form Follow-up Check-in Rates Treatment

| Response Mode | Call and Letter/Form (n=26,199) | No Call and Letter/Form (n=25,974) | Call and Form (n=25,767) | No Call and Form (n=25,498) |
|---------------|---------------------------------|------------------------------------|--------------------------|-----------------------------|
| Internet | 37.0% | 36.7% | 32.2% | 31.6% |
| Mail | 47.9% | 47.7% | 51.4% | 51.2% |
| Overall | 84.6% | 84.1% | 83.2% | 82.4% |

The results show the model with only companies in industries that received the letter-only was not significant: $F(3, 11,277) = 2.42$, $MSE=5,896.69$. Figure 1 contains the confidence intervals for each of the means for each of the treatment groups. Figure 1 shows that none of the individual treatments are significant. It is important to note that the sample sizes are much smaller for this group compared to the second group, therefore the confidence intervals are much wider. Additionally, there may be an industry effect, which is not being accounted for.

The results of the second group containing industries that received the letter and the form as a follow-up show the model was significant: $F(3, 92,984) = 84.48$, $MSE=186,377.5$. Figure 2 contains the confidence intervals for each of the means for each of the treatment groups. Figure 2 shows that the means are significantly different for each of the groups.





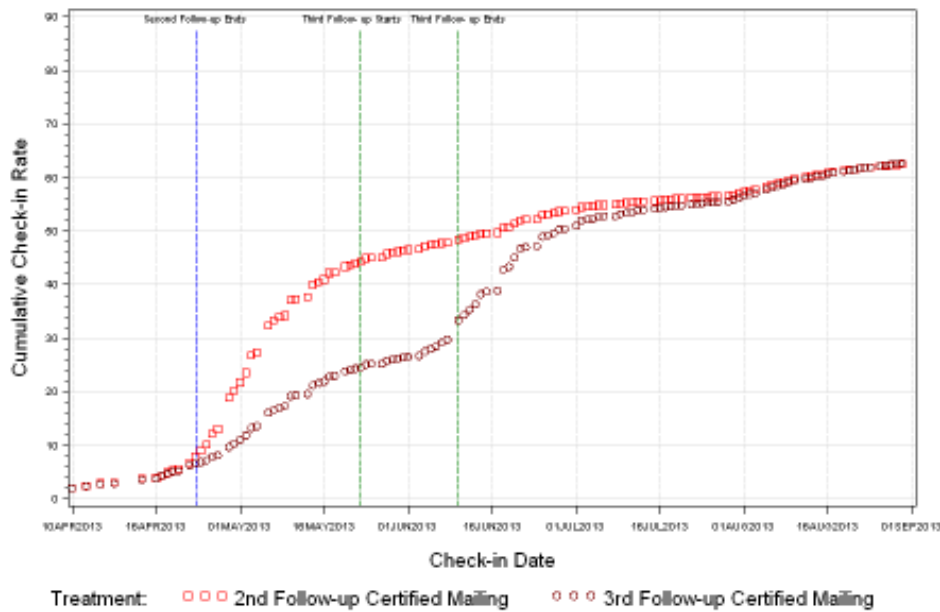
VII. Certified Mailing

A certified mailing is a mail package for which a person has to provide a signature to acknowledge that it was received. In the 2007 Economic Census, certified mailings were sent to single-units in select low responding industries during the third follow-up and that resulted in an increase in response. For the 2012 Economic Census, it was decided to test the certified mailings on single-units again, but in addition to testing the effectiveness, the timing was also tested. Each of the selected low responding industries had half of their companies receive the certified mailing in the second follow-up and the other half during the third follow-up. The goal of this test was to determine if there was a difference in the overall response and time to respond between the companies that received the certified mailing and those that did not in each of the follow-ups.

The analysts selected 96 different industries that yielded 131,203 companies that were eligible for follow-up at the time of sampling. Half of the companies were randomly selected to receive the certified mailing in the second follow-up (65,604 companies total) with the other half (65,599 companies total) in the third follow-up.

Figure 3 shows the overall check-in rate over time for each treatment. It shows that the certified mailings greatly increases the check-in rates for companies that received the certified mailing. More research is being done into whether the second certified mailing had more of an impact than the third certified mailing.

Figure 3: Certified Mailing
Overall Check-in Rates by Date
Second and Third Follow-up Certified Mailing



VIII. Third Quarter Birth Letter-Only Follow-up

After it was realized that many of the letter-only first follow-up companies also inadvertently received a form in the first follow-up, it was decided to conduct a letter-only test on the third quarter birth single-unit companies. These were new companies that were not originally eligible for selection in the 2012 Economic Census but became eligible during the mailout period. The initial mailout for these companies happened in March 2013 with their first follow-up occurring in May 2013. The goal of the test was to determine if sending a letter only follow-up increased overall and internet response

A letter-only follow-up was sent to a randomly selected group of 10,000 companies that were eligible for the follow-up. Table 10 shows the check-in rates for each of the treatments. The overall difference was significant when these results were calculated. The mail and internet check-in rates were also significant as the companies that received the letter-only were more likely to respond via the Internet.

Table 10: Third Quarter Birth Check-in Rates
Treatment

| Response Mode | Letter-Only (n=9,491) | Form (n=41,541) | Difference |
|-----------------|-----------------------|-----------------|------------|
| Internet | 31.8% | 22.4% | 8.4%* |
| Mail | 22.4% | 29.9% | -7.9%* |
| Overall | 53.7% | 52.0% | 1.7%* |

* represents the difference was significant

IX. Conclusions and Next Steps

Seven response and contact strategies (six original and one additional) were tested on companies in the 2012 Economic Census in an attempt to increase overall response. Most of the results are not final and are still being monitored as the Census Bureau is still collecting the data for the Economic Census. The Industry Classification Form (refile) is the only completed test and that showed no significant difference in the overall check-in rate, but the companies that received the follow-up letter were more likely to respond on the Internet. There are possible significant differences in some of the other tests. The phone call reminder and letter-only and inadvertent form test currently shows that both tests affected the response time. The letter-only third quarter birth test currently shows the letter increased response, especially internet response. If the difference remains, the cause of the difference will be researched. The check-in rates will also be modeled for each of the tests to look at the effects. Differences will also be looked for at various descriptive categories (i.e. industry, size). Potential cost savings will be evaluated for each of the strategies using cost models and response rates, which will become part of management's decisions in pursuing response improvement strategies for the future surveys and censuses.

The Census Bureau is currently discussing the response and contract strategies for the 2017 Economic Census. Results of this research will become part of making decisions about which strategies to pursue. It is hoped that this research will also encourage the further use of experimental design in assessing improvements to survey data collection of companies.

X. References

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