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# Monetary Incentives in Mail Surveys

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**Abstract**

Eighteen empirical studies from fourteen different researchers provide evidence that prepaid monetary incentives have a strong positive impact on the response rate in mail surveys. One of these studies is described here and an attempt is made to generalize from all eighteen about the relationship between size of incentives and reduction in nonresponse. These generalizations should be of value for the design of mail survey studies.

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## Previous Research

One of the mail surveys, conducted in 1969, consisted of I00 people randomly picked from the Philadelphia metropolitan-area telephone books.[1] The questionnaire, which was rather long, included a description of a new form of transportation called the Minicar Transit System and 61 questions, some of them open-ended. Fifty of the potential respondents received a dollar "honorarium" with the questionnaire. The other fifty received no money. Seventy percent of the former group and only 22 percent of the latter group responded. While the sample size is small, the difference between the two sub-samples was statistically significant ($p < .05$).

Table 1 [next page] summarizes results of this study and the seventeen previous ones.[2] The conclusions are rather clear: (1) prepaid monetary incentives yield large increases in response rates, and (2) the larger the monetary incentive, the greater the increase in the response rate.

The only exception to an otherwise perfect ranking is the five-cent incentive in Kephart and Bressler's study.[3] This reversal is quite likely due to sampling error. Thus, the rankings were in the expected direction on 24 of the 25 possible comparisons: an increase in monetary incentives led to an increase in response rate 96 percent of the time, a statistically significant result (sign test). Unfortunately, only six of the studies tested multiple levels of incentives, but these studies also support the hypothesis that the greater the incentive, the greater the response rate.

It is important to note that all of the studies in Table I refer to *prepaid* monetary incentives. The *promise* of a reward does not have as strong an effect. Heads and Thrift, in a study on a British population, demonstrated that there was some increase in response rate as the size of the promised reward was increased.[4] However, as shown in the studies in Table 2, the effect of a promised incentive is small in comparison to that of a prepaid incentive.

It is also interesting to note that the payment of an incentive only on follow-up mailings has an effect, but one not quite as strong as when money is sent in the first mailing. Huck and Gleason obtained a response rate of 94

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[1] Scott Armstrong and Terry S. Overton (1971). "Brief vs. comprehensive descriptions in measuring intentions to purchase," *Journal* of *Marketing Research,* 8, 114-117.
[2] Paul L. Erdos (1970), *Professional Mail Surveys.* New York: McGraw-Hill, provides a partial review of the literature.
[3] William M. Kephart, and Marvin Bressler (1958), "Increasing the response to mail questionnaires," *Public Opinion Quarterly,* 22, 123-132. However, there were only three comparisons covering the range from $0.25 to $1.00, a range that would seem to be of particular interest.
[4] J. Heads, and H. J. Thrift (1966), "Notes on a study in postal response rates," *Commentary*, 8, 257-262.

**Table 1**
**Mail Response Rates for Various Prepaid Monetary Incentives;**
**Entries Represent Percentage of Sample That Responded**

| Study | Incentive | | | | | |
|---|---|---|---|---|---|---|
| | None | $.01 | $.05 | $.10 | $.25 | $1.00 |
| Armstrong and Overton[a] | 22 | — | — | — | — | 70 |
| Blumberg et al.[b] | 20 | — | — | — | — | 30 |
| Erdos[c] | 40 | — | — | 54 | 63 | — |
| Erdos[d] | 35 | — | — | — | 58 | — |
| Erdos[e] | 34 | — | — | — | 56 | — |
| Erdos[f] | 23 | — | — | — | 40 | 54 |
| Heckler and Bourgette[g] | 39 | — | — | — | — | 71 |
| Huck and Gleason[h] | 65 | — | — | — | 92 | — |
| Hancock[i] | 10 | — | — | — | 47 | — |
| Kephart and Bressler[j] | 52 | 55 | 54[k] | 57 | 70 | — |
| Kimball[l] | 30 | — | — | 41 | — | — |
| Maloney[m] | 58 | — | — | — | 86 | — |
| Newman[n] | 29 | — | — | — | 47 | 53 |
| Newman[o] | — | — | — | — | 37 | 61 |
| Shuttleworth[p] | 19 | — | — | — | 52 | — |
| Watson[q] | 30 | — | — | 40 | 48 | — |
| Wiseman[r] | 39 | — | — | 47 | — | — |
| Wotruba[s] | 18 | — | — | — | 41 | — |

[a] Armstrong and Overton, op. cit., n. 1.

[b] Herbert H. Blumberg, Carolyn Fuller, and A. Paul Hare (1974), "Response rates in postal surveys;" *Public Opinion Quarterly*, 38, 113-123.

[c] Erdos, op. cit., n. 2, p. 97.

[d] *Ibid., pp.* 97-98.

[e] *Ibid., p.* 98.

[f] *Ibid.. p.* 99.

[g] James C. Hackler and Patricia Bourgette (1973), "Dollars, dissonance and survey returns," *Public Opinion* Quarterly, 37, 276-281.

[h] Huck and Gleason, op cit.

[I] John Hancock (1940), "An experimental study of four methods of measuring unit costs an obtaining attitude toward the retail store," *Journal of Applied Psychology,* 24, 213-230.

[j] Kephart and Bressler, op. cit, n. 3.

[k] This figure is the only exception to otherwise perfect rankings.

[l] Andrew E. Kimball (1961), "Increasing the rate of return in mail surveys," *Journal of Marketing, 25*, 63-64.

[m] Paul W. Maloney (1954), "Comparability *of* personal altitude scale administration with mail administration with and without incentive," *Journal of Applied Psychology,* 38, 238-239. The no-incentive form of Maloney had two follow-ups while the group that got a quarter reward had only one follow-up.

[n] Sheldon W. Newman (1962), "Differences between early and late respondents to a mailed survey," *Journal of Advertising Research,* 2,. 27-39. (2-page questionnaire)

[o] *Ibid.* (4-page questionnaire)

[p] Frank K. Shuttleworth (1931), "A study of questionnaire technique;" *Journal of Educational Psychology,* 22, 652-658.

[q] John I. Watson (1965), "Improving the response rate in mail research," *Journal of Advertising Research,* 5, 48-50.

[r] Frederick Wiseman (1973), "Factor interaction effects in mail survey response rates," *Journal of Marketing Research,* 10, 330-333.

[s] Thomas R. Wolruba (1966), "Monetary inducements and mail questionnaire response," *Journal of Marketing Research.* 3, 398-400.

percent when a quarter was sent on the first mailing, 92 percent when the same amount was sent on first follow-up, 78 percent when it was sent on the second follow-up, and 71 percent when no money was sent.[5]

**Table 2**
**Mail Response Rates for Prepaid vs. Promised Incentives;**
**Entries Represent Percentage of Sample That Responded**

| | Type of Incentive | | | | | |
|---|---|---|---|---|---|---|
| | No | Promised | | | Prepaid | |
| Study[a] | Incentive | $.25 | $.50 | $1.00 | $.25 | $1.00 |
| Blumberg | 18 | — | — | 20 | — | 30 |
| Hancock | 10 | 18 | — | — | 47 | — |
| Wotruba | 18 | — | 20 | — | 41 | — |

[a] See footnotes in Table I for study sources,

**Estimating the Relationship Between Prepaid Incentives and Response**

What generalizations can be drawn about the relationship between prepaid monetary incentives and nonresponse? Consideration has been given only to those studies in which the money was sent with the initial mailing. In order to utilize the previous studies, the question was formulated as follows: "What percentage reduction in nonresponse might be expected from various levels of prepaid monetary incentives?" By stating the problem in terms of the *percentage reduction in nonresponse,* one is able to control for the fact that some studies are inherently more interesting to the respondents than others and thus draw larger response rates. (The response rates varied from 10 to 65 percent when no monetary incentives were provided.) This statement of the problem eliminated from the sample one study, the four-page one by Newman, since it provided no data for the case with no monetary incentive.[6]

One further change was required. Since the studies were drawn from different time periods, ranging from 1931 to 1973, it was necessary to convert to constant dollars. The 1973 dollar was used as the standard here.[7] In current dollars, the incentives varied from one cent to one dollar, as shown in Table 1. In 1973 dollars, the incentives varied from 15 cents to $1.56. This provided substantial variation.

Figure 1 provides a summary of the data. Twenty-four observations were drawn from the seventeen studies since some of the studies provided data on different level of incentives.[8] A crude relationship was obtained by fitting the data to a curve that was consistent with the finding noted above, that each increment of incentive leads to an increase in response rate. In addition, the following a priori assumptions were made:

1. The curve should go through the origin to reflect, by definition, that no reduction in non-response is obtained with no incentive.
2. The curve should approach an asymptote. Obviously, the asymptote cannot exceed 100 percent. An asymptote of 100 was selected under the assumption that "everyone has his price." However, it should be noted that this decision was subject to much uncertainty.

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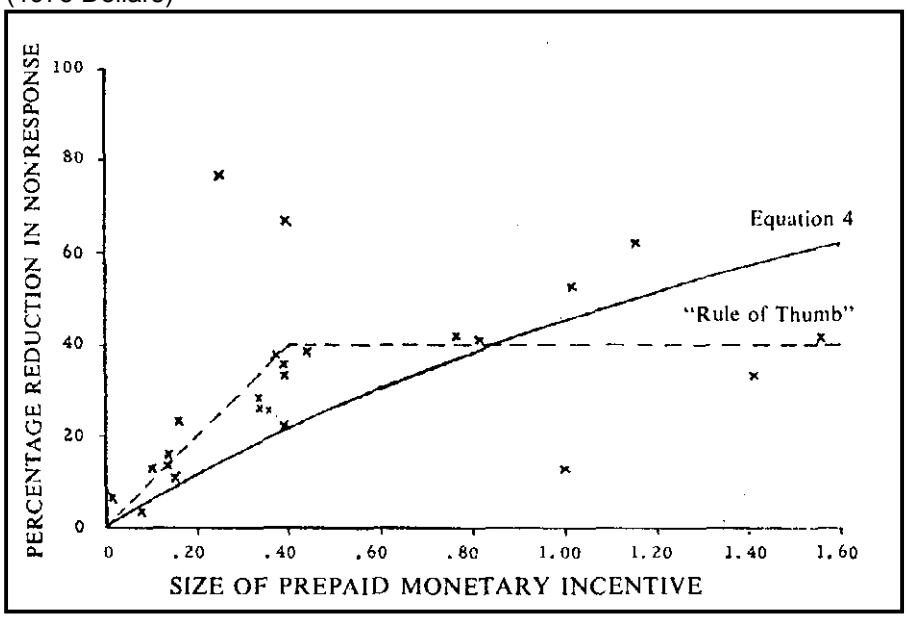
[5] Schuyler W. Huck and Edwin M. Gleason (1974), "Using monetary inducements to increase response rates from mail surveys," *Journal of Applied Psychology*, 59, 222-225 (2 waves).
[6] Newman, *op. cit.*. Table 1.
[7] The Consumer Price Index was obtained from the *1973 Economic Report* of *the President,* and this was converted to a January I, 1973, base. The year prior to the publication dale was used as the year of the study unless information was available on the year in which the study was actually done. Exceptions were the Erdos study done in 1952, the other Erdos studies done in 1956, and the Armstrong and Overton study done in 1969, finally, the index from 1933 was used for the 1931 publication by Shuttleworth, *op. cit.,* Table 1.
[8] One rationale for trying to assess the relationship by using different studies was provided by Wiseman, whose study suggested that the various techniques used to reduce nonresponse bias operate independently of one another; Wiseman, F. (1973), "Factor interaction in mail survey response rates," *Journal of Marketing Research*, 10, 330-333.

3. There should be diminishing marginal returns: each additional amount of money should have less of an impact.
4. The relationship should be simple. For this reason, a relationship was selected that required the estimation of only one parameter.

**Figure 1**
**Percentage Reduction in Nonresponse vs. Prepaid Monetary Incentive**
(1973 Dollars)




One way to capture the above assumptions is to fit the data to the following functional form:

$$Y = a - \frac{a}{e^{bM}} \tag{1}$$

where

Y is the reduction in non-response rate
a is the asymptote
M is the monetary incentive in dollars, and
b is the parameter to be estimated.

This functional form may be transformed to:

$$\text{In (a) - In (a - Y) = bM} \tag{2}$$

Assuming an asymptote of 100-percent,

$$\text{In (100) - In (100 - Y) = bM} \tag{3}$$

The b was then estimated via regression analysis using the 24 observations to be 0.6 [missing footnote] Thus, the reduction in the percentage of nonresponse, R, can be predicted:

$$R = 100 - \frac{100}{e^{0.6M}} \tag{4}$$

The curve represented by Equation 4 is shown in Figure I. The adjusted $R^2$ between the predicted and actual figures for Y was only 0.13. The poor fit is due largely to the studies by Huck et al. and by Maloney. Also, the predictions obtained from the curve are lower than the actual reductions in non-response bias on 18 of the 24 observations. On the average, the curve underestimates by about eight percent. This conservative bias is especially true for "small" monetary incentives (those less than fifty cents).

While prepaid monetary incentives led to a reduction in the nonresponse rate in all 24 cases, and by almost one third on the average, the attempt to relate this reduction to the monetary incentive was rather unsatisfactory. The use of equation 4, along with an 8 percent compensation for bias, led to only a modest improvement over a model that assumed that an incentive of any size would reduce nonresponsc by the average of 32 percent. The mean absolute percentage error (MAPS) was 14.9 for the former method and 11.4 for the latter. This provided an index of predictive efficiency of about 23 percent.[9]

The evidence for the a priori assumptions behind equation 4 was not, of course, strong even though the data were consistent with the hypothesis that each increase in incentives leads to a reduction in nonresponse. Furthermore, Hackler and Bourgette speculated that very large incentives would lead to lower response rates.[10] By dropping this a priori assumption, it is possible to develop a simple rule of thumb that provides a better fit to the data: "There is a I percent decrease in the nonresponse rate for each one-cent increase in the prepaid incentive up to a maximum of 40 percent." This rule of thumb reduced the MAPE for the sample from 11.4 (with the curve) to 9.4. Compared to a prediction based solely on the sample mean, the index of predictive efficiency was 37 percent.

When will monetary incentives be most effective? In view of the wide and unexplained variations among the studies, it seems worthwhile to control for the design of the study and the target population. Certainly, more data of the type examined here would be useful. More useful, however, would be large-scale surveys, each examining (1) a large number of different incentives (e.g., 20 levels), and (2) a wide range of incentives (e.g., one cent to twenty dollars).

Another promising route would be to conduct in-depth studies on how these monetary incentives affect people. This might help determine which aspects of the survey design or the target population are important. For example, on the design question, it may be more effective to call the incentive an "honorarium" than a "payment."

## Summary

What have we learned after four decades of research on monetary incentives in mail surveys? The only type of monetary incentive that has an impact on the nonresponse rate is the *prepaid* monetary incentive (moderate support). The reductions in nonresponse are substantial. In this sample, there was a reduction of about one-third (very strong support). Also, we have learned that it is very difficult to quantify the relationship between size of incentive and reduction in nonresponse. A rule of thumb – that there is a 1 percent decrease in nonresponse rate for each one cent increase in the prepaid incentive up to 40 percent – seems to be of some help (moderate support). Finally, progress over the next four decades is likely to be minimal unless large-scale surveys and/or in-depth studies are directed at this issue.

[9] This index of predictive efficiency was calculated by dividing the improvement (3.5 in this case), by the total error using the sample mean only (14.9).
[10] Hackler and Bourrette, op. cit., Table 1.