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Direct Insurance Sales Using Microeconomics

Improving Solicitation Management: Marginal Costs and the Value of New Business

by Robert E. Winawer

Editor's note: The following continues Mr. Winawer's article first presented in the previous issue of NewsDirect.

Features...

SECTION 3: MANAGING MARGINAL COSTS WITHIN C-TO-P

Direct response insurance companies most often manage solicitations using C-to-P (Cost-to-Premium) as a risk/reward threshold. They typically segment consumers based on the most relevant characteristic of potential interest in purchasing insurance.[1] Companies will usually continue to mail offers to the members of a particular segment who have not purchased as long as the expected cost of the mailing is less than a threshold percent of anticipated issued and paid premium (i.e. C-to-P is less than a specified value).

However, Solicitation Management, or SM, can be applied in several different ways, each with distinct economic consequences. The three most important components that distinguish any SM program are:

1. Risk/reward threshold (C-to-P, VNB, or some other),
2. Aggregation of solicitations when making SM decisions, and
3. Inclusion of acquisition costs.

Deciding how to approach each component should be done with the company's ultimate goal of maximizing risk-adjusted profits in mind.

An alternative for the first component, which relates to profit measures, is deferred until Section 5. Until then, it is assumed that management has chosen C-to-P as the risk/reward threshold. Alternatives for the last two components are reviewed in this section. Regarding these choices, solicitations may be discontinued using one of four decision criteria describing both which solicitations and what expenses to consider when making a SM decision. The four decision criteria (DC) are:

- DC1 – Stop solicitations the first time that C-to-P including fixed costs is greater than the threshold.
- DC2 – Stop solicitations when the average C-to-P over all offers including fixed costs is greater than the threshold.
- DC3 – Stop solicitations when the average C-to-P over all offers including only marginal costs (i.e. without fixed costs) is greater than the threshold.
- DC4 – Stop solicitations when the C-to-P including only marginal costs for the last (least profitable) offer is greater than the threshold.

It will be shown that while using C-to-P as a risk/reward threshold DC4 produces the highest values for the asset share pricing measures that are used to derive the C-to-P thresholds. However, it will also be shown that maximizing these profit measures does not assure that the company's ultimate goal of maximizing risk-adjusted profits will be achieved.

Example 1, summarized in Table 1 on page four, applies each of the four

(continued on page 4)

1) In the case study the most relevant characteristic of potential interest in purchasing insurance is 'time since the name was acquired' because response rates to offers decrease dramatically as time passes.

decision criteria to the case study. As expected, the example demonstrates how using DC4, considering only expenses that are marginal to the decision at hand, produces higher profit margin and ROI than any other method.

employed, company management will maximize risk-adjusted profits only by chance.

Management must use VNB (Embedded Value of New Business) in their SM analysis rather than C-to-P thresholds to assure that risk-adjusted profit will be maximized.

TABLE 1: IMPROVING PROFIT MARGIN & ROI WITH MARGINAL COST BASIS DECISIONS
(SUMMARY OF EXAMPLE 1 RESULTS)

Decision Criteria	*Profit Margin*	*ROI*
DC1 – First Offer with Fixed Costs	Profits < $0 (N/A)	Profits < $0 (N/A)
DC2 – Average of All Offers with Fixed Costs	8.99%	19.94%
DC3 – Average of All Offers without Fixed Costs	8.99%	19.94%
DC4 – Last Offer without Fixed Costs	9.45%	21.33%

For this purpose, printing of the solicitation materials, postage, variable underwriting costs, and variable issue costs are the only costs considered marginal. The list of potential consumers has already been generated or procured. Therefore, list generation expenses are considered fixed when deciding whom to solicit. Allocated salaries and equipment costs are likewise considered fixed.

While profit margin and ROI are maximized in Example 1 by using marginal acquisition costs in the decision process (DC4), risk-adjusted profits are not. Table 2, shown below, shows that both DC2 and DC3 produce $266,876 more risk-adjusted profits than DC4, even though profit margin and ROI under DC4 are higher.

As Table 2 demonstrates, maximizing profit margin and ROI does not assure that risk-adjusted profits will be maximized. Therefore, as long as C-to-P thresholds that are based on profit margin and ROI are used, regardless of what decision criterion is SM using C-to-P thresholds does not maximize risk-adjusted profit because the thresholds themselves are not based on risk-adjusted profits. Also, as management refines their SM decisions by reviewing smaller segments of consumers at a time, other shortcomings of C-to-P thresholds, which have not yet been discussed, emerge. Thus, refining the C-to-P analysis is discussed in the next section. Section 5 then shows how VNB resolves all of C-to-P's shortcomings.

SECTION 4: REFINING C-TO-P

In this section it will be shown that refining the thresholds used to make decisions can improve results. SM decisions can be refined in two ways:

1. By making more refined estimates of the probability of closing each sale, and/or

TABLE 2: RISK-ADJUSTED PROFIT RESULTS COMPARED TO PROFIT MARGIN & ROI
(SUMMARY OF EXAMPLE 1 RESULTS)

Decision Criteria	*Profit Margin*	*ROI*	*Risk-Adjusted Profits*
DC1 – First Offer with Fixed Costs	Profits < $0 (N/A)	Profits < $0 (N/A)	($1,950,000)
DC2 – Average of All Offers with Fixed Costs	8.99%	19.94%	$1,939,523
DC3 – Average of All Offers without Fixed Costs	8.99%	19.94%	$1,939,523
DC4 – Last Offer without Fixed Costs	9.45%	21.33%	$1,672,647

2. By making more refined estimates of the profitability of each sale, with closing the sale considered as a given.

Several companies currently use database-marketing techniques, based on demographics and other relevant information, to make more precise estimates of the probability of closing each sale. However, SM may use this information only within the confines of nondiscrimination and relevant third party wishes. For example, a social club may make their list of members available to an insurer with the stipulation that all members must be offered insurance, regardless of profitability to the insurer. On the other hand, a company that generates its own list of prospective purchasers is free to mail offers only to people in specific geographic regions. Any refinements that are practical are helpful.

Few companies work as hard to refine their profitability estimates of each sale as they do to refine their probability estimates of closing each sale. This is unfortunate because refined profitability estimates may help the company in the long run just as much, if not more than probability estimates. Perhaps there is more focus on probability estimates because sales volume, "top-line", is more easily understood than profits, "bottom-line." It is the actuary's job to clearly communicate the importance of the "bottom-line" and how it is derived.[2]

In Example 1, the threshold C-to-P ratio (120 percent) is the same for any potential sale. The same C-to-P threshold applies regardless of age, sex or any other determinant of profitability. The only distinguishing characteristic of each potential sale used to make SM decisions is the time since the name was acquired, as this is the primary determinant of consumer response.

Example 2 is summarized in Table 3 below, which shows how refinement can be used to improve results over Example 1. Example 2 highlights age as the second most important indicator of response and sex as the most important determinant of profitability. In the case study, younger people are considerably less interested in this product, hence response rates are lower. For example, first solicitation response rates are 0.25 percent for age 50 compared to 0.40 percent for age 65. At the same time, women are far more profitable to the company because the mortality cost is lower than for men while premiums stay the same. A higher C-to-P threshold implies that the company deems the sale to be more profitable. At age 50, the male C-to-P threshold is only 98 percent whereas the female threshold is 137 percent. At age 65 the difference in C-to-P thresholds is even more dramatic because the cost of mortality is higher. The male threshold is 60 percent and the female threshold is 173 percent. The results of Example 2 show that making SM decisions with C-to-P thresholds based on refined estimates of both the probability of closing each sale (response rate) and the profitability of each sale (C-to-P threshold) produces higher profit margin and ROI than in Example 1. Coincidentally, risk-adjusted profits are also improved.

TABLE 3: IMPROVING PROFITS WITH REFINED DECISIONS
(SUMMARY OF EXAMPLE 2 RESULTS)

Decision Criteria	*Profit Margin*	*ROI*	*Risk-Adjusted Profits*
Unrefined	9.45%	21.33%	$1,672,647
Refined Based on Age & Sex	11.83%	31.89%	$2,414,131

When refining SM decisions in an actual business setting, management may wish to consider several variables that are relevant to probability of sale and several variables that determine profitability after sale. However, bringing in more information to make solicitation decisions is a balancing

(continued on page 6)

2) It will be show in Section 5 that it is easier to explain how the "bottom-line" is derived using VNB than it is using C-to-P.

act. Management must be able to distinguish reliably, for any variable considered, the probability or profitability of a successful sale. Both of these judgments are customarily based on experience data that may not have been retained. On the other hand, people with adequate mathematical training and computer skills can construct very intricate models that provide appropriately summarized data. If the data is available, there should be no apprehensions about using it in SM decision models.

In this section it has been demonstrated that, in Microeconomic terms, distinguishing sales based on relative profitability can bring direct response insurers closer to an appropriate definition of marginal revenue and marginal production costs. In lay terms, it has been shown that it pays to define more carefully to whom the company ought to sell. This is common sense. However, no matter how granular the SM decisions that are made, using a threshold in lieu of an appropriate definition of marginal revenue and production costs will remain an indirect and inefficient route toward the ultimate goal, i.e., maximizing risk-adjusted profits. The next section will provide an acceptable definition for marginal revenue and production costs, one that directly measures risk-adjusted profits. With this measure insurers are able to make more direct and efficient decisions.

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NTM Section News

Election Results

Congratulations to our newly elected NTM Council members: Christopher H. Hause, Brian L. Louth and Nancy A. Manning! We'd also like to express our gratitude to the outgoing Council members, Mike Fix, Howell Pugh and Mike Presley. Thank you for your outstanding contributions. Also, Rob Stone will be taking over the seat of Tom Bakos, as Tom takes on a new role on the Board of Governors.

Attention: Newsletter Distribution to Become Electronic Only

The September 2002 issue of *NewsDirect* is being published in keeping with previous policy; i.e., in paper and online forms.

Beginning with the 2003 editions, *NewsDirect* will be available electronically only. To access NewsDirect online, please visit *www.soa.org/sections/nonnew.html*.

Non-SOA Members Allowed Membership to NTM Section

At its May 7, 2002 conference call, the NTM Section Council approved changes to the section bylaws allowing section membership to non-SOA members. In June, these changes were approved by SOA's Board of Governors. Below is an excerpt of the pertinent sections of the revised bylaws:

"Full Membership in the section shall be available to all interested members of the Society. … Correspondent status, providing eligibility to attend and participate in selected section activities, and to receive all literature produced by the section shall be available to non-Society members with interests in areas relevant to the actuarial profession. Correspondents shall not be eligible for voting privileges or election to the section council. In the by-laws, 'members' shall refer to full members of the section, not correspondents of the section."

For additional information, please contact Mike Fix, section council chairman, at **mfix@state.nd.us**.