The Problem of Free Riding in Voluntary Generic Advertising: Parallelism and Possible Solutions from the Lab

Kent D. Messer, Harry M. Kaiser, and William D. Schulze

Producers of many commodities pay for generic advertising, which is a public good for producers and, in cases like healthy foods, enhances social welfare. Though most programs were initially funded through the Voluntary Contribution Mechanism, many became mandatory to mitigate free riding. This experimental research simulates key economic and psychological details of these programs and produces donation results strikingly similar to a historic example. Because mandatory programs may be declared unconstitutional, the Provision Point Mechanism is tested as an alternative. This research also shows that refund-by-request donation mechanisms establish a status quo of contributing and reduce free riding.

Key words: experimental economics, generic advertising, provision point, status quo bias, voluntary contributions.

Most agricultural commodities in the United States have programs assessing producers for generic advertising and promotion, a public good for producers. Examples of generic advertising campaigns include "Beef, It's What's For Dinner;" "Got Milk?;" "Dancing Raisins;" and "The Incredible Edible Egg." Designed to increase the overall market demand for firms within an industry, generic advertising and promotion programs are usually found in industries producing homogeneous commodities with little potential for product differentiation. In the United States, the budgets for these programs total more than $1 billion annually (Forker and Ward 1993). Originally, participation in many of these programs was voluntary, in that revenue came from donations from willing participants using a version of the Voluntary Contributions Mechanism (VCM). Consistent with theory and past experimentation, free riding increased dramatically over time as contributions decreased, thereby creating a significant policy problem for producers.

The eventual failure of the VCM to provide a sufficient level of support for generic advertising led many programs to hold referenda with relevant producers to establish mandatory programs. Consequently, nearly all programs in operation today are mandatory. However, the constitutionality of mandatory programs has been under attack with three cases heard by the U.S. Supreme Court in the last decade. These challenges have led to a variety of decisions handed down. In 1997, the Court ruled in *Glickman* v. *Wileman Brothers and Elliott, Inc.* that the California peaches, plums, and nectarines checkoff program did not violate the plaintiff's right to free speech since generic advertising was part of a larger set of regulations designed to help producers. In 2001, the Court ruled in *United States* v. *United Foods, Inc.* the mushroom checkoff program unconstitutional because it was a stand-alone checkoff advertising program and not part of a broader set of economic regulations. In 2004, three of the most successful and visible mandatory generic advertising programs—for beef, pork, and milk—were ruled unconstitutional by federal appeals courts. In 2005 in *Johanns* v. *Livestock Marketing Association, et al.*, the Court ruled the beef advertising checkoff program constitutional because the advertising was considered "government speech." Despite the recent ruling, these programs remain

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vulnerable to legal challenges on new grounds, such as arguments related to freedom of association (for a review, see Crespi and McEowen 2006).

One might question the social importance and magnitude of under-provision of advertising for generic commodities. However, contrast the public health impacts from the types of foods associated with the majority of branded advertising, such as soda, beer, chips, and candy, to the types of foods that now benefit from mandatory generic advertising, such as fruits, vegetables, nuts, chicken, pork, beef, and milk. Not only do the generic commodities comprise the key nutritional elements of the United States Department of Agriculture food pyramid but these commodities also tend to be low in fat and salt (in comparison to branded snack foods and restaurant meals) and represent the bulk of what might be called the components of a healthy diet. If generic advertising for agricultural commodities collapses because mandatory programs are declared unconstitutional, the "Dancing Raisins" will be gone and the vast majority of ads for snacks will be for chips, cookies, and candy. Given important health problems such as obesity, juvenile diabetes, and osteoporosis, the under-funding of generic commodity advertising has serious public health consequences.[1]

The purpose of this experimental study is to investigate the effectiveness of alternative mechanisms for voluntarily funding generic advertising. Four research questions are examined. First, to what extent can field conditions be replicated in a laboratory setting using student subjects? This experimental research attempts to capture the institutional details of the egg program from both an economic and a psychological perspective. This careful calibration allows for an assessment of the degree to which parallelism holds by testing whether an experiment can replicate actual field participation rates over time (rounds) in a voluntary contribution (assessment) program. While contribution similarities have been demonstrated between lab subjects and subjects recruited from the field (List 2004), these similarities were observed in situations that lacked key context effects such as communication and the donation mechanisms that occur in the real world. This parallelism question is important, because if parallelism holds, then the laboratory results for other funding mechanisms will have good predictive power for what might be observed in the field.

Second, are there viable voluntary mechanisms to replace the VCM or current mandatory ones? The dilemma is that mandatory programs generally are highly effective in generating positive net benefits to producers, but voluntary programs using the VCM have been plagued by free riding. One obvious alternative is the provision point mechanism (PPM), which has been shown to have desirable theoretical properties by Bagnoli and Lipman (1989) and has been tested extensively in the laboratory and in the field (Dawes et al. 1986; Isaac, Schmidtz, and Walker 1989; Bagnoli and McKee 1991; Marks and Croson 1998, 1999; Krishnamurthy 2001; Poe et al. 2002; Rondeau, Poe, and Schulze 2005). Under this mechanism, the commodity promotion program would still be voluntary but generic advertising would occur only if at least a certain percentage of producers (the provision point) made contributions to it. If the percentage of producers making contributions was less than the provision point, all participants would receive a complete refund (a money-back guarantee) and no advertising program would be implemented. In laboratory experiments as well as in the field, PPMs have been shown to significantly lessen free riding compared to voluntary contributions. Using the PPM for voluntary programs may be advantageous because this funding mechanism would not be subject to the current legal challenges and it could reduce the degree of free riding seen in previous voluntary programs.

The third and fourth questions are whether creating a status quo of giving significantly increases voluntary contributions for generic advertising in the VCM and PPM. Contributions to generic advertising programs have typically started at a much higher level than the traditional VCM. For example, producer contributions to fund the American Egg Board's generic advertising started at 90.7% in the first year of its voluntary program and declined to 49.0% after eleven years. This pattern is significantly higher than in public good economics experiments, where initial contributions are

[1] Another example of the social importance of generic advertising is in relation to generic drugs, which now receive little or no advertising. Insurance companies have faced stiff resistance to their efforts to get consumers to switch to generic drugs given the large-scale advertising programs for name-brand drugs. The Blue Cross and Blue Shield Association argue that the failure to advertise generic drugs at comparable levels results in the average name-brand drug costing consumers about three times the equivalent generic—a significant social cost, especially since generic drugs provide the same levels of health benefits.

usually around 50% and quickly decay over time, especially when the marginal per capita rate of return (MPCR) is significantly less than one (see, for instance, Isaac, Walker, and Thomas (1984); Andreoni (1988); Messer et al. (2007); and others described in Ledyard (1995)). It is possible that the relatively high contributions resulted from the peculiar version of the VCM used to fund generic advertising, where all producers were assessed a per unit amount on sales but producers could request their money back by submitting a refund application. The contextual shift of requiring a refund by request changes the status quo from not contributing, as in the standard VCM, to contributing. Status quo bias suggests that the contribution rate should be increased by this contextual shift since decision makers are reluctant to leave the status quo even in the face of economic incentives (Samuelson and Zeckhauser 1998; Kahneman, Knetsch, and Thaler, 1990, 1991). A number of additional studies have demonstrated status quo bias in insurance choice (Johnson et al. 1993), pension savings (Madrian and Shea 2001), Internet privacy (Johnson, Bellman, and Lohse 2002), and organ donation (Johnson and Goldstein 2003).

Three related studies have recently examined the viability of voluntary funding mechanisms for generic advertising. Messer, Schmit, and Kaiser (2005) used experiments to investigate various aspects of the PPM and generic advertising, including optimal provision point levels—from both a producer surplus and a contribution perspective—and the role of producer referenda in increasing voluntary contributions. Norwood et al. (2006) surveyed beef producers to examine the feasibility of using VCMs or PPMs to fund the beef checkoff program and argued that the PPM may be inefficient because whenever the provision-point threshold is not reached, all funds are returned to producers and no advertising occurs. Messer, Kaiser, and Poe (2007) examined whether option assurance in the form of a two-tiered threshold (a lower one for administration and a higher one for advertising) improved contributions and producer welfare in funding generic advertising. This article contributes to this literature by testing for parallelism between the field and laboratory, examining the role of status quo bias on voluntary contributions, and exploring how PPMs can improve funding for voluntary generic advertising programs.

A Model of Generic Advertising

To provide a basis for the experimental design, the standard theoretical model of voluntary contributions, which predicts free riding must be modified to account for the specific circumstances of generic advertising. Consider an industry with n firms, each of which produces q_i units of a commodity at cost $c_i(q_i)$, which increases at an increasing rate in q_i. For simplicity, consider the case where total demand, $Q_D(A)$, is perfectly price inelastic but is an increasing function of total industry advertising expenditures, A. This assumption is reasonable for agriculture. Industry advertising expenditures are the sum of the voluntary contributions for advertising, A_i, of the n firms so that

$$A = \sum_{i=1}^{n} A_i. \tag{1}$$

When industry price is P, profits for each firm can be defined as

$$\pi_i = P q_i - c_i(q_i) - A_i. \tag{2}$$

Assuming firms are price takers, which is reasonable for agricultural producers since this is generally considered one of the most competitive sectors, optimal firm quantity is determined by setting price equal to marginal cost:

$$c_i'(q_i) = P. \tag{3}$$

The individual firm will choose A_i so that

$$q_i(\partial P/\partial A_i) - 1 \leq 0. \tag{4}$$

Firms must perceive that advertising will raise price or they will have no incentive to contribute (firms assume that $\partial P/\partial A_i > 0$). To determine the magnitude of $\partial P/\partial A = \partial P/\partial A_i$, note that, in equilibrium, supply equals demand

$$Q_D(A) = \sum_{i=1}^{n} q_i \tag{5}$$

and that by totally differentiating (3) and (5) one obtains

$$\partial P/\partial A_i = Q_D' \Big/ \left(\sum_{i=1}^{n} 1 \Big/ c_i'' \right) > 0 \tag{6}$$

which is positive given our assumptions. However, the industry optimum is obtained by maximizing total industry profits, $\sum_{i=1}^{n} \pi_i$, and the condition for the optimal provision of generic advertising is

$$(7) \qquad \sum_{i=1}^{n} q_i(\partial P/\partial A_i) - 1 \leq 0.$$

So, in contrasting (4) and (7), it is apparent that the individual-firm condition for positive contributions implicitly sets the individual marginal benefit of an additional dollar of generic advertising equal to the cost, while the efficient industry condition sets the sum of the marginal benefits across all firms equal to the marginal cost. Thus, the result is the classic public good problem, which implies under-provision of the public good by individual firms.

When we define R as the marginal rate of return to generic advertising, then

$$(8) \qquad R = \sum_{i=1}^{n} q_i \partial P/\partial C_i$$

and, if firms are identical, the individual-firm condition for generic advertising reduces to

$$(9) \qquad R/n - 1 \leq 0.$$

A review of the studies that have estimated R reveals that R/n is always significantly less than one due to the large number of firms involved in the production of agricultural commodities (Alston et al. 2005). Therefore, provision of voluntary generic advertising using the VCM theoretically is unlikely.

Experimental Designs

To answer the research questions, four experimental designs were conducted where each session involved twenty subjects as producers of a fictitious commodity (table 1). Since ten sessions were run, 200 subjects participated in these experiments. Each session had up to four different treatments. Subjects were informed that the experiment would involve multiple treatments, but they were unaware of the specific instructions for each treatment as separate instructions were distributed prior to the start of each treatment.

Experimental Design I—Baseline

To familiarize subjects with the experiment's procedures, the first treatment of the experiment always consisted of five rounds and did not include the advertising program ($n = 200$). Subjects received written instructions and the administrator provided a verbal description of

Table 1. Experimental Designs and Research Questions, Number of Subjects

Experimental Designs	First Treatment	Second Treatment		Third Treatment	Fourth Treatment		
	No Program	VCM Refund	VCM Contribution	Mandatory Program	PPM Refund	PPM Contribution	VCM Refund
I. Baseline	80	80		80	80		
II. VCM versus PPM	40	40		40		40	
III. Status Quo Bias and the VCM	40		40				
IV. Status Quo Bias and the PPM	40	40		40		40	
Total	200	160	40	160	80	40	40

Research Designs	First Treatment	Second Treatment		Third Treatment	Fourth Treatment			
	No Program	VCM Refund	VCM Contribution	Mandatory Program	PPM Refund	PPM Contribution	VCM Refund	Total
#1. Parallelism		160						160
#2. VCM versus PPM					80		40	120
#3. Status Quo Bias and the VCM		160	40					200
#4. Status Quo Bias and the PPM					80	40		120

the experiment and answered any questions.[2] Subjects were randomly assigned to a computer equipped with a privacy shield that had a spreadsheet informing them of their costs for producing up to three units of the commodity. Producers' costs remained constant throughout the experiment. Each of the twenty producers had two units that cost the same ($1.00) and a more costly third unit. Producers incurred the cost of producing the units only if the units were sold. The cost of the third unit differed for each subject, ranging from $1.10 to $5.06, and, since demand was always greater than forty units, the cost of the third unit provided the relevant portion of the supply curve to determine the prices.[3] The inherent cost variation among producers created a setting where subjects had heterogeneous endowments and heterogeneous returns from the generic advertising.

Using Microsoft Excel spreadsheets programmed with Visual Basic for Applications, subjects submitted their offers to sell each of their three units to the experiment administrator. These offers were stored in an Access database. The administrative computer calculated the market price and the number of units sold by each subject. This information was also stored in the Access database. When notified by the administrator, the subjects retrieved this information and their spreadsheets calculated the profit in each round.

The administrator acted as the buyer in the market, where demand was stochastic and ranged from 40 to 46 units. The stochastic demand created price fluctuations that mimicked the volatility common in commodity prices over time. For each round, demand was determined by a subject drawing one ball, with replacement, from a bag containing sixteen labeled bingo balls. The number on the drawn ball was the number of units demanded in that round. The subjects were informed that the numbers on the balls were based on a triangular distribution where the average demand (43 units) was represented by four balls while the extremes (40 units and 46 units) were each represented by only one ball.

For simplicity, demand in the experiment was assumed to be perfectly price inelastic and the supply elasticity was set at 0.25. The assumption of perfectly inelastic demand is plausible, as previous estimated demand elasticities for many agricultural commodities have been quite inelastic. The own-price elasticity of supply of 0.25 is also in the range of estimates of the supply elasticities for agricultural commodities.

A uniform price (or Vickrey) auction determined the market price for each round by setting the price for all units sold at the *first rejected offer*. The uniform price auction is common in experimental settings because of its incentive-compatible characteristics, transparency, and ease of administration in empirical settings (Cox, Smith, and Walker 1985). For example, if demand is 43 units, the price for all units sold would be set by the offer for the 44th unit. Subjects were informed that, in a competitive situation such as this, it is in their best interest to submit bids equal to their costs because otherwise they might miss an opportunity to make a profitable trade.

To replicate the experience of the American Egg Board's advertising program, which was funded for eleven years (1977–87) using the VCM with a refund-by-request feature (hereafter referred to as VCM-Refund), the second treatment lasted eleven rounds. A total of 160 subjects participated in the VCM-Refund as the second treatment (table 1) and the contribution behavior addresses the first research question—whether the high level of contributions for generic advertising programs can be replicated in the laboratory.

To avoid potential impacts from subjects considering this to be a finite game, subjects were not told the total number of rounds of the experiment. The second treatment of the experiment was conducted in much the same way as the first. The primary difference was that producers in the second treatment were assessed at $0.25 for each unit sold and the assessments funded an advertising program that increased demand in the subsequent round. Subjects were informed not only that the advertising program "in previous experiments" had increased demand but also that the higher demand would result in higher prices and greater profits for producers. In fact, generic advertising programs traditionally inform producers of all the benefits of generic advertising prior to implementation of the program. Specifically, the advertising program increased the demand in the next round by $Q_{D\_\text{Increase}} = \frac{2}{3} * \sum_{i=1}^{n} A_i$ where A_i is the assessment collected for each subject, $i = 1, \ldots, 20$. The advertising program increased demand above

[2] Experiment instructions can be found in Messer, Kaiser, and Schulze (2007).

[3] The cost, assessment, and price parameters used in the experiment and the assumption that producers did not incur costs if their units were not sold were not designed to mimic every aspect of the egg market but instead sought to contextualize the producer's decision regarding whether to contribute to voluntary generic advertising programs.

the level determined by the draw of the bingo ball.[4] Subjects were informed of the expected price that would result from different amounts of assessments collected. The assessment rate and corresponding increase in expected price were set to parallel the high return on investment, roughly four to one, frequently found with generic commodity advertising. Thus the average MPCR in the experiment was 0.25. As previously discussed, in VCM settings where the MPCR is less than one, the Nash equilibrium for a subject is to request a refund of her assessment. Subjects always have the financial incentive to request a refund (free ride), as it would provide them with the highest possible earnings in any particular round.

To simulate the discussions among producers that typically occur in the referendum process related to generic advertising programs, subjects were given up to five minutes prior to the start of VCM to discuss the advertising program as a group. In these discussions (commonly referred to as "cheap talk") subjects were permitted to discuss only strategy regarding the advertising program and not price collusion. After the rounds began, subjects were not allowed to communicate with each other.

As with some historic generic advertising programs, subjects could request a refund of some or all of their assessments. To request a refund, subjects submitted, via instant messaging, a confidential one-sentence request stating the amount of the refund desired with a maximum refund of \$0.25 per unit of quantity sold. An example is "Subject #5 requests a refund of \$0.25 for Round Eight. Sincerely, Jane Doe." All refund requests were granted and refunds were added back to the subject's profits. In each round, the administrator announced the total assessments possible, the total assessments actually collected, and the corresponding increase in demand.

After participating in a voluntary program for eleven years, U.S. egg producers held a referendum in 1988 on whether to create a mandatory program or to have no program at all. Egg producers voted overwhelmingly in favor of a mandatory program (84% in support). To mimic this historical transition from a voluntary to a mandatory program, subjects were asked to vote on whether they wanted a mandatory program with no option of a refund or no advertising program and thus no assessments. Three of the experimental designs included the mandatory treatment and the total sample size was 160 (table 1).

If the subjects elected the mandatory program, then producers were assessed \$0.25 for every unit sold and the assessments were used to fund the advertising program. If the subjects elected the no-advertising-program option, then producers operated identically to the first treatment, which had no advertising program. Subjects were given up to five minutes to discuss the referendum with the entire group. A majority vote determined the outcome and producers went through five rounds. Subjects were informed that whatever assessments were collected in the last round of the third treatment affected demand in the first round of the fourth treatment.

After tabulating the confidential votes, the administrator announced the election results and directed the subjects to the treatment of their spreadsheet that corresponded to the election outcome. If the mandatory program was elected, then in each round the administrator announced the total assessments collected and the increase in demand, the market price, and the number of units sold. If no advertising program was elected, the administrator announced the market price and the number of units sold.

To simulate the potential transition that could result if a mandatory generic advertising program were replaced by a voluntary PPM funding mechanism, the fourth and final treatment was identical to the second treatment except that a PPM with a refund-by-request feature (referred to as PPM-Refund) was employed. In the PPM-Refund, subjects were assessed for each unit sold and could submit confidential requests for refunds of their assessments. However, in this treatment the advertising program was implemented only if at least 70% of the subjects *did not request* refunds.[5] If seven or more of the twenty subjects in each experimental session requested refunds, the advertising program was not implemented and all contributors received a complete refund of their assessments.

Note that the provision point of 70% was based on the *number of subjects* not requesting refunds instead of applying the provision point to the total possible contributions. The advantage of tying the provision point to the

[4] While initial demand is stochastic, the change in demand due to advertising is deterministic based on contributions.

[5] Previous research has shown that, in a PPM with refunds, a threshold of near 70% yields a good balance between high contributions and a high rate of achieving the threshold (for example, see Dawes et al. 1986).

number of subjects was its transparency since the number of subjects in the experiment remained constant while the total possible contributions could potentially change in each round. Additionally, for practical policy purposes, a PPM based on the percentage of producers participating would likely be preferred because it would be perceived as more democratic.

If the 70% provision point was met, the advertising program operated as described in the second treatment—the amount of money actually collected and the corresponding increase in demand were announced. In addition, the number of subjects in each round who did *not* request a refund was announced to the subjects. If the provision point was not met, the round operated identically to the first treatment without an advertising program and subjects were given the opportunity to reach the provision point in the subsequent round.

Experimental Design II—VCM versus PPM

To answer the second research question of whether a PPM can yield higher levels of voluntary contributions, 40 subjects participated in an experimental design that was identical to the Baseline design except that it repeated the VCM-Refund as the fourth treatment of the session. Consequently, the results from the VCM versus PPM design can be compared to the results of the 80 subjects who participated in the PPM-Refund as the fourth treatment in the Baseline design (table 1).

Experimental Design III—Status Quo Bias and the VCM

To determine whether status quo bias is a reliable source of increased contributions for the VCM, two sessions ($n = 40$) were conducted in which the second treatment involved a reversal of the status quo for the contributions. These results can then be compared to those from the 160 subjects who participated in the VCM-Refund as the second treatment of their session (table 1).

The Status Quo Bias and the VCM design exactly duplicated the first two treatments of the Baseline design except that the status quo of the donation was changed to not contributing rather than contributing. The design consisted of two treatments. The first treatment was five rounds without the advertising program. The second treatment was eleven rounds in which the funds for the advertising campaign were raised by contributions given by subjects (referred to as VCM-Contribution).[6] The subjects were not aware of the actual number of rounds in the second treatment of the experiment and none of the experiment parameters were changed. The written instructions were identical to those for the first two treatments of the Baseline design except that subjects were no longer automatically assessed for every unit sold and subsequently given the opportunity to request a refund of these assessments. Instead, subjects were given an opportunity to contribute up to twenty-five cents for each unit they sold. To make a contribution, subjects entered the amount into their spreadsheets and completed a one-sentence instant message stating their intents. A sample message is "Subject #5 contributes $0.25 for Round Eight. Sincerely, Jane Doe." All contributions were accepted and the amounts were deducted from the producer's profits.

Experimental Design IV—Status-Quo Bias and the PPM

The first three treatments of the Status Quo Bias and the PPM design were identical to the Baseline design. However, in the fourth treatment subjects were informed that the advertising campaign would be implemented only if 70% or more gave "complete contributions," where their contributions were the maximum possible of $0.25 for each unit sold (referred to as PPM-Contribution). This design mirrors the fourth treatment of the Baseline design (PPM-Refund), in which the advertising campaign was implemented if 70% or more of the subjects "*did not request a refund*" of any amount.

Results

The experiments were conducted at the Laboratory for Experimental Economics and Decision Research at Cornell University and the subjects were recruited from introductory economics courses. An exchange rate was employed such that subjects in all experiment designs earned, on average, $18 per hour. The results of the experiments are presented in

[6] Since experimental design III in table 1 had two treatments instead of four, each experimental session lasted approximately one hour instead of the two hours required for all four treatments. Thus, the expected hourly earnings for all experimental designs were equivalent.

the order of the research question that they address.

Research Question #1—Parallelism

The first treatment of all experimental designs allowed subjects to familiarize themselves with the experiment and gave them experience with the uniform price auction. Over these five rounds, subjects learned through experience that, in a competitive situation such as this, it was to their advantage to submit offers equal to cost.

The introduction of the advertising program in the second treatment increased subjects' earnings. However, earnings by round declined after the early rounds because of free riding on contributions for the advertising campaign. The most striking result is that the percentage of contributions to the advertising campaign in the lab paralleled the percentage of contributions to the American Egg Board's advertising program from 1977 through 1987 (figure 1). As previously discussed, the VCM-Refund treatment was replicated in several of the experimental designs in a manner that did not affect the incentive structure; therefore, for completeness, the data from 160 participants were used. In the first round, subjects gave 87.4% of the total possible to fund the advertising program. This percentage was statistically indistinguishable from the historic field result of 90.7% in the first year that the VCM with the refund-by-request feature was used ($\chi^2 = 0.07, p = 0.791$). In the experiments, the percentage of contributions gradually declined and by round eleven was only 45.9% of total possible assessments. Again, this decline was almost identical to the historical results, where 49% of the possible contributions to the advertising campaign were made by producers in 1987 ($X^2 = 0.15, p = 0.699$). Not surprisingly, the 41.5 percentage point drop in contributions between the first and eleventh rounds of

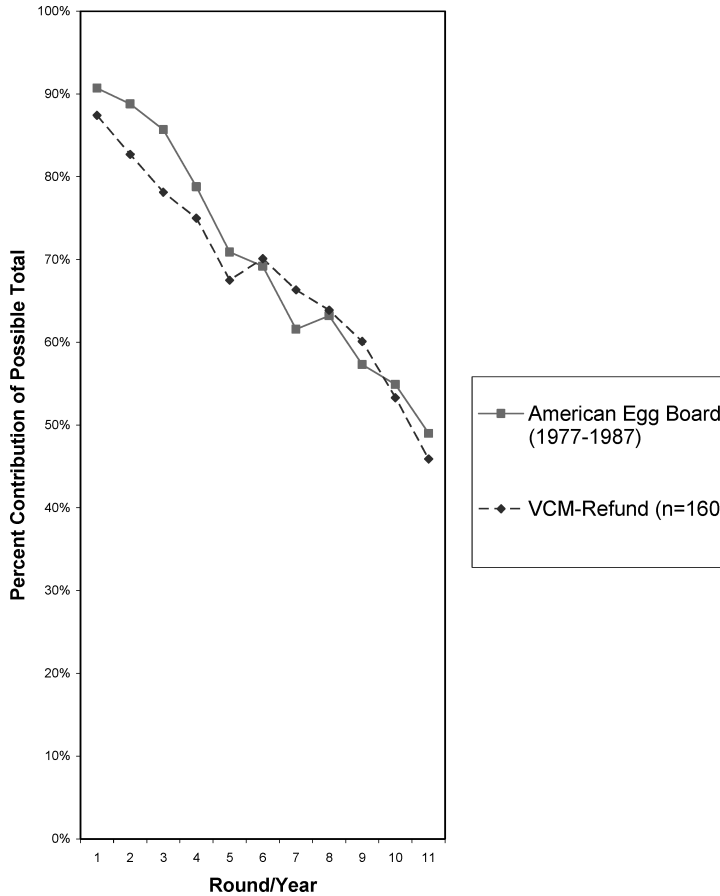

Figure 1. Percentage of total possible contributions: lab and field results

the VCM-Refund was highly significant ($\chi^2 = 11.98$, $p = 0.001$).

In all of the experimental designs that involved the mandatory program, subjects overwhelmingly voted to implement the advertising program with mandatory funding (no option of a refund request). On average, 94.4% of the subjects voted for the mandatory program, which is qualitatively similar to the landslide support by 84% of egg producers who voted in 1988 in favor of a mandatory program.

Research Question #2—VCM versus PPM

Given the high degree of parallelism obtained with these experimental designs, it is reasonable to address the second question regarding what type of program should replace the current mandatory one. As can be seen in figure 2, the percentages of contributions collected in the first rounds of the fourth treatment, whether it be the PPM-Refund or the VCM-Refund, were virtually identical. In the first round of the PPM-Refund, 83.6% of the possible money was contributed to the advertising campaign. This level of contribution was indistinguishable from the 82.8% of the total possible contribution going to the advertising campaign from the first round of the VCM-Refund as the fourth treatment ($\chi^2 = 0.01$, $p = 0.920$). Importantly, with the PPM-Refund there was no deterioration in contributions. By the eleventh round of the PPM-Refund, 79.6% of the total possible was contributed and this 4.0 percentage point change from the first round was not statistically significant ($\chi^2 = 0.01$, $p = 0.920$). In the VCM-Refund version of the fourth treatment, only 47.5% of the total possible was contributed, which was a statistically different result ($\chi^2 = 5.58$, $p = 0.018$).

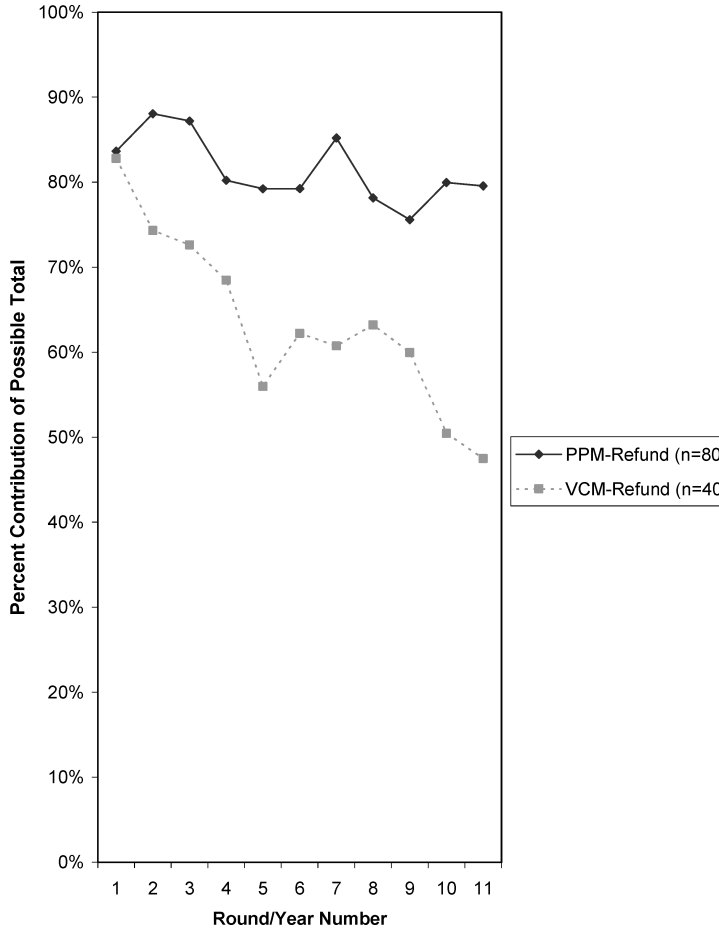

Figure 2. Percentage of total possible contributions in the fourth treatment: VCM-refund and PPM-refund

Thus, while initial contributions in the experiments are similar between the VCM-Refund and the PPM-Refund, the lack of decay in the PPM-Refund is critical for sustained high levels of support for generic advertising. The issue of how contribution behavior differs in multiple-round PPMs in contrast to multiple-round VCMs is not addressed in the surveys research by Norwood et al. (2006). Messer, Kaiser, and Poe (2007) tested various two-stage PPM designs that further improve efficiency and ensure the institutional viability of the generic advertising program in the event that contributions fall short of the PPM threshold in any one period.

Research Question #3—Status Quo Bias and the VCM

In the VCM, the change of status quo led to dramatically lower giving to the advertising campaign (figure 3). In the first round, only 50.0% of the total possible was actually contributed to the advertising campaign in the VCM-Contribution treatment compared to 87.4% from the VCM-Refund treatment. This 37.4 percentage point difference was statistically significant at the $\alpha = 0.01$ level ($\chi^2 = 14.35, p = 0.000$). By the eleventh round, subjects in the VCM-Contribution contributed only 15.1% of the total possible, which again was significantly lower than the 45.9% of the total possible contributed in the VCM-Refund ($\chi^2 = 5.53, p = 0.019$). Interestingly, the 34.9 percentage point drop in contributions in the VCM-Contribution was similar to that observed in the VCM-Refund, which had a 41.5 percentage point drop in contributions ($\chi^2 = 0.11, p = 0.740$).

Research Question #4—Status Quo Bias and the PPM

Similar to other experiments involving repeated PPM rounds (for example, see Isaac, Walker, and Thomas 1984; Isaac, Schmidtz,

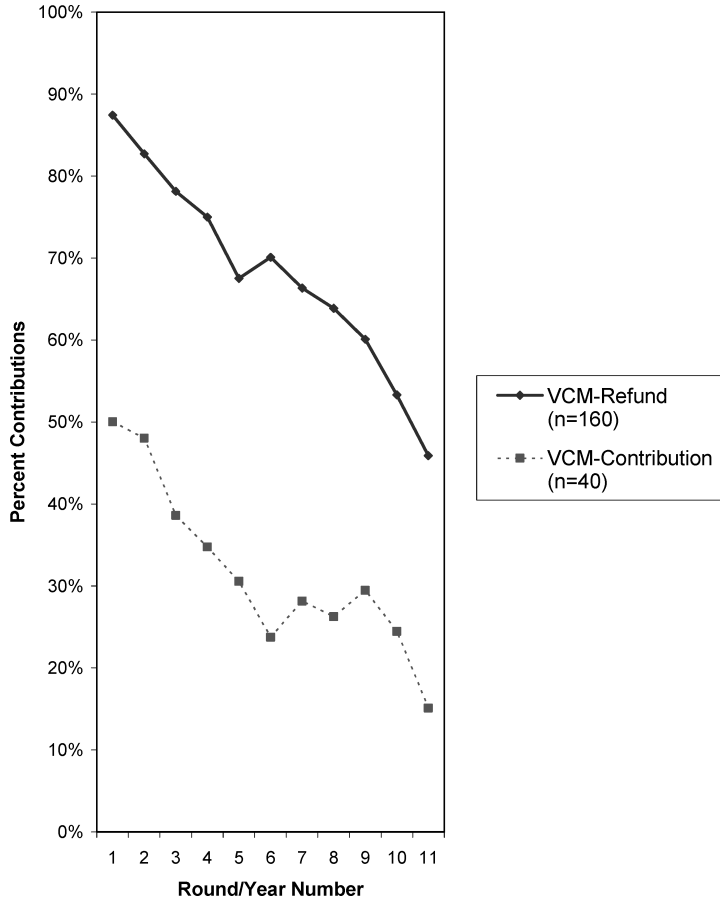

Figure 3. Percentage of total possible contributions in the second treatment: VCM-refund and VCM-contribution

and Walker 1989; and Marks and Croson 1998, 1999), subjects in our experiments did not always achieve the provision point. With the PPM-Refund, the provision point was achieved 90.9% of the time (40 out of 44), which was higher than the percentage achieved in most previous PPM research. For instance, Dawes et al. (1986) found that a 71% threshold was achieved only 65% of the time. Our experimental results suggest that the impact of status quo bias on the PPM also appears to be significant, though the effect is primarily focused on threshold achievement. In the PPM-Contribution, the threshold was achieved only 40.9% of the time ($\chi^2 = 5.66, p = 0.017$).

As seen in figure 4, the largest impact on total contributions was in the initial rounds. In the first round of the PPM-Contribution, subjects contributed just 67.3%. In contrast, subjects in the first round of the PPM-Refund contributed 83.6% of the total possible. This 16.3% difference was significant at the 0.05 level ($\chi^2 = 2.04, p = 0.042$). However, by the eleventh round this difference in contributions narrowed to 5.7% and was no longer statistically significant ($\chi^2 = 0.71, p = 0.480$) as subjects appear to be converging to the Nash equilibrium (to make "complete contributions" or "not to request refunds" 70% of the time). Bagnoli and Lipman (1989) have shown that any combination of contributions that equals the provision point is a Nash equilibrium (as is zero contributions) and that this result holds for a wide variety of threshold structures.

To summarize the results from the third and fourth research questions, a status quo of giving appears to significantly increase contributions in both the VCM and the PPM. The process of collecting assessments first and having producers request refunds later appears to establish a social norm, or reference point, that leads to higher levels of

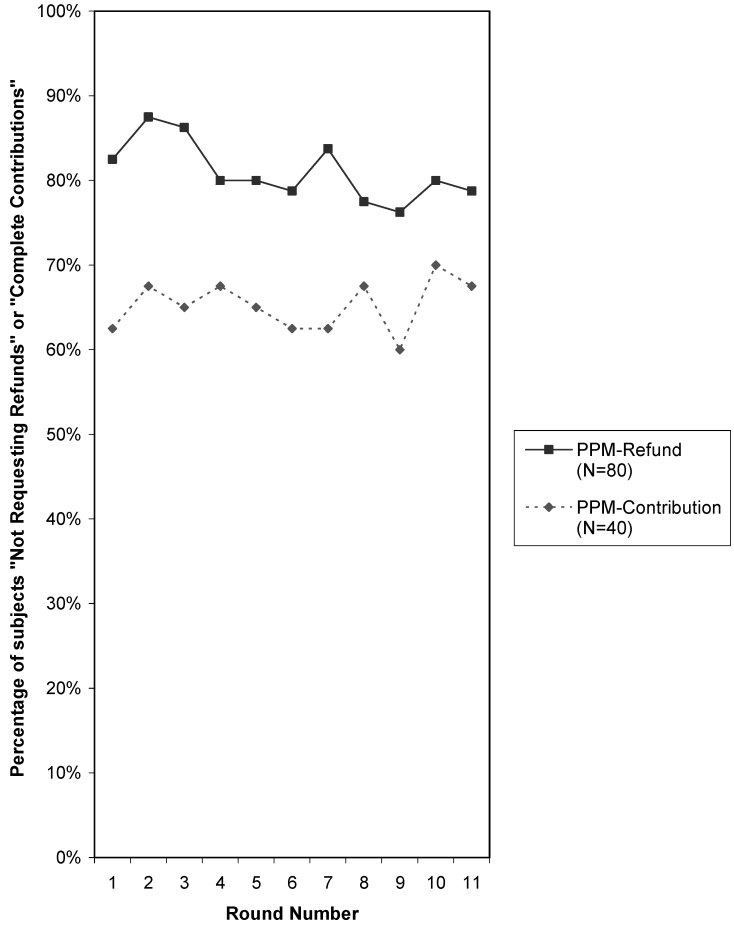

Figure 4. Percentage of "complete contributions" in PPM-contribution and "no refund request" in PPM-refund

contributions and is consistent with status quo bias. In addition, any transaction costs of withdrawing may support the status quo of giving. Thus, the efficiency of both the VCM and the PPM for generic advertising can be enhanced through status quo bias whenever establishing a status quo of contributing is feasible. However, it appears that the effect of a status quo of giving decreases over rounds since there still appears to be a convergence to the Nash equilibrium of zero contributions in the case of the VCM (albeit from a higher initial level) and to the particular Nash equilibrium of just covering the cost of the provision point in the PPM.

Conclusion

This article seeks to address the policy problems currently facing generic commodity advertising programs, programs that can have significant social welfare and public health benefits. While the U.S. Supreme Court ruled in 2006 that mandatory generic advertising programs are government speech and are thereby immune from free-speech challenges, these programs still face future legal challenges on other grounds, such as freedom of association, and remain vulnerable to future referendum challenges by dissenters in the industry. This research provides experimental evidence that voluntary programs with key institutional features such as a PPM and a status quo of contributing may be a viable alternative to mandatory checkoff programs.

Our experiments show that subjects' initial level and pattern of contributions parallel historical field data. The results over the eleven rounds of the VCM with a refund-by-request feature are strikingly similar to the high initial level of contributions and the pattern of deterioration in contributions observed in the field results for funding generic egg advertising for 1977 through 1987. This outcome suggests that if both the economic and the psychological contexts of decisions are carefully replicated, the laboratory can be used as an inexpensive way to test potential policy mechanisms.

It also appears that the version of the PPM we tested can yield far greater levels of contributions than the VCM for generic advertising in repeated settings, which is consistent with prior research. In the case of generic commodity advertising, the advantages of a PPM are twofold. First, it is voluntary and therefore avoids the legal challenges that mandatory programs currently face in U.S. courts. Second, the PPM in this setting has the potential for a high level of success since the 70% participation threshold was met more than 90% of the time. If parallelism holds, such programs are likely to be highly successful and popular since higher levels of funding for generic advertising can lead to higher demand, prices, and profits for producers.

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