



## Incidence, Equity, and Efficiency of Check-off Funded Research and Promotion Programs

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Agricultural commodity taxes, called “check-offs,” are used to finance promotion, research, and other activities that can be regarded as industry collective goods. Check-off programs are made possible by government policy through the application of the government’s coercive taxing powers to collect the check-offs, exemption of check-off programs from some anti-trust regulations, the use of government resources to develop and implement the programs, and, in some cases, the provision of government funds to support them. These programs are important in the United States, spending upwards of \$1 billion annually, and controversial, especially in relation to generic commodity promotion.

In recent years, several lawsuits have challenged the Constitutional legality of the mandatory check-offs, and two of the cases went as far as the U.S. Supreme Court. In 1997, the Supreme Court ruled in *Glickman v. Wileman Bros. & Elliott Inc.* that federally mandated generic advertising for California tree fruits did not violate the First Amendment; but in 2001, the Court ruled in *United Foods v. United States* that the Mushroom Promotion Act of 1990 did violate the First Amendment and should be struck down. The fact that at least some people affected by the

programs believe that they do not receive net benefits, even if there might be net benefits in aggregate, is reflected in these past challenges and the ongoing litigation and disputes.

Previous studies have examined the net producer benefits from check-off programs, but more recently attention has turned to some harder questions, such as: “How closely do program decisions correspond to those that would maximize total net benefits for society?” and “How are the benefits and costs distributed among different groups in society?” The two elements are related, since distributional impacts determine incentives.

Distributional issues associated with check-off programs can arise for a number of reasons and take several forms. Once a check-off program has been voted in by an appropriate majority of a defined group of producers, participation is mandatory for all producers in the group, even those who voted against it because they expected to be made worse off under the program. Further, both the collection of the check-offs and the programs they fund have implications for the welfare of consumers, other producers, and taxpayers in addition to their effects on the producers in the

group, covered by the programs. As well as simple fairness or equity considerations, any resulting mismatches of the distribution of the benefits and costs among different groups can lead to a divergence between producer and national optimal choices, and hence efficiency losses.

### 1. A Simple Model

A commodity-market model can be used to illustrate some key points about the final economic incidence (i.e., the ultimate distribution of the benefits and costs among different groups, after allowing for any induced price changes) of research, promotion, and the check-off used to finance them. In figure 1, suppose research causes the supply curve to shift down by  $k$  per unit, from  $S_0$  to  $S_1$ . A tax of  $k$  per unit, reflected as a shift in demand  $D_0$  to  $D_1$ , would exactly reverse the price, quantity, and economic welfare impacts of the parallel research-induced supply shift. Hence, if a  $k$  per unit tax could finance a research-induced supply shift of greater than  $k$  per unit, there would be net benefits to producers, consumers, and the nation as a whole. These net benefits would be shared in direct proportion to each group’s share of the costs, and so the research investment that would be

optimal for the nation as a whole would also be optimal for consumers and for producers. In this setting, if producers were empowered to set a check-off to fund research, their incentives to maximize their own benefits would be exactly compatible with the national interest.

Alternatively, if research causes a multiplicative (pivotal) supply shift, from  $S_0$  to  $S_2$ , the total research benefits are only roughly one-half of those from the parallel shift. The consumer benefits are the same as from the corresponding parallel shift, while the producer benefits are smaller (and under certain market conditions, producer benefits could even be negative). In this setting, consumers would receive more than their “fair” (i.e., proportionate) share of benefits, whilst producers would receive less than their “fair” share of benefits and would therefore opt to fund less than the national optimum quantity of research. Thus, the nature of the research-induced supply shift is an important determinant of the distribution of benefits relative to costs and the compatibility of producer group incentives and the national interest.

The same model can be used to consider the impacts of check-off funded promotion (or processing research that increases the demand for farm outputs), by interpreting  $S_0$  and  $S_1$  as the supply curves with and without the collection of a check-off, and  $D_0$  and  $D_1$  as the demand curves with and without the effects of promotion (or processing research) funded by the check-off. To do this we assume that the consumer benefits from

promotion, as from processing research, can be reasonably approximated using changes in the areas behind the relevant demand curves. Given this assumption, the incidence of a parallel increase in demand is identical to that of a check-off. In this setting a check-off is fair, in the sense that program benefits are distributed in proportion to costs of the check-off, and efficient, in the sense that the producer optimum coincides with the national optimum. As in the case of the research-induced supply shift, however, if the promotion expenditure results in a non-parallel shift in demand, the benefits would no longer be distributed in proportion to the costs. For a pivotal shift, producers would receive more than their “fair” share of the benefits, creating an incentive to set a higher check-off rate and do more promotion than the quantity that would maximize national net benefits.

## 2. Extension to the Model

The model in figure 1 assumes an undistorted market. Various studies have shown how the total benefits from research or promotion and their distribution between producers, consumers, and others will be affected by market distortions resulting from farm commodity programs, environmental externalities, or the exercise of market power by agribusiness firms. In many situations market distortions do not affect the total benefits, but do change the distribution of benefits from research or promotion, creating a divergence between producer and

national incentives. In extreme cases, distortions may be primary factors. For instance, each U.S. state would be a price taker in the domestic and international markets if we had free trade in milk and dairy products, and milk promotion under state orders could not be profitable for producers under those circumstances. Profitable promotion is made possible by the existence of trade barriers that allow markets to be separated both geopolitically and by end-use, but producer profits in this setting might come partly or entirely at the expense of consumers, taxpayers, or both.

Some further distributional issues arise when we partition the total net benefits “vertically” into elements accruing to final consumers, market intermediaries, farmers, and suppliers of agribusiness inputs. Unless inputs are used in fixed proportions, a levy collected at one stage of production has a different incidence from a parallel supply or demand shift at another stage of production, and farmers will pay more than their “fair” share of a check-off collected on a farm product and used to fund research or promotion that causes a parallel shift at a different stage of production. Alternatively, check-off funded research might give rise to nonparallel shifts or factor-biased technical change from which farmers may receive more or less than their fair share of the benefits, depending on the direction of the bias. For these reasons, a producer group might choose a different mixture of spending among different types of research and promotion, and a different total amount of spending, than the mixture and total

that would maximize total net benefits for society.

We can also disaggregate benefits and costs “horizontally,” among producers of the same commodity, who might not all be covered by a check-off program. For instance, those producers who do not adopt the new technology resulting from check-off funded research will not benefit but they will help pay for the research; and they may lose even more, if the research results in a lower price for their product. Similarly, commodities differentiated in space, time, and form, mean that the impacts of promotion may vary among producers covered by a program, according to the quality of their product, and when, where, and how it is sold, depending on the nature and timing of promotional effort. It is easy to imagine a case where check-off funded promotion enhances demand for one market segment at the expense of another. In some programs, considerations of distributional impacts across heterogeneous producers might give rise to a sacrifice of efficiency for equity in the choice of the mix of research and promotion programs (i.e., accepting a lower total benefit in exchange for a more equitable distribution of benefits).

A related issue is the distribution of benefits and costs among producers of different commodities. In some cases the different commodities may be covered by a single check-off program (as in the California Tree Fruit Agreement, covering peaches, plums, and nectarines) and in some other cases by competing programs (as in the beef and pork industries); and in other cases again, some commodities may be covered while others are not (e.g., comparing poultry versus red

meat). In any of these instances, cross-commodity impacts imply divergences between the incidence of costs of a check-off and the benefits from research or promotion, and incentives of managers of check-off funds will diverge from the interests of the broader society. In previous work we suggested that beggar-thy-neighbor elements could lead to excessive investments in generic commodity promotion. Similar results might be expected when R&D has a beggar-thy-neighbor element, whilst the converse will be found in the case of positive technology spillovers from one commodity group to others.

### 3. Conclusion

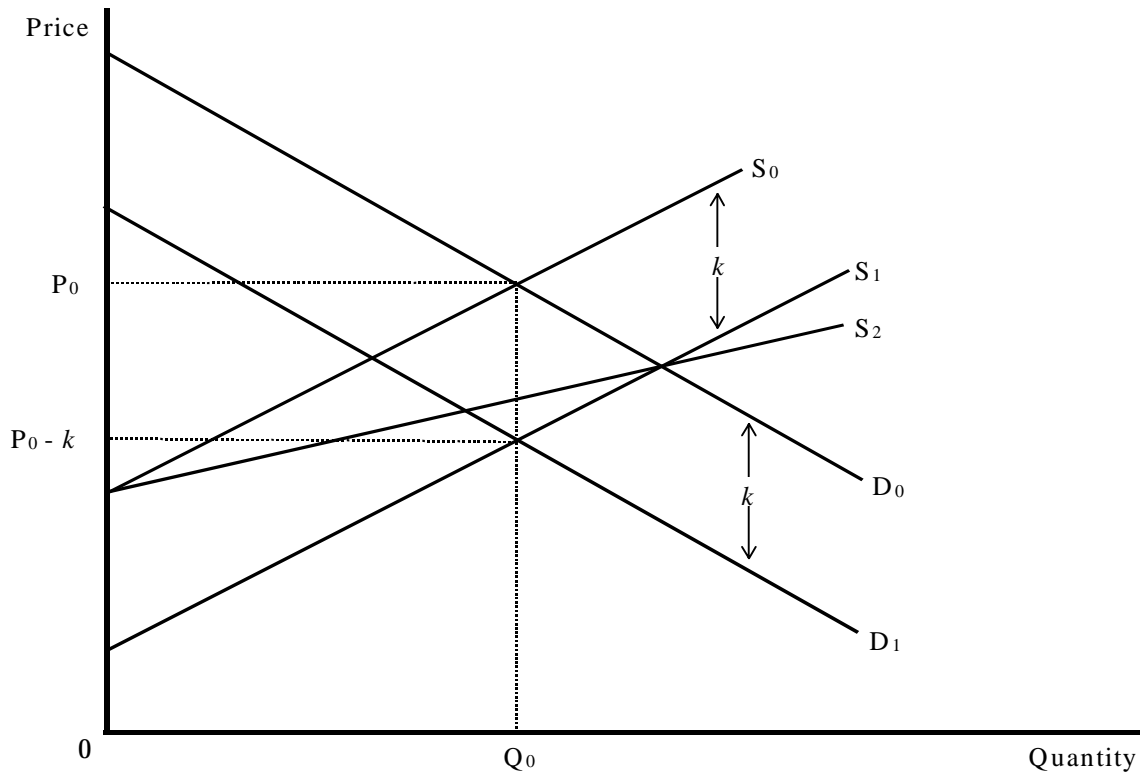
Commodity check-off programs have implications for the welfare of consumers, producers, and taxpayers in addition to their effects on those producers who are allowed to vote on the programs. The distributional outcomes have implications for both fairness and efficiency. If the producer group that comprises the constituency of the check-off program bears a larger (smaller) share of the costs than the benefits from a check-off funded activity, then the check-off program is likely to undersupply (oversupply) that activity from a national perspective.

The distribution of the benefits and costs of check-offs and check-off funded programs will coincide under some conditions but an exact coincidence seems unlikely. The distributional outcomes and their consequences are complicated and difficult to predict. Importantly, the producers’ share of program benefits depends crucially on the nature of the supply or demand shift induced by research or promotion, which is inherently difficult to

identify. Further, many commodity markets are distorted in ways that influence the distribution of the benefits from research or promotion. Finally, the distributions of costs and benefits may differ among producers of the same commodity or different commodities or across stages of a multistage production system, and this may have implications for the total funding raised using a check-off and how it is spent. Consequently, the incentives of producer groups might diverge significantly from national interests.

What are the public policy implications? We have identified many ways in which check-off programs might be expected to fail to achieve a hypothetical social optimum, but that is not a sufficient basis for criticizing or condemning the programs. The more relevant issue is whether check-off funded programs are better than a realistic alternative. One realistic alternative is a return to laissez faire and no programs; another is a modified check-off program. Producer groups can and should be expected to maximize their own benefits from check-off programs. The challenge, then, is to design the enabling legislation and operating rules so that producer and national interests more closely coincide, which cannot be done without considering the distributional issues discussed here. Even if the programs can be structured to assure compatibility with national interests, however, they may remain controversial if there are perceived distributional inequities or inefficiencies among producers within an industry, of the types that have led to the recent litigation over mandated generic promotion programs.

Figure 1. A Commodity Market Model of Check-off Funded Research and Promotion



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