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## R&D Versus Commodity Promotion: Budget Allocation Decisions by Agricultural Producer Associations

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### The Issue

Canadian agricultural producer associations generally promote a specific commodity on behalf of association members and conduct research in order to lower members' production costs and/or increase product quality. Commodity promotion and producer-sponsored research, both of which are typically funded by member levies, are subject to spillovers. For example, research funded by the British Columbia Blueberry Council typically benefits Washington State blueberry producers, and promotion schemes designed to increase North American consumption of blueberries produced in British Columbia typically also raise North American consumption of Washington State blueberries. Spillovers have important impacts on the optimal scale of commodity promotion and research activities by producer associations, and on the optimal allocation of levy funds between these two activities. Many policy makers understand that spillovers lead producer associations to under-invest in research, but it is less obvious that spillovers can also cause an association to redirect their levy funds toward commodity promotion and away from research.

### Policy Implications and Conclusions

Commodity promotion, such as print and television advertising, is designed to increase product demand. If promotion raises demand for both the targeted product and that sold by rivals, then the return from promotion is smaller and the investment in promotion activities will be less than if there are no

demand spillovers to rivals. Similarly, if producer-funded research and development (R&D) results in an innovation that reduces production costs of the targeted set of commodity producers, but rival blueberry producers adopt these cost-saving techniques at zero or low cost, then the return from R&D is smaller and the investment in R&D will be less than if there are no R&D spillovers. As a means of addressing the underinvestment impact of spillovers, producer associations often cooperate when making commodity promotion and R&D decisions, even though the associations remain direct competitors in product markets. Cooperation may take the form of jointly funded generic promotion and R&D programs or the sharing of innovation outcomes without licensing requirements and royalty payments when the R&D is successful. Producer associations typically find it easier and less costly to cooperate within a jointly funded commodity promotion program versus a jointly funded R&D program because of the inherent complexities in R&D contracting and a relatively high implicit cost of cheating by rival organizations within an R&D agreement. As a result, producer associations may find it more desirable to redirect levy funds toward commodity promotion programs and away from R&D programs. This reallocation of funds away from R&D further exacerbates an underinvestment in R&D that results from market spillovers. Policy makers should account for this incentive when designing R&D incentive schemes.

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## Discussion

R&D continues to have a high social rate of return in many agricultural markets (e.g., cereals and livestock). As supply chains in agricultural markets continue to grow in complexity, and intellectual property rights (IPRs) continue to strengthen, private sector research is becoming increasingly important and common. Although public and private research can achieve similar innovative outcomes, the distribution of the R&D surplus is quite different under the two regimes. Commodity producers are typically the direct recipients of R&D surplus in public research, whereas this group is a secondary beneficiary at best when large multinational input suppliers or commodity processors conduct R&D. The distribution of R&D gains is an important determinant of producer returns to R&D investment and the types of R&D projects that are undertaken. Policy makers would like to increase producer-funded R&D to raise the level of agricultural R&D, to provide commodity producers with a higher share of the R&D surplus, and to ensure that R&D project selection decisions are socially efficient.

To achieve producer-funded R&D, a producer association typically collects a levy/check-off from individual producers (usually when the commodity is sold), and then uses the collected funds to finance R&D projects. Producer associations also use member-collected funds to promote targeted commodities in domestic and global markets. Association managers should optimally allocate member-collected funds so that the marginal surplus from R&D spending is equal to the marginal surplus from commodity promotion spending. The free-rider problem implies that individual producers have little individual incentive to contribute toward either R&D or product promotion, so association managers typically specify a levy that must be paid by all members. Even if the levy is set at a level below that which is optimal for producers as a whole, a manager is still expected to efficiently allocate the association's budget to the dual activities of R&D and commodity promotion.

With strong intellectual property rights that eliminate R&D spillovers, and in the absence of free-riding by members, producer associations are expected to make efficient R&D decisions. Zero spillovers imply that an individual association is able to capture the

full amount of the R&D surplus, in which case the association does not have an incentive to under-invest in R&D. Surplus is generated for association members if the innovation lowers members' production costs and/or raises product quality. Surplus may also be generated if competing producers negotiate a license to use the innovation and thus provide the innovating firm with a stream of royalty payments. With strong IPRs and no spillovers, the R&D environment is non-cooperative because associations that operate in different jurisdictions (e.g., Canada and the U.S.) are not expected to participate in research joint ventures, share research findings, or coordinate R&D at any level. R&D cooperation is not expected in an environment of strong IPRs because the gain from deviating from a cooperative R&D agreement is large in comparison to the loss.

In reality, intellectual property rights in agricultural markets are often weak and demand spillovers are frequently quite large in magnitude. Consider the North American blueberry market, within which the British Columbia Blueberry Council and the Washington State Blueberry Commission operate. Cost-reducing innovations by the B.C. association will typically spill over to U.S. producers and vice versa because the innovations are usually of a type that formal IPRs are ineffective. Moreover, blueberry promotion by either Canadian or U.S. producer associations will typically raise demand for blueberries in general, which implies that demand spillovers are comparatively large. The direct impact of R&D and demand spillover is underinvestment in both R&D and commodity promotion by both producer associations. These underinvestment effects are well documented in the economics literature and are not the focus of this analysis. The focus here is on how R&D and demand spillovers can induce producer associations to redirect member-collected funds away from R&D projects and toward commodity promotion projects.

To understand why producer associations that face spillovers find it optimal to shift funds away from R&D and toward commodity promotion, it is necessary to first understand how spillovers change the incentives to cooperate with competing producer associations. Suppose that spillovers are large and producer associations choose not to cooperate. The producer associations will optimally shift the funds

toward the activity that has the smallest spillover. If demand spillovers are comparatively large because consumers do not differentiate between the commodities produced by the two competing associations, then in the absence of cooperation the associations should optimally redirect levy funds away from commodity promotion and toward R&D. On the other hand, if R&D spillovers are comparatively large because there is no mechanism for associations to protect intellectual property, then in the absence of cooperation the associations should optimally redirect member-collected funds away from R&D and toward commodity promotion.

Producer associations that face high spillovers have a strong incentive to cooperate when making R&D and commodity promotion decisions because cooperation is a natural market response to spillovers. Consider again the case of North American blueberries. If commodity promotion by either the Canadian or U.S. associations raises demand for blueberries in general, then clearly it is economically efficient for the two associations to jointly promote generic blueberries rather than have each association separately attempt to raise individual demand. Similarly, R&D cooperation (e.g., jointly funding blueberry research) will raise the level of R&D toward an efficient level and help eliminate wasteful R&D duplication. In the North American blueberries example, producer associations in Canada and the U.S. jointly fund the North American Blueberry Council, which currently represents about seventy percent of Canadian and U.S. blueberry producers. This cooperation occurs even though these associations are relatively fierce competitors in the North American blueberry market.

When producer associations choose to cooperate, each one will continue to allocate member-collected funds such that the marginal surplus arising from R&D is equal to the marginal surplus arising from commodity promotion. Through cooperation, shifting member-collected funds toward the activity with the lowest spillover is generally no longer optimal because cooperation can mostly eliminate the negative impact of the spillover. For example, commodity promotion may have a comparatively high spillover, and thus would receive a comparatively low fraction of levy funding in the absence of cooperation. However, if the associations choose to cooperate by launching

a generic promotion campaign, it may be that joint R&D is less efficient than joint commodity promotion, and so the association(s) will shift funds toward commodity promotion and away from R&D.

The above discussion implies that an association's degree of cooperation efficiency and cost of participating in a cooperative commodity promotion program relative to a cooperative R&D program is an important determinant as to how member-collected funds will be optimally allocated between R&D and commodity promotion activities. If cooperation in commodity promotion is relatively easy to achieve, and if cooperation in R&D is relatively hard to achieve, then levy funds will optimally be shifted toward commodity promotion activities and away from R&D activities. This outcome is expected for many real-world situations because transaction costs associated with maintaining a cooperative agreement will typically be relatively low for commodity promotion programs and relatively high for R&D programs. This is because a commodity promotion arrangement only requires agreement concerning the total amount to be spent on promotion, and how the association will share the aggregate promotion expense. Moreover, with commodity promotion, it is less likely that there will be specific events that will induce an association to cheat within the agreement. An R&D agreement, on the other hand, is more subject to cheating and would be relatively expensive to negotiate and maintain because R&D surplus is uncertain, asymmetric information distorts R&D intensity choices, licensing agreements must be negotiated, and the general features of such an agreement are much more complex than in a commodity agreement.