

Government Support of Agricultural R&D – A Policy Brief¹

Most economists believe that there are two primary reasons to intervene in the economy. The first reason is that you believe that intervention can improve the distribution of income (equity argument). The second reason is that intervention can improve the functioning of the market place by correcting a failure in the market's operation (efficiency argument).

Market failure provides a rationale for government involvement in agricultural research and development. In technical terms, market failure “occurs when market systematically and substantially fail to allocate resources to their most valuable use.”² There are several conditions that can result in market failure and for which government intervention may be appropriate: public goods, externalities, market power, and imperfect information.

Examples of **public goods** include Statistics Canada's free information regarding crop conditions and general extension services. The key features of public goods are that it is not possible to exclude people from consuming public goods and use by one person does not affect another's use. Because of these features, the private sector will not provide enough of these goods or services.

When the actions of someone impact others either negatively or positively, an **externality** occurs. Higher health care costs resulting from smoking or obesity are examples of a negative externality. The private sector will provide too little or too much of a good or service in the case of an externality.

When one component of a supply chain has **market power**, many governments put in place regulations to limit the power and increase competition. In agriculture for example, governments may put in place regulations to protect producers from trade practices by input suppliers.

When **asymmetric information** occurs, one party has more information than another. Producers know the quality of the food they have produced, for example, but consumers may not know the quality until they consume it or perhaps not at all. In the case of issues such as food borne illness, neither producers nor consumers know if a food is contaminated without testing. This is another type of information problem that may require government intervention.

When there is market failure, government intervention may improve market efficiency by reducing the costs associated with market exchanges (transaction costs). In agricultural R&D, there is more market failure in basic research than in applied or specific research where private firms can capture more benefits.

¹ This policy brief presents some key findings of “Policy Context & Rationale for Intervention in the Agri-Food Sector”, February 2011 by SJ Thompson and JS Clark. This paper was commissioned by the Canadian Agri-Food Policy Institute.

² Rama I and Harvey S, “Market Failure and Role of Government in Food Supply Chain”, Department of Primary Industry, Government of Victoria, June 2009.

In agricultural R&D, market failures may require the intervention of governments to deal with **knowledge spill overs** which occur when firms can't capture the full benefits of R&D. Property rights can help to correct this. While it is costly to generate knowledge, the incremental cost of diffusing knowledge tends to be low. The existence of spill overs provides a rationale for government intervention. Rama and Harvey argue that **the strongest cases for intervention occur in basic research “especially where most governance and funding mechanisms concentrate on the highest quality and most efficient diffusion practices” and “where businesses are engaged in novel R&D activities induced by support that either spill over cheaply to others or that trigger cycles of innovation by rivals”.**³

The **tax system** may serve as a disincentive for investment in R&D. Profit is taxed now but losses are carried forward. Past losses are lowered in subsequent years because of discounting. The disincentive to invest can be overcome by R&D tax offsets. Capital market failures may require government intervention. Risks associated with R&D, the lack of knowledge by the finance community, and difficulties in signalling the value of intangible assets such as R&D human capital may make it difficult to obtain financing. It may be inappropriate for the government to intervene if high transaction costs (financial firms may find it costly to deal with small risky firms) are responsible for the gaps in finance availability.⁴

One way governments attempt to overcome market failure in R&D is through the provision of **property rights**. However, this might not be enough to ensure the optimum amount of private sector investment. Malla and Gray suggest that the government may also have to subsidize the cost of the research or the cost of the output. The government must ensure that the intervention strikes the right balance. Excessive public investment could crowd out private R&D while overly restrictive intellectual property rights can prevent collaboration which hinders innovation.⁵

Market failure can be complex and does not always signal the need for government intervention. In order for government intervention to be justified, the benefits of intervention must exceed the costs and the opportunity cost of the intervention must be appropriate.⁶ Intervention is costly and so government policy should be delivered effectively and efficiently with consideration of the appropriate policy instrument and desired outcome.

There may also be some **non-economic arguments for government support of R&D**. Government support of R&D can be effective if R&D is an input into government activities such as defence and environmental issues. It is also possible that government support of R&D can be beneficial because it can provide a cultural statement about the society; increase national prestige; and meet national objectives.⁷

³ Australian Government, Productivity Commission, “Public Support for Science and Innovation”, March 2007.

⁴ Australian Government, Productivity Commission, “Public Support for Science and Innovation”, March 2007.

⁵ Malla S and R Gray, “Public Research Policy for Today's Agricultural Biotech Research Industry”, *Canadian Journal of Agricultural Economics*, Volume 51, 2003.

⁶ Rama I and Harvey S, “Market Failure and Role of Government in Food Supply Chain”, Department of Primary Industry, Government of Victoria, June 2009.

⁷ Australian Government, Productivity Commission, “Public Support for Science and Innovation”, March 2007.