

GMOs: Economics & Acceptability



Genetically modified organisms (GMOs) are developed in a process that splices the genes of one organism and then inserts them into another organism. It is believed that genetic modification can lead to more nutritious, durable, tasty and cheaper food (van den Bergh). GMOs are often created to resist disease, eliminate the need for pesticides, and achieve other desirable characteristics. For example, genes from cold-water fish can



be inserted into tomato plants to make them more tolerant to colder weather (Burkhardt).

The potential benefits of GMOs are countless, and to a large extent many of the production possibilities have been unrealized due to many of the hindrances arising from






ethical apprehension. Over the past decade or so, genetically modified organisms have become the subject of considerable public debate. Consumers around the world have exhibited a high level of concern regarding the safety of the food supply, and this has led






many of them to purchase only organically produced foods. This rapid expansion in the demand for organic foods, which saw sales shoot up 21 percent in 2006, can be attributed to the heightened concern surrounding the threats associated with the release of GMOs (Boston Globe).

The purpose of this paper is to address the ethical perspectives of economists, and how they relate to behavior regarding the production, consumption, marketing, and trade of GMOs. The main focus of attention will be on the use of genetically modified organisms, in particular transgenic plants. I will take a critical look at a particular economic study put forth to assess the economic impacts of releasing genetically


modified cotton. I will then look at it from the perspective of all the actors involved, including but not limited to, large corporations, activist groups, small farmers, governments, and consumers. I then attempt to exhibit the many forgone benefits of the technology, explaining why corporations and governments have been following a flawed strategy, leading to a lower degree of efficiency. Finally, I offer a few recommendations as to how governments, corporations, activist, environmentalist, and economists can all work together to devise a successful strategy.



When evaluating the cost and benefits of GMOs it is important to focus on the foundations of consumer behavior since economic outcomes are influenced by individuals' behaviors, which are themselves influenced by evolving social values and ethics (Braun 180). Economic models such as the rational choice model allow economist to look beyond profit maximization and consider  issues of ethical behavior. Nevertheless, much of economic theory has relied on the assumption that economic agents act in a rational manner and are guided by self-interest, with the objective to maximize their utility (Sen 1987). It is often the case that the influences of social institutions such as community, culture, and religion are not included as explanatory factors for human behavior (Gowdy  Walton 2003). Also, a great deal of the economic research concerning the release of GMOs has largely neglected the impact of factors such as  consumer knowledge, beliefs, and attitudes (Burkhardt). In order to make a proper economic assessment of the impacts of GMOs, a truly multidisciplinary evaluation required.

Back in 2004 a study was conducted observing the impacts of the world's top four GMO growing countries (USA, Argentina, Canada, and Brazil), which account for 94%

of the world's transgenic crop area (James, 2004). The evaluation of economic benefits focused on the increase in quantity and quality, reduced costs of production, and ultimately lower prices of agricultural products. The study examined a genetically modified crop of cotton that produces its own toxin to ward off unwanted pests. The results of the study showed that the genetically modified crops of cotton had higher effective yields, were more profitable, and saved on pesticide expenditures (Traxler 50). For this study the economists estimated the cost saving benefits at the farm level and entered them into a supply and demand model of world cotton in order to calculate the benefits. The model suggests that the new technology would reduce the cost of production allowing farmers to expand supply. The reduced costs and expansion of supply would lead to lower prices which may in turn increase the consumer's demand for cotton. All of these changes in cost, supply, price, and demand are calculated into the benefits. In this economic assessment, the assumption was made that consumers would be indifferent between bundles of conventionally produced cotton, versus bundles of  genetically produced cotton. Although this allowed economists to isolate the price effects of improved production techniques, it was only done so at the expense of excluding the  ethical considerations that consumers may have. 

Since it was assumed that consumers would be indifferent between the two bundles, producers concentrated solely on productivity and efficiency gains when calculating their profitability expectations. According to an USDA survey (1997), "the majority of farmers (50 to 75%) cited increase in yield as the first reason for adoption". This led them to make improper evaluations since it is often the case that consumers are not indifferent between GM and non-GM produced goods. The approach taken by the


economists in this study have been entirely supply-side oriented, neglecting ethical concerns that may have an adverse effect on demand. When assessing the profitability and economic impact of GMOs, the developments in supply and demand must be considered together (EC). By not taking this aspect into account large corporations are making enormous un-hedged bets when they invest in the research and development of new technologies.  Because consumer reluctance toward GMOs can have large effects on the economic valuation of such innovations, as well as on the distribution of the associated costs and benefits therefore, it is essential that consumer preferences towards GM products be considered in more depth.

Author Jeremy Rifkin predicted that GMOs would turn out to be “the single greatest failure in the history of capitalism” (Hindo). The powerhouse of the GMO industry, Monsanto learned the hard way when in fiscal year 2002 the company had lost \$1.7 billion. Monsanto altered its strategy to focus exclusively on seeds for agribusiness, ones that produced such goods as animal feed ethanol, and corn syrup. Monsanto found that seeds for produce that were destined directly for the dinner plate were not making their way through the wall of opposition. The failure to work collectively with governments and activist communities to promote a safe product image, has led to  widespread avoidance of GM products. To a large extent, the benefits of GM technologies are being wasted due to the misrepresentation of GM products.  Even though, many of the writings of activist groups are dominated by emotional considerations and often lack hard scientific facts, they have caused the removal of many GM products from store shelves.

Margaret Mellon, of the Union of Concerned Scientists and many of her peers have come to the conclusion that currently available GMO seeds are probably safe to eat, however, there still remains widespread skepticism. There needs to be more rigorous testing and the results need to be presented to the public in a manner that reduces this fear of the unknown. The leaders in the agribusiness industry can benefit by looking at the situation from an ethical perspective, this way they can develop ways to increase the global acceptance. More than 35 countries around the world, including the entire European Union, have taken steps to restrict the growing and importation of GE crops, and require labeling of all foods with genetically engineered ingredients. Had Monsanto included consumers into the equation when introducing their technology they could have avoided much of the turmoil that has engulfed this technology around the world (Mieszkowski). The GMO proponents have failed to develop the kind of information that they might use to counter the claims of their critics allowing the “scare tactics” and “Chicken Little theatrics” to remain formidable (Hindo).

There are potentially large societal benefits with genetic modification that may not be realized, or may only be realized at a large cost to society. For example, “an extremely efficient commodity-based system for the provision of basic food ingredients may need to be replaced by a new marketing system characterized by product segregation and identity preservation” (Moschini 112). Another issue of concern is the ability of the market system to handle the new risks that some people associate with GMOs. Private firms are obviously not well positioned to achieve this, not only because the lack of public trust but also because it is hard for them to internalize a cost for which there is no

market transaction. According to professor GianCarlo Moschini from Iowa State University, “it is crucial to have an effective regulatory system, capable of providing a transparent, objective, and credible institutional framework for GMO innovations to take place” (Moschini 112).

In conclusion, an economist tends to evaluate the impact of releasing GMOs from the various supply-side effects relating to increased efficiency and productivity. In the majority of studies  came across, consumers were largely left out of the equation since they were assumed to be indifferent between a bundle of GM products and non-GM products. Based on this assumption, it was believed that the rational consumer would desire more of each good at a lower price. This led many corporations to invest in research and development projects that were based on flawed assumptions.

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