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Will the Biosafety Protocol hinder or protect the developing world: Learning from China's experience

Jikun Huang [a,*], Deliang Zhang [a,b], Jun Yang [a], Scott Rozelle [c], Nicholas Kalaitzandonakes [d]

[a] Center for Chinese Agricultural Policy, Institute of Geographical Sciences and Natural Resource Research, Chinese Academy of Sciences, Jia 11 Datun Road, Anwai, Beijing 100101, China
[b] Graduate School, Chinese Academy of Sciences, China
[c] Department of Agricultural and Resource Economics, University of California, 1 Shields Avenue Davis, CA 95616, USA
[d] Economics and Management of Agrobiotechnology Center, University of Missouri-Columbia, USA

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Abstract

Uncertainties about the effect of Biosafety Protocol (BSP) on global agricultural trade have caused concern among those with a stake in agrifood imports and exports. The primary goal of this paper is to analyze the potential economic impacts of the BSP on both importing countries with a specific emphasis on China and exporting countries of soybean and maize. The results show that in absolute terms the BSP will require large investments internationally and will induce compliance costs. The BSP will increase the international price and domestic production in importing countries, and lower international trade and domestic production in the exporting countries. In absolute terms the impacts are large, amounting for each commodity into the tens of millions of dollars and varying largely among different scenarios. But in the percentage the impacts are small. Much smaller impacts are found in China because China has already invested in a system that provides almost all of the services that could be required by the BSP. Other developing nations may need more help; and that it will be more costly.

Keywords: LMO; Biosafety Protocol; Trade; Impact; China

Introduction

The Biosafety Protocol (BSP), a new international agreement that grew out of the Convention of Biological Diversity (CBD), entered into force in 2003. The main objective of the BSP is to contribute to the safe transfer across countries of living modified organisms (LMOs), which could be released into the environment and could affect the conservation and sustainability of biological diversity.[1] The BSP includes guidelines on how countries exporting LMOs need to document their presence and get a green light from importing countries through the use of "Advanced Informed Agreements." However, some of the proposed BSP provisions still lack details on how they are to be implemented in practice.

As countries continue to consider appropriate ways to implement the BSP's documentation requirements for shipments of LMOs, many questions remain about its potential economic impacts., The debate on such potential impacts has been particularly spirited in the case of LMOs intended for food, feed and processing (LMOs-FFP). Since most agricultural commodities around the world are produced and traded for food, feed and processing, biosafety labels for LMOs-FFP could prove costly and disruptive for world agricultural commodity trade (Kalaitzandonakes, 2004).

Uncertainties about the effect of the BSP on global agricultural trade have caused concern among those with a stake in agrifood imports and exports. The concerns about

* Corresponding author. Tel.: +86 10 64889440; fax: +86 10 64856533.
E-mail addresses: jkhuang.ccap@igsnrr.ac.cn (J. Huang), rozelle@primal.ucdavis.edu (S. Rozelle), Kalaitzandonakes@missouri.edu (N. Kalaitzandonakes).

[1] The term "living modified organisms" or LMOs is therefore similar to the term "genetically modified organisms" or GMOs. The major difference between LMOs and GMOs is that LMOs are capable of reproducing whereas GMOs may not if already processed.

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the economic impacts of the different ways to implement the BSP documentation requirements are rising from a number of countries, regardless whether they have or have not ratified BSP, and are particularly pertinent for developing countries that are large importers of agricultural commodities. Answers to the likely impacts of implementing the BSP are important not only for large countries that have the capacity to develop biotechnology products of their own, but also for smaller nations that do not have the capacity to develop either biotechnology products or effective biosafety regulatory systems.

Recently, in response to the demand for answers to these questions, research has begun on the costs associated with the implementation of the BSP. An International Food and Agricultural Trade Policy Council (IPC) technical brief authored by Kalaitzandonakes (2004) documented in a detailed way some of the potential costs and benefits of the BSP. The report—which is based mostly on empirical work in the US, a major exporter—shows that compliance costs could be significant and distributed across the global food system. The report also proposes that a majority of the costs would likely be born by importing countries. However, the conclusions of the global impacts of BSP as well as its impacts on exporting countries from Kalaitzandonakes' study are based on qualitative conjecture. Indeed until now, there has not been any quantitative analysis of the various costs and benefits from implementing the BSP in importing countries and, more broadly, of its impacts on global agricultural commodity trade.

The primary goal of this study is to analyze the potential economic effects of alternative documentation requirements of the BSP for LMO-FFP shipments on both importing countries and exporting countries. We use China's experience in setting up and implementing a national biosafety regulation as a basis for our analysis. Our emphasis on China is, in part, motivated by the fact that over the last 15 years this country has developed its own biosafety regulation and monitoring system that includes many of the BSP labeling provisions providing real-world experience and data for our analysis. To limit the scope of our study, we restrict our analysis to two commodities: soybeans and maize. While not completely comprehensive, focusing on these two commodities is defensible because soybeans and maize account for more than 80% of global GM crop area (James, 2006) and a dominant share of all traded crops across the globe (Kalaitzandonakes, 2004). Moreover, the two crops are important commodities in China's agricultural trade basket. China imported more than 24 million metric tons of soybeans in 2005, most of them were genetically modified. China's soybean import activity also is important for world markets since China's share constitutes a large part of the world's traded soybean volume. In the case of maize China, at least in the short run, may be both an importer and exporter of maize. Such a set of dynamics provide some instructive contrasts in our analysis.

We also note that the economic impacts examined in this paper account for only certain dimensions of the potential compliance costs—the upfront costs associated with the establishment of a biosafety regulatory infrastructure; the operating costs of running it; the marginal costs of enforcing the BSP documentation disciplines for the shipment of biotech crops used in food, feed and processing. Other potential compliance costs include those associated with the implementation of the BSP disciplines in transboundary movements of research material and LMOs intended for release in the environment; and provisions on liability and redress.

To meet our goal, in the next section we briefly describe the evolution of the Biosafety Protocol and identify key issues related to the implementation of the BSP and its potential effects on trade. In the section "China's biosafety regulation", we review China's biosafety regulation and its overlap with the provisions of the BSP LMOs-FFP labeling requirements. In the section "The costs of testing LMOs: approach and baseline results", using figures from China's experience, we estimate the costs that the BSP will add to the *direct cost* of soybeans and maize as they travel across the globe under alternative documentation regimes. In the section "The impact analysis of BSP on China and the rest of the world using GTAP", we simulate the *fuller impacts* of the BSP on commodity prices, production, consumption and trade. Finally, in the section "The full impacts of the BSP" we conclude and draw conclusions on the potential impacts of the BSP on the world and on China.

The evolution of the Biosafety Protocol and key issues related to trade

The BSP emerged from the CBD which itself contains specific provisions on certain biotechnology products but also emphasized the need for a protocol to set out conditions for their safe transfer, handling and use (Mackenzie, 2003). In 1994, at the first CBD conference the parties to the convention authorized a series of meetings to consider the "need and modalities" for such a protocol. A draft of the Protocol was produced in February 1999 at a meeting held in Cartagena, Colombia and was adapted on January 29, 2000 in Montreal, Canada. On September 11, 2003, the BSP entered into force and as of November 2006, 136 countries had ratified it.

The BSP's stated objective is to contribute to the safe transfer, handling and use of all LMOs that could adversely affect the conservation and sustainability of biological diversity or pose risks to human health. The BSP defines LMOs as those living organisms (e.g. plants, trees and animals including fish) with novel genetic material introduced through the use of modern biotechnology (i.e. recombinant DNA and cell fusion techniques). Two types of LMO uses are the main focus of the BSP: intentional release to the environment; and the direct use for food, feed and processing. To ensure the safe transfer, handling and use of LMOs the Protocol includes several broad and cross-cutting provisions.