

Special Issue in Honor of Jimmye S. Hillman: Introduction

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In March 2013, the annual research conference for US Department of Agriculture multi-state research project NC-1034 (Impact Analyses and Decision Strategies for Agricultural Research) was held at the University of Arizona, Tucson. This special issue, in honor of Dr. Jimmye S. Hillman, contains a selection of articles based on conference papers as well as solicited pieces. At 91, Dr. Hillman is enjoying a second career as a poet, memoirist, and culinary essayist. In the field of agricultural economics, he is best known for his pioneering work in the study of technical (or non-tariff) barriers to trade in agriculture.

Technical barriers may be defined as restrictions other than traditional customs duties that distort international trade (Hillman, 1991). These may include quotas; import bans; health, sanitary, and environmental regulations; and product labeling requirements. As direct tariffs have been reduced or eliminated in many cases, these technical barriers have grown in relative importance. It is an old but persistent question whether many such barriers are serving as legitimate welfare-improving tools to correct various market failures or whether they are just disguised forms of protectionism (Johnson, Hillman, & Petrey, 2001).

Many problems and broad themes addressed in Hillman (1991) continue to be important in the era of biotechnology. Long ago, Dr. Hillman encouraged me to read *The Invisible Tariff* by Percy Bidwell (1939a), written for the Council on Foreign Relations in 1939. It is an interesting read, dealing with issues such as how trade policy does and should address issues such as labor conditions, invasive species, and species protection. The study illustrates that many controversial topics in our era of globalization were being thought about (at least by some) during the Franklin Roosevelt administration. Bidwell astutely emphasized the importance of fundamental biological linkages between food production, human health, and environmental health. While policy certainly had a role in furthering “biological protection,” Bidwell (1939b) also warned that “under the guise of biological protection, however, it is very easy to introduce economic protection” (p. 785).

Hillman (1991) highlighted that a defining feature of the post-World War II world economy was the prolifera-

tion of agricultural trade, new agricultural technologies, and new consumer food products:

“... [T]housands of new products have been produced and the form of the old products has changed. This has created the need for new standards, new health and safety regulations, and new control mechanisms. The international transfer of technology has also led to problems of economic adjustment” (p. 10).

Both the growth in agricultural products and technologies and the rapid increase in their movement across international borders outstripped the capacity of national and international institutions. Technical barriers to trade could then be seen to

“... reflect the seeming inability of man and his traditional institutions to adjust to new developments and new conditions” (p. 9).

Expanding on themes raised by Bidwell, Hillman (1991) emphasized the growing interaction of consumer food-safety concerns with international trade. While various rounds of the General Agreement on Trade and Tariffs (GATT) were venues where food-safety concerns were addressed, parallel venues included the agreements of the World Health Organization and the UN Food and Agricultural Organization. Thus, agreements and institutions that did not have a trade focus per se often affected matters of import to international trade. Hillman (1991, 1997) also identified the important role of science (including economic science) and scientific uncertainty in informing the design of sanitary and phytosanitary standards. We had entered a world of “mandated science” (Salter, Levy, & Leiss, 1988), where science was being called upon to “settle” disputes over the structure and function of consumer protection regulations.

In sum, one might group some “big themes” in Hillman’s research program as follows: (a) the globalization of food production and consumption, (b) the proliferation of new agricultural technologies and food products, (c) the fact that this proliferation has outstripped institu-

tional capacity to develop a consensus on environmental and human health standards, (d) the need for international institutions to achieve some form of harmonization or consensus with respect to health and safety standards, and (e) the role of science in informing trade policy and resolving trade disputes. Cutting across all these themes is the role of various and evolving interest groups engaged in rent seeking and other activities to influence policy outcomes. These themes remain pertinent in the era of biotechnology and the rise of global environmental concerns. Hillman saw the scope for the Convention on Biological Diversity to have major implications on international agricultural trade and technology transfer (Johnson et al., 2001). One can also see debates between North American and European countries over the application of the precautionary principle to biotechnology as a newer form of older fights in trans-Atlantic trade (Hillman, 1991, 1997; Johnson et al., 2001).

The Role of International Agreements and Institutions

A pervasive theme in Hillman's work is recognition that international agricultural trade is affected not only by international trade agreements, but also by other international agreements and institutions whose missions are to protect the environment or human health. The first article in this special issue, by Kerr et al., considers complications arising from the fact that the World Trade Organization (WTO) and the Cartagena Protocol on Biosafety (CPB) provide very different and often times conflicting sets of trade rules governing biological organisms. The Vienna Convention on the Law of Treaties was intended to provide guidance regarding the primacy between international agreements. Yet, Kerr et al. find that while the Vienna Convention may not directly solve trade disputes over biotechnology, it may prove useful to the WTO's dispute settlement mechanism (DSM). The authors argue that because most major exporters of genetically modified (GM) products do not belong to the CPB but most potential importers and exporters belong to the WTO, the WTO should be the venue where disputes are adjudicated. They argue that the WTO's well-regarded dispute settlement system's strong institutional capacity make it well suited to the task. Further, they note that the WTO's preamble contains language regarding sustainable development that goes beyond narrow trade-focused language of the WTO agreements. Dispute settlements considering this broader preambular language could go a long way to

consistently address many of the environmental concerns the CPB seeks to address.

The next article, by McClory and Kowalski, considers the scope of the Convention on Biological Diversity to provide incentives for the conservation and commercial application of horse genetic resources. These resources may provide valuable veterinary applications such as diagnostics, therapeutics, genetic markers, gene therapies, and cloning technologies. As biotechnology becomes increasingly sophisticated, it will facilitate identification, inventorying, bioprospecting, and commercialization of horse genetic information. Creating economic compensation schemes to promote conservation of horse populations remains a challenge, however. The authors recommend establishing competent national authorities (CNAs) with sufficient human resource and institutional capacity to catalogue horse genetic resource inventories, market and direct equitable value chains from horse to genetic information to commercial products, and ensure revenue flow back to support conservation.

Segregation and Labeling of GM Crops and Foods

In considering future developments in food production systems, Johnson et al. (2001, p. 16) noted that new types of food products would put "greater pressure on the marketing chain," and asked, "[w]hat do such developments mean for future organizational patterns of production, processing, and ancillary services?" The article by Varacca, Boccaletti, and Soregaroli considers such new organizational patterns in a study of the supply chain for non-GM soybeans. They explore linkages and contractual structures between Brazilian (and other foreign) producers, international trading companies, and Italian feed producers. Combining transactions cost economics with interviews of industry representatives, they explore how different types of uncertainty (about product quality and about environmental impacts), influence coordination arrangements and vertical integration in the supply chain.

Huffman and McCluskey consider the economics of labeling requirements for genetically modified food products. They note that the United States and European Union (EU) have addressed food safety and labeling issues regarding GM foods from quite different approaches, making compromise and harmonization difficult. In particular, the European emphasis on applying the precautionary principle to biotechnologies, mandatory labeling requirements, and product segregation

requirements certainly act as technical barriers to trade. Disputes over GM food labeling may be seen as the latest source of dispute between North American and European countries (Hillman, 1991; 1997). While food labels can be an important source of information about food attributes, economics and politics both play a large role in determining just what information is required on labels.

New Technologies in Southern Agriculture

The last two papers deal less with the trade-related themes that are the center of Dr. Hillman's research. They do, however, deal with new technologies in US Southern agriculture. Raised on a farm in Mississippi, this has been a topic of lifelong interest to Dr. Hillman. The article by Moss and Schmitz considers the role of biotechnology in aiding farmers in addressing drought. GM crops affect farm profits via two pathways. First, they can reduce risk or variation in production. Second, they can alter the relative productivity of inputs. The article examines the potential effect of these two pathways for hard red winter wheat production in Oklahoma. Moss and Schmitz examine the potential impact of a genetic innovation that increases the drought tolerance of winter wheat compared with an innovation that increases the efficiency of nitrogen use. They then consider effects of stacking these traits. They find that the possibility of stacked traits may enable breeders to tailor varieties to specific drought regions. The article by Hayes, Kostandini, and Jordan surveyed Southern tobacco farmers about their perceptions of biopharming—the cultivation of crops for a pharmaceutical purpose. This gives them the ability to produce therapeutic

proteins, which are then extracted, purified, and used by the pharmaceutical industry to produce large-molecule, protein-based drugs. While farmers had limited knowledge of biopharming, they appeared more knowledgeable the public in general. Most did not report concerns about risks associated with biopharming; willingness to grow biopharming crops depends largely on economic incentives. Given that some biopharming products are already making their way to the market, more efforts to increase farmers' knowledge of biopharming may help future interactions between farmers, policymakers concerned with biopharming regulations, and biopharmaceutical companies.

References

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