



AgEcon SEARCH
RESEARCH IN AGRICULTURAL & APPLIED ECONOMICS

The World's Largest Open Access Agricultural & Applied Economics Digital Library

This document is discoverable and free to researchers across the globe due to the work of AgEcon Search.

Help ensure our sustainability.

Give to AgEcon Search

AgEcon Search
<http://ageconsearch.umn.edu>
aesearch@umn.edu

*Papers downloaded from **AgEcon Search** may be used for non-commercial purposes and personal study only. No other use, including posting to another Internet site, is permitted without permission from the copyright owner (not AgEcon Search), or as allowed under the provisions of Fair Use, U.S. Copyright Act, Title 17 U.S.C.*

The Lack of Dynamic Gains from Trade in Agriculture: Implications for Governing Agricultural Trade

Wanki Moon
Department of Agribusiness Economics
Southern Illinois University
Carbondale, IL 62901
Email) wmoon@siu.edu

Abstract

Research has shown that agricultural trade is not poised to generate dynamic/productivity gains in contrast to the mounting evidence of such gains (in addition to the conventional static gains) in manufacturing. This paper interprets below the lack of the dynamic gains from trade in agriculture in order to provide further insights to better understanding the nature of the difficulty of liberalizing agricultural trade; proffer development strategies for food-importing low income countries; and suggest a new way of governing agricultural trade in the post-Doha Round era.

JEL Code: F1; Q12; Q16; Q17

Selected paper prepared for presentation at the Southern Agricultural Economics Association's 2018 Annual Meeting, Jacksonville, FL Feb 3-6 2018

Copyright 2018 by W. Moon. All rights reserved. Readers may make verbatim copies of this document for non-commercial purposes by any means, provided that this copyright notice appears on all such copies.

The Lack of Dynamic Gains from Trade in Agriculture: Implications for Governing Agricultural Trade

1. Introduction

Trade liberalization in agriculture has been one of the most contentious issues in international economic affairs over the last decades. Proponents argue that trade liberalization in agriculture would benefit the global economy by stimulating specialization of agricultural production across the world and results in substantial increases in national incomes and welfare for all countries involved. Opponents counter that international markets in agriculture are already distorted due to agricultural protection in developed countries and agricultural taxing in developing countries, and liberalizing is likely to fixate such distortions and deprive food insecure developing countries of the opportunity to advance their agricultural development. Proponents argue that states should stay out of the international flow of agricultural products, whereas opponents contending that states should play an important role in developing/managing the agricultural sector, especially in food-insecure developing and least developed countries.

In a recent paper, Moon and Pino (2017) shed light on the distinctiveness of agricultural trade by comparing the determinants of international competitiveness and the pattern of trade between agriculture and manufacturing. According to them, firm-level strategies/capabilities are the most crucial factor determining international competitiveness of their products and free trade in the manufacturing sector would bring about dynamic gains (in addition to the static gains) by promoting competition and triggering the Schumpeterian entrepreneurial innovations among firms around the world. In fact, in the real world, the international specialization of manufacturing firms around the world and horizontal and vertical global networks of production have been deepening (Baldwin, 2011), and more importantly, the firms are constantly pressured

to continue to improve their competitiveness so as not to be outcompeted by rival firms or by new entrants in international markets. In support of the positive role of competitive pressure, Rodrik (2012) shows that there is strong unconditional convergence in labor productivity in the manufacturing sectors across countries (but not in economies as a whole, agriculture or non-tradable service industries) and he cites the competitive environment of the international markets for manufactured goods and the need for firms to upgrade their operational efficiency constantly as the reasons underlying the convergence. Divergent from such a case of trade in manufacturing, Moon and Pino (2017) show that it is the state and the quality of inputs that would determine the pattern of trade and international competitiveness. Based on that, they make the proposition that there would not be as much dynamic gains from liberalizing agricultural trade as in manufacturing. The lack of the dynamic gains in their analysis is closely associated with the limited role (passivity) of farm producers in determining the productivity and international competitiveness of their commodities and consequent absence of the creative destruction process in agricultural production. They contend that the lack of the dynamic gains from trade in agricultural commodities should be recognized as one of economic features distinctive to agricultural industries such as inelastic demand/supply and consequent instability in prices and income, inelastic income elasticity, asset fixity and consequent irreversible supply function, and agriculture's structural decline in the process of economic development.

The main purpose of this paper is to interpret the lack of dynamic gains from trade in agriculture from the following three perspectives and discuss their implications: (i) the persistence of agricultural protection over a long period of time; (ii) agricultural/economic development strategies in food-insecure low-income countries; and (iii) the governance of agricultural trade in the post-Doha Round era.

2. The Rise and Growth of Agricultural Protection

Agriculture is probably the most prominent case of not embracing free trade policies in the postwar period. Do any of the theories reviewed in the previous section provide good explanations for the persistence and spread of agricultural protectionism? Probably no. Albeit number of reasons were proposed, the phenomenon of agricultural protection is simply too puzzling for many economists to grasp it.¹ As such, the distortions in international agricultural markets due to agricultural protectionism have been an intriguing issue in the academics in for long time (Anderson, 2010; Anderson, Rausser, and Swinnen, 2013).

Since the Corn Laws and Navigations Acts were repealed in the late 1840s, British along with others such as Denmark and Netherlands have been moving toward free trade in agriculture, although other parts of the Europe (France and Germany) keeping protectionist position all along (McCalla, 1969). Yet, when agricultural depression set in with greatly expanded production of wheat and livestock from the New World (American, Australia, and Canada) being put in European markets in the 1860s, British turned around and started to protect its agricultural interests again. After the First World War, the pursuit of agricultural self-sufficiency in Europe depressed agricultural commodity prices and farmers' income, which directly underlie the birth of today's agricultural protectionism. Especially, during the Great Depression era, the governments in the U.S. and Europe needed to protect the one-fourth of the population engaged in farming and reduce the disparity in incomes between the farm and non-farm sectors,

¹ Agricultural protectionism has been extensively researched over the last five decades and the literature identify a number of reasons for its rise and persistence ranging from microeconomic (farm income boost; income/price stabilization); developmental; political economy (domestic politics involving bureaucrats/politicians/farm organizations' pursuit of self-interest), environmental/ecological services; sociological (rural community vitality); ethical (equity between rural and urban). Food security, the most frequently cited reason for protecting the agricultural sector, is multifaceted being inclusive of be economic, developmental, political, sociological, anthropological, human rights, and environmental.

expanding the range of policy instruments.² France, Germany, and eventually Britain adopted the old version of today's farm policies by the 1930s. For example, Britain instituted a set of laws (Wheat Act of 1932; Agricultural Act of 1937; Livestock Industry Act of 1937) to place agriculture under a system of price support and import management. In the US, Agricultural Adjustment Act (AAA) was enacted in 1933 as the first purely domestic as opposed to trade policy for agriculture. The AAA initiated the concept of supply management with two primary instruments: price supports and production controls. Farmers were required to restrict their production of certain crops in order to be eligible for price supports setting artificially high prices.

The Bretton Woods system created in 1945 was given the mission of fostering growth and stability through progressive liberalization of international economic relations. Nevertheless, agriculture was excluded from such a process of constructing a liberal economic order. The US is accountable for the exclusion: with the severe farm problems during the Great Depression era vivid in memory, U.S. Congress sought international rules that would be compatible with domestic farm support programs, hoping to maintain as much sovereign rights as possible in determining farm policies (Josling et al, 1990; Friedman, 1993). Specifically, agriculture was excluded from the rules concerning export subsidies (article XVI) and quantitative import restrictions (article XI). The major consequence of the US-led exceptionalization of agriculture was the intensification of government intervention across the developed world making use of

² In general, the Great Depression has instigated the spread of economic nationalism across the world and caused a sharp decline in international commerce, awakening post-war world leaders to recognize the importance of reducing trade barriers in envisioning international economic order after the Second World War.

diverse policy instruments including border protection, supply management, export subsidies, market price guarantees, and income-boosting subsidies.³

For the next four decades, agricultural protectionism has grown in size and become sophisticated through the legislation of farm bills every five/six years in the US and through the initiation of the Common Agricultural Policy (CAP) in 1962 in Europe. The growth in agricultural protectionism was barely questioned prior to the Uruguay Round in 1986 that produced the Agreement on Agriculture (AoA) giving rise to the box system integrating market disciplines and nonmarket mechanisms to incorporate public demand for social, environmental, and rural development functions of agriculture. The AoA prompted developed countries to shift increasing portion of their subsidies to green box policies that are expected to be no or minimally impacting production decisions. The Food and Agricultural Improvement and Reform (FAIR) Act of 1996 in the US eliminated target-price deficiency payment and annual land-idling programs, embarking on a bold move toward more production flexibility and fewer direct production incentives and seemingly bolstering the trend toward less government intervention in line with the URAA (Sumner, 2005).⁴ However, the Farm Security and Rural Investment Act of 2002 reversed such a trend and introduced larger production incentives such as counter-cyclical payments and deficiency payments for dairy products (Sumner, 2003). The CAP has undergone several notable reforms to date including the Manshold Plan in 1971, Mac Sharry reform in

³ While agricultural protectionist policies became prevalent across the developed world, the US took advantage of the exceptional rules for agriculture and emerged as a dominant agricultural exporter in the world market (Friedmann, 1993).

⁴ Paarlberg and Orden (1996) argue that the legislation of the 1996 farm bill was not an attempt to follow the trend of deregulation in agriculture kicked off by the URAA but a coincident that can be explained by changing party control from Democrats to Republicans (Democrats are more comfortable providing benefits to smaller, high-cost farmers while Republicans prefer to benefit larger-sized competitive farmers and input industries) and market conditions (commodity prices peaked in 1996). In fact, when market prices collapsed in 1998 for major commodities, the US Congress was quick to introduce ad hoc legislations to supplement incomes for farmers participating in crop programs.

1992, and the Fischler reform in 2003. In particular, the MacSharry reform substantially reduced support prices for cereals, while the 2003 reform introduced the Single Farm Payment (SFP) as income-boosting policies decoupled from production. In general, farm policy reforms in the US and EU are intended to decouple farm support/subsidies from price and production decisions, thereby attempting to reduce their trade-distorting effects.

Since the late 1980s, the OECD Secretariat has been measuring government support with Producer Support Estimate (PSE).⁵ The total PSE increased in the OECD from \$ 239 billion in 1986-1988 to \$253 billion in 2009. Nearly half of the total PSE in 2009 is attributed to the EU (\$121 billion), followed by Japan (\$47 billion), the US (\$31 billion), Turkey (\$23 billion), and Korea (\$18 billion). The %PSE declined on average among OECD countries from 37 % in 1986 and 30 % in 2000 to 22 % in 2009.⁶ This indicates that the level of government support relative to the gross farm receipts has been declining modestly (OECD, 2010). Except for Turkey, every OECD country experienced a decline in %PSE between 1986-1988 and 2007-2009 (figures 5, 6, 7, and 8). The %PSE varies widely across OECD countries; the highest in Norway (60%), followed by Switzerland (58 %), Korea (51%), Japan (48%), the EU (22%), and the US (10%).

In accordance with the traffic light box system of the URAA, the composition of agricultural support has changed in most OECD countries: i.e., the share of support based on commodity output relative to other criteria that may not require production as a condition of eligibility declined from 85 % of all support in 1986-1988 to about half in 2007-2009, indicating

⁵ The PSE is the monetary value of policy transfers from consumers and taxpayers to producers expressed as a percentage of gross farm receipts. The PSE encompasses both market price supports from border measures (policy measures that maintain domestic prices at levels higher than those at the country's border) and budgetary transfers (policy measures that provide payments to farmers based on criteria such as the quantity of a commodity produced, the amounts of inputs used, the number of animals kept, the area farmed, or the revenue or income received by farmers: payments to input suppliers to compensate them for charging lower prices to farmers; or to subsidise the provision of on-farm services) (OECD, 2009).

⁶ The %PSE represents the share of PSE out of gross farm receipts.

that government support in the OECD countries is becoming increasingly decoupled from production decisions (OECD, 2010). However, there are controversies about the notion that decoupled policies would be minimally trade-distorting. Baffes and Gorter (2005) are generally suspicious about the claim that decoupled policies are not trade-distorting and argue that, for the decoupling schemes to be effective, they should be universal across different subsectors within agriculture. Goodwin and Mishra (2006) show that decoupled policies in the US had modest effects on production decisions, while having negligible effects on acreage decisions. Josling (2004) shows that decoupled subsidies may exert substantive impacts on producers' decisions through three channels: (i) any payment can encourage production if it relieves income constraints on investment, (ii) even when payments are based on historical acres and yields, expectations of the eventual reassessment of those bases can cause farmers to retain land in production of particular crops, and (iii) safety-net policies that reduce the downside risk of fluctuations in income clearly can have an effect of keeping resources in farming. While more research is warranted to further empirically assess whether decoupled payments are truly minimally distortionary, it is conceptually obvious that there are multiple channels that prevent "decoupling" from achieving its intended effects.

3. Comparative Advantage, Static Gains, and Competing Theories

Ricardian theory of comparative advantage was the first formal model articulating that free trade generates the static gains in production efficiency and increases in social welfare by inducing the specialization of production (either complete or incomplete) for both exporting and importing countries even when the exporting (importing) country has absolute (dis) advantages in terms of costs in all the goods traded. Heckscher and Ohlin (1935) refined the theory of comparative

advantage by introducing the role of the differences in factor endowments in determining the pattern of trade. The Heckscher-Ohlin theory suggests that nations would benefit from specializing in the production of goods using their most abundant factor of production. Ricardian and Heckscher-Ohlin theories of comparative advantage constitute the classical theory of trade in support of free trade policies. The first challenge to the theory of comparative advantage and free trade came from the infant industry protection argument advanced first by Alexander Hamilton, the Secretary of Treasury of the United States in 1791 and elaborated by Friedrich List in 1841 to protect their respective countries' manufacturing industries from advanced British manufacturers. Analytically more sophisticated critics on the classical thinking of trade emerged from within itself in the late 70s. Real world trade data showed that trade volume between countries with similar technologies and factor endowments is large and the majority of trade flows is not across industries but within industries in contrast to what the classical theory of comparative advantage suggests. The disparity gave birth to the new trade theory, identifying increasing returns of scale, imperfectly competitive industries, product differentiation, and externalities as potential causes of international trade in addition to differences in technology, factor endowments, and tastes (Krugman, 1979, 1980; Helpman and Krugman, 1985). The new trade theory establishes that such features present an opportunity for a country to use intervention policies (import restrictions or export subsidies) and increase its welfare level, thereby contradicting the preaching of the classical trade theory that any kind of trade interventions is welfare-reducing.

While not very well accepted by economists as a theory of international trade, the "Competitive Advantage of Nations" by Porter (1990) has received considerable attention from management/strategy researchers. Dissatisfied with the existing theories of international trade in

explaining why nations succeed internationally in some particular industries, Porter intended to develop a new paradigm that can more realistically explain trade and investment patterns across countries and the role of a nation's economic environment, institutions, and policies in international competition of firms. Porter's theory of competitive advantage identifies four types of national/industry/firm attributes underlying the determination of the competitive advantage of a nation: (1) factor conditions (human resources, physical resources, knowledge resources, capital resources, and infrastructure); (2) demand conditions (the size of the home demand and the sophistication of home country buyers as determinants of the international competitiveness of countries); (3) firm strategy, structure, and rivalry (systematic differences in the national environment determining strategies and structures of firms across countries); and (4) related and support industries (i.e., specialization causing immovable location advantages arising from the existence of external economies due to local clustering). In addition to the four sets of attributes, Porter considers government policies as an additional factor of importance that may exert influences on the international competitiveness of firms by affecting the four broad attributes.

Some researchers argue that the theory of the competitive advantage of nations is a framework that helps us better understand the international competitiveness of firms, yet it does not amount to a new trade theory given that it does not explain why all countries benefit from trade and it is not about the international competitiveness of nations but of individual industries/firms (e.g., Smit, 2010; Warr, 1994). They contend that Porter's theory should be considered as a tool useful for management practitioners in identifying country sources of competitive advantage and making informed managerial decisions. While Porter's theory is not positioned to replace comparative advantage as a theory of trade, it contributes to the literature on trade by identifying a number of nontraditional factors that would determine the international

competitiveness of firms and particular industries in addition to the traditional economic factors associated with the theory of comparative advantage such as production costs, factor endowments, economies of scale, and market structure.

The brief discussion in this section shows that there is room for states to use protectionist trade policies and increase their national wealth. It should be fair to state that free trade is not a universal policy guidance that is applicable to every case regardless of space/time and the type of industries involved (Krugman, 1986). The theories challenging or modifying the mainstream theory of comparative advantage help us not to be fixated in natural resources and factor endowments in dealing with the determinants of international trade. They allow researchers to probe into other factors that can be important in shaping the pattern of trade and at the same time confer policy-makers of various countries economic rationales for adopting policies that would deviate from the teachings of free trade. In particular, Porter's theory of competitive advantage explicitly recognizes the potentially significant role of firms' strategies in determining their productivity and international competitiveness, thereby embracing the possibility that there could be the Schumpeterian competition among firms around the world and dynamic gains (in addition to the static gains) from free trade.

4. Dynamic/Productivity Gains from Trade

Economists have long held the suspicion that international trade is poised to generate much more than the static gains that traditional theories of trade (Ricardian, Heckscher-Ohlin, The New Trade Theory) are devoted to explain and predict. A growing body of theoretical studies emerged in recent years in support of such a suspicion (e.g., Helpman, 2006; Bernard et al, 2007; Melitz and Trefler, 2012; Antras and Rossi-Hansberg, 2009; Atkeson and Burstein, 2010). They depart

from the traditional theories by explicitly incorporating firm heterogeneity in terms of productivity. The traditional theories pose representative/homogeneous firms, thereby making them incompatible with any types of productivity gains from trade. The new dynamic theory of trade incorporating heterogeneous firms can embrace the coexistence of exporters and nonexporters within the same industry; exporters being more productive than nonexporters prior to the beginning of export (self-selection); and the gap in productivity potentially diverging between the two groups once exporting begins (Bernard et al, 2007).

For example, Baldwin (1992) presented one of the first models affirming the presence of the dynamic gains from trade through its impact on capital accumulation. He develops a simple model in which trade liberalization leads to an increase in the return to capital, thereby inducing capital formation and productivity improvements. Recognizing heterogeneity of firms in terms of productivity, Melitz (2003) shows that firms with different levels of productivity behave in different ways upon exposure to trade: firms with higher productivity would enter the export market; less productive firms would continue to produce only for the domestic market; and the least productive firms would exit. His model, while considering static steady-state economies, demonstrates that there would be gains in average industry productivity arising from the reallocation of resources from less productive to more productive firms. Extending Melitz (2003), Sampson (2015) shows that industry average productivity may increase further due to technology diffusion between firms in addition to reallocation of resources between them. Recognizing that industries and firms continue to evolve and firms are heterogeneous within industries, Ederington and McCalman (2008) show that trade permits gains in productivity at the firm level by affecting the timing of new technology adoptions. They show that trade tends to fasten the rate of the diffusion/adoption of new technological innovations among firms in

exporting industries. Overcoming the finding of previous endogenous growth models that, in the absence of international diffusion of knowledge or factor mobility, trade benefits only technologically advanced countries, Eicher (1999) demonstrates that trade may narrow the rates of technological change and growth between advanced and laggard countries through the latter's investments in human capital and technological change. Melitz and Redding (2014) show that trade improves productivity by motivating firms to reorganize their production, demonstrating the importance of organizational forms in determining productivity. Van Long et al (2011) show that open trade creates the incentives for firms to increase R&D spending for innovation. In an attempt to analyze the effects of exporting on firm performances, Atkin et al (2017) present evidence that exporting firms have learning curves over time (learning-by-exporting), which leads to improved technical efficiency. The learning-by-exporting hypothesis indicates that firms tapping into international markets may gain information from foreign contacts/buyers about ways to improve product quality/designs or production technology.

The theoretical studies show that the most common channel through which the dynamic gains are realized is investments in physical capital/knowledge/education and their accumulation over time. Consistent with the findings of the theoretical models, a solid body empirical studies support the hypothesized gains in productivity by measuring the effects of open trade on total factor productivity (TFP) changes at the firm level. Along with the advancement in the theories of trade at the firm level, plant-level trade data sets became available in the 1990s in various countries considerably facilitating empirical testing of the gains in productivity at the plant level. In general, firms entering the export markets had definitely higher productivity than firms focused on domestic markets (self-selection) and at the same time the former's productivity tended to grow faster than the latter. Van Long et al (2011) show that freeing trade gives rise to

greater incentives to invest in R&D that would lead to technological innovations for what country? Bustos (2011) shows that trade permits exporting firms to gain higher market shares and use the increased revenues for technological upgrading. Clerides, Lach, and Tybout (1998) show that more efficient firms enter the exporting markets, but they report evidence of positive externalities arising from the presence of other exporters in an industry making it easier for domestically oriented firms to break into foreign markets. Van Biesebroek (2005) presents evidence from Sub-Saharan African manufacturing industries that exporting firms exhibit higher productivity increases through learning-by-exporting after entering the export market.

Taking advantage of the data generated from naturally controlled experiments in association with the dramatic policy shifts to an open economy during the 70s through 90s in developing countries such as China, India, and Chile, quite a few studies presented evidence that exposure to import competition matters in explaining differences in productivity growth over time or between tradable and non-tradable goods-producing firms. For example, Brandt, Van Biesebroek, and Zhang (2012) show that improvements in productivity in the manufacturing sector in China stem equally from both “continuing firms” through restructuring efforts and “new entry and exit of inefficient firms.” Pavcnik (2002) shows that policy reforms liberalizing domestic markets in Chile enhanced plant productivity significantly more with the producers of the import-competing goods than those with the nontraded-goods sectors. For India in relation to the comprehensive trade policy reform in 1991, Topalova and Khandelwal (2011) highlight the importance of access to imported inputs of higher quality in determining the firm-level productivity in the manufacturing sector. Brandt et al (2017) show that Chinese accession to the WTO in 2001 accelerated productivity growth in Chinese manufacturing industries facing import competition. While the studies above estimate the effects of trade on productivity in

manufacturing industries for selected countries, Alcalá and Ciccone (2004) use cross-country data to show that the extent of openness at the national level affects average labor productivity through total factor productivity (factor efficiency) but not through physical or human capital.

In summary, the gains in productivity from open trade would be realized through diverse mechanisms including: international exchange of technical information (technology diffusion); access to larger markets and greater incentive to invest in productivity-improving technologies; access to more advanced technologies; access to inputs and intermediate goods of higher quality; reduced price-cost margin; learning-by-exporting; incentives for investments in physical and human capital; and incentives for innovation and the rise of the Schumpeterian environment stimulating industry shake-ups. Analytically, the effects of such various mechanisms on productivity would be manifested through improvements in technical efficiency, capacity utilization, scale efficiency, or technical change. While none of the above studies clearly identify the exact sources of the gains in productivity, some portions of the gains should be coming from technical change.

5. Interpreting the Lack of Dynamic Gains from Trade in Agriculture

In today's world, agriculture represents a sector of special importance for almost every country across industrialized, developing, and least developed countries (LDCs) for different reasons. According to Pingali (2010), agriculture is the primary engine of economic growth for LDCs; for emerging economies, the agricultural sector requires government investments to sustain productivity gains; for industrialized countries, it is important to reduce the size of farm subsidies while promoting agriculture's multifunctional roles such as ecosystem services. The point is that agriculture is important in every country for different reasons in connection with the

country's developmental stage and there are different rationales for government intervention in agricultural production and markets depending on where the country stands in terms of the stage of economic development (Timmer, 2002; Moon, 2015). Making it extremely difficult for WTO member nations to agree on a common set of trade rules, such divergence in agricultural problems and varying needs for government intervention across countries may underlie the failure of the WTO multilateral negotiations (Moon, 2016). We interpret below the lack of the dynamic gains from trade in agriculture in order to provide further insights to better understanding the nature of the difficulty of liberalizing agricultural trade; proffer development strategies for food-importing low income countries; and suggest a new way of governing agricultural trade in the post-Doha Round era.

5.1 Why is it so difficult to liberalize agricultural trade?

The lack of dynamic gains from agricultural trade may explain partially why the efforts of the WTO to liberalize agricultural trade have been so unsuccessful for so many decades. That is, if agriculturally inefficient countries could expect that opening their markets would lead to productivity gains in their own industries, they may not have been so resistant to the proposed trade liberalization in agriculture during the Uruguay and Doha Rounds. In other words, agriculturally inefficient countries wanting to maintain some level of domestic production may have not been at ease about opening their agricultural markets and have taken a defensive position in agricultural trade liberalization negotiations. From the agricultural importing countries' perspective, the static gains alone stemming from the reallocation of existing resources may not be large or important enough to compensate the many adverse effects of opening their markets such as political/economic burdens for displaced farm

producers/employees and concerns/fears about various issues such as food insecurity; stagnated farm economies; too much dependence on foreign sources for food supply (Moon, Han, and Shin, 2016); global food price volatility (Giordani, Rocha, and Ruta, 2016); and multifunctional roles of agriculture (e.g., rural development; ecosystem services; rural amenities).

This paper showed that, unlike the manufacturing firms that are found to exhibit higher productivity growth in the face of foreign competition, in the case of agricultural trade, competing with imports itself would not enhance domestic farm producers' productivity. Further, it showed that it is the state or agri-input supply business corporations that can significantly enhance agricultural productivity. Since it is neither free trade nor greater competition that is needed for improvements in agricultural productivity, the argument for freeing agricultural trade turns out to be less convincing than that in the manufacturing sector. Proponents of free trade in agriculture argue that it is necessary to reduce trade barriers in agriculture comparable to the level of the manufacturing sector in order not to forego the many benefits of free trade. When agricultural trade is liberalized, they tend to foresee the same types of benefits to be generated as in manufacturing. However, this paper suggests that we should anticipate little productivity gain from free trade in agriculture in the absence of increases in public investments in R&D, infrastructure, and extension services. We suspect that this lack of productivity gain from free trade in agriculture would underlie the failure of agricultural exporting countries to persuade agricultural importing countries to agree to freer trade rules in agriculture during WTO trade negotiations.

5.2 Development Strategies in Food-Importing Low Income Countries

The implication for food insecure low income countries is that the state should play a proactive role in enhancing agricultural productivity and promoting agricultural growth rather than relying on market forces and free trade in anticipation that such liberal stance would promote competition and lead to better performance of farm producers and to higher productivity. Some studies suggest that trade liberalization would contribute to reducing poverty and recommend a freer trading regime for developing countries (Winters, McCulloch and McKay, 2004; Winters, 2002; Litchfield, McCulloch, and Winters, 2003). We argue, however, that the recommendation is not appropriate for agricultural development, overall economic development, and poverty reduction in low-income countries for the following reason.

Given that more than 70 % of those in poverty are living in rural areas, agricultural development/growth plays the most crucial role in reducing poverty (the so-called pro-poor growth, Timmer, 2008) and there is overwhelming evidence that agricultural growth is indispensable for overall economic growth, indicating that agricultural growth is critically important for both poverty reduction and overall economic development (Gollin, Pabente, and Rogerson, 2002; Tiffin and Irz, 2006; Self and Grabowski, 2007; McArthur and McCord, 2017). As demonstrated in this study, the important point is that agricultural development cannot be accomplished without competent support and investments for infrastructure and extension services by the state (Gore, 2000; Kay, 2006). Advancing agricultural growth/development in low income countries should be a sustained process of building public institutions in the areas of missing markets (e.g., risks, uncertainty, infrastructure, information provision, social safety nets) and assisting private input markets to rise and function efficiently (North, 1989; Gabre-Madhin et al, 2004; Dorward et al, 2004; Bardhan, 2006), which is exactly what industrialized countries have done to develop their agriculture (Chang, 2009). Institutions are now widely recognized as

the fundamentally crucial factor underlying the rise and efficient operation of markets and economic growth/development (North, 1994; Rodrik, 2004; Acemoglu, Johnson, and Robinson, 2005). Exposing domestic producers to foreign competition prematurely prior to creating public institutions necessary for agricultural markets to function properly may deprive them of the opportunity to compete with foreign imports in a level playing field.

If there are dynamic gains associated with reduced protection and increased competition as in the case of manufacturing industries, then opening domestic markets can be conducive to improving farm productivity. But as has been shown in this paper, that is not the case in agriculture and we contend that free trade policies entail the risk of derailing the entire endeavor of advancing agricultural development in low income countries. In the testimony of this risk, Skarstein (2005) showed for Tanzanian agriculture that economic liberalization during the 1980s including reduced barriers to agricultural trade and the dismantling of government subsidies for agricultural inputs following the advice of international finance organizations not only failed to bring about improvements in agricultural productivity but also resulted in negative growth in agricultural production during some periods in the 1990s.

5.3 Separating agricultural commodities from processed food products in setting trade rules

Building on the first two implications, the third implication is about governing agricultural trade from the global perspective. The lack of the dynamic gains from free trade in agriculture hints that it may be sensible to separate agricultural commodities from food products (produced by food processing/manufacturing corporations) in setting trade rules. We can pursue trade liberalization in the latter, while developing a different form of governance for international trade in the former. Free trade in processed food products should generate dynamic gains as well as

static gains and our world can benefit from greater competition among food processing/manufacturing corporations around the world. Obviously, there is a substantial amount of static gains that can be materialized from liberalizing trade in agricultural commodities. However, the diverse reasons of agricultural protection as noted earlier across countries at varying stages of economic development may be more important than reaping the static benefits from freeing trade in agriculture. If that is the case, our world needs to initiate a dialogue about the separation of the governance of international trade between agricultural commodities and food products and deliberate at the global level what form of global governance for trade in agricultural commodities may be most appropriate in the post-Doha Round era.

References

- Abbott, P.C. and Bredahl, M.E., 1994. Competitiveness: definitions, useful concepts and issues. *Competitiveness in international food markets*, pp.11-35.
- Adamopoulos, T., 2011. Transportation Costs, Agricultural Productivity, and Cross-Country Income Differences. *International Economic Review*, 52(2), pp.489-521.
- Adamopoulos, T. and Restuccia, D., 2014. The size distribution of farms and international productivity differences. *The American Economic Review*, 104(6), pp.1667-1697.
- Ahn, S., 2002. *Competition, Innovation and Productivity Growth: A Review of Theory and Evidence* (No. 317). OECD Publishing.
- Alessandria, G., Choi, H. and Ruhl, K., 2014. *Trade adjustment dynamics and the welfare gains from trade* (No. w20663). National Bureau of Economic Research.
- Alston, J. (2010), "The Benefits from Agricultural Research and Development, Innovation, and Productivity Growth", OECD Food, Agriculture and Fisheries Papers, No. 31, OECD Publishing, Paris.
- Alston, J.M., Beddow, J.M. and Pardey, P.G., 2009. Agricultural research, productivity, and food prices in the long run. *Science*, 325(5945), pp.1209-1210.
- Alston, J.M., Andersen, M.A., James, J.S. and Pardey, P.G., 2011. The economic returns to US public agricultural research. *American Journal of Agricultural Economics*, p.aar044.
- Anderson, J.E., Larch, M. and Yotov, Y.V., 2015. *Growth and trade with frictions: a structural estimation framework* (No. w21377). National Bureau of Economic Research.
- Anderson, K., Cockburn, J. and Martin, W. eds., 2010. *Agricultural Price Distortions, Inequality, and Poverty*. World Bank Publications.
- Anderson, K., 2010. Krueger, Schiff, and Valdes revisited: Agricultural price and trade policy reform in developing countries since 1960. *Applied Economic Perspectives and Policy*, 32(2), pp.195-231.
- Anderson, K., Rausser, G. and Swinnen, J., 2013. Political economy of public policies: insights from distortions to agricultural and food markets. *Journal of Economic Literature*, 51(2), pp.423-477.
- Avila, A.F.D. and Evenson, R.E., 2010. Total factor productivity growth in agriculture: the role of technological capital. *Handbook of agricultural economics*, 4, pp.3769-3822.
- Balat, J., Brambilla, I. and Porto, G., 2009. Realizing the gains from trade: Export crops, marketing costs, and poverty. *Journal of International Economics*, 78(1), pp.21-31.

- Baldwin, R.E., 1992. Measurable dynamic gains from trade. *Journal of Political Economy*, 100 (1), pp.162-174.
- Balistreri, E.J., Hillberry, R.H. and Rutherford, T.F., 2011. Structural estimation and solution of international trade models with heterogeneous firms. *Journal of international Economics*, 83(2), pp.95-108.
- Barney, J., Wright, M. and Ketchen Jr, D.J., 2001. The resource-based view of the firm: Ten years after 1991. *Journal of management*, 27(6), pp.625-641.
- Bernard, A.B., Eaton, J., Jensen, J.B. and Kortum, S., 2003. Plants and productivity in international trade. *The American Economic Review*, 93(4), pp.1268-1290.
- Bernard, A.B. and Jensen, J.B., 2004. Exporting and Productivity in the USA. *Oxford Review of Economic Policy*, 20 (3), pp.343-357.
- Bergsman, J., 1974. Commercial policy, allocative efficiency, and “X-efficiency”. *The Quarterly Journal of Economics*, 88(3), pp.409-433.
- Bernard, A.B., Jensen, J.B., Redding, S.J. and Schott, P.K., 2007. Firms in international trade. *The Journal of Economic Perspectives*, 21(3), pp.105-130.
- Binswanger, H.P. and Deininger, K., 1997. Explaining agricultural and agrarian policies in developing countries. *Journal of economic literature*, 35(4), pp.1958-2005.
- Birkhaeuser, D., Evenson, R.E. and Feder, G., 1991. The economic impact of agricultural extension: A review. *Economic development and cultural change*, 39(3), pp.607-650.
- Brandt, L., Van Biesebroeck, J., Wang, L. and Zhang, Y., 2017. WTO Accession and Performance of Chinese Manufacturing Firms. *American Economic Review* (forthcoming).
- Brandt, L., Van Biesebroeck, J. and Zhang, Y., 2012. Creative accounting or creative destruction? Firm-level productivity growth in Chinese manufacturing. *Journal of Development Economics*, 97(2), pp.339-351.
- Broda, C. and Weinstein, D.E., 2006. Globalization and the Gains from Variety. *The Quarterly journal of economics*, 121(2), pp.541-585.
- Bustos, P., 2011. Trade liberalization, exports, and technology upgrading: Evidence on the impact of MERCOSUR on Argentinian firms. *The American economic review*, 101(1), pp.304-340.
- Chen, Z., Huffman, W.E. and Rozelle, S., 2009. Farm technology and technical efficiency: Evidence from four regions in China. *China Economic Review*, 20(2), pp.153-161.

- Clapp, J., 2017. Food self-sufficiency: Making sense of it, and when it makes sense. *Food Policy*, 66, pp.88-96.
- Clerides, S.K., Lach, S. and Tybout, J.R., 1998. Is learning by exporting important? Micro-dynamic evidence from Colombia, Mexico, and Morocco. *The quarterly journal of economics*, 113(3), pp.903-947.
- Daugbjerg, C. and Swinbank, A., 2012. An introduction to the ‘new’ politics of agriculture and food. *Policy and Society*, 31(4), pp.259-270.
- De Schutter, O., 2014. UN Special Rapporteur on the right to food. *Report on agroecology and the right to food*.
- Dornbusch, R., 1992. The case for trade liberalization in developing countries. *Journal of Economic Perspectives*, 6(1), pp.69-85.
- Edwards, S., 1998. Openness, productivity and growth: what do we really know?. *The economic journal*, 108(447), pp.383-398.
- Evenson, R.E., 2001. Economic impacts of agricultural research and extension. *Handbook of agricultural economics*, 1, pp.573-628.
- Evenson, R.E., Waggoner, P.E. and Ruttan, V.W., 1979. Economic benefits from research: an example from agriculture. *Science*, 205(4411), pp.1101-1107.
- Fan, S. and Pardey, P.G., 1997. Research, productivity, and output growth in Chinese agriculture. *Journal of Development Economics*, 53(1), pp.115-137.
- Fuglie, K.O. and Toole, A.A., 2014. The evolving institutional structure of public and private agricultural research. *American journal of agricultural economics*, 96(3), pp.862-883.
- Gardner, B.L., 1992. Changing economic perspectives on the farm problem. *Journal of economic literature*, 30(1), pp.62-101.
- Gollin, D., Lagakos, D. and Waugh, M.E., 2013. The agricultural productivity gap. *The Quarterly Journal of Economics*, 129(2), pp.939-993.
- Hadley, D., 2006. Patterns in technical efficiency and technical change at the farm-level in England and Wales, 1982–2002. *Journal of Agricultural Economics*, 57(1), pp.81-100.
- Harrison, G.W., Rutherford, T.F. and Tarr, D.G., 1997. Quantifying the Uruguay round. *The Economic Journal*, 107(444), pp.1405-1430.
- Havrylyshyn, O., 1990. Trade policy and productivity gains in developing countries: A survey of the literature. *The World Bank Research Observer*, 5(1), pp.1-24.

- Headey, D., Alauddin, M. and Rao, D.S., 2010. Explaining agricultural productivity growth: an international perspective. *Agricultural Economics*, 41(1), pp.1-14.
- Helpman, E 2006, 'Trade, FDI, and the Organization of Firms', *Journal Of Economic Literature*, 44, 3, pp. 589-630
- Helpman, Elhanan and Paul R. Krugman. 1985. *Market Structure and Foreign Trade: Increasing Returns, Imperfect Competition, and the International Economy*. Cambridge, USA: MIT Press.
- Hertel, T.W. and Keeney, R., 2006. What is at stake: the relative importance of import barriers, export subsidies, and domestic support. *Agricultural Trade Reform and the Doha Development Agenda*, pp.37-62.
- Huffman, W.E. and Evenson, R.E., 2001. Structural and productivity change in US agriculture, 1950–1982. *Agricultural economics*, 24(2), pp.127-147.
- Kay, C., 2006. Rural poverty and development strategies in Latin America. *Journal of agrarian change*, 6(4), pp.455-508.
- Kehoe, T.J., Pujolas, P.S. and Rossbach, J., 2017. Quantitative trade models: Developments and challenges. *Annual Review of Economics*, (0).
- Keller, Wolfgang. 2000. "Do Trade Patterns and Technology Flows Affect Productivity Growth?" *World Bank Economic Review* 14: 17-47.
- Keller, Wolfgang. 2004. "International Technology Diffusion." *Journal of Economic Literature XLII*: 752-782.
- Krueger, A., 1998. Why trade liberalisation is good for growth. *The economic journal*, 108(450), pp.1513-1522.
- Krugman, Paul R. 1979. "Increasing returns, monopolistic competition, and international trade." *Journal of International Economics* 9: 469-479.
- . 1980. "Scale Economies, Product Differentiation, and the Pattern of Trade." *American Economic Review* 70: 950-959.
- . 1981. "Intraindustry Specialization and the Gains from Trade." *Journal of Political Economy* 89: 959-973.
- Lileeva, A. and Trefler, D., 2010. Improved access to foreign markets raises plant-level productivity... for some plants. *The Quarterly Journal of Economics*, 125(3), pp.1051-1099.
- Latruffe, L., 2010. *Competitiveness, Productivity and Efficiency in the Agricultural and Agri-Food Sectors* (No. 30). OECD Publishing.

- Lileeva, A., 2008. Trade liberalization and productivity dynamics: evidence from Canada. *Canadian Journal of Economics/Revue canadienne d'économique*, 41(2), pp.360-390.
- Lileeva, A. and Trefler, D., 2010. Improved access to foreign markets raises plant-level productivity... for some plants. *The Quarterly Journal of Economics*, 125(3), pp.1051-1099.
- López, R.A., 2005. Trade and growth: Reconciling the macroeconomic and microeconomic evidence. *Journal of Economic Surveys*, 19(4), pp.623-648.
- Losch, B., 2004. Debating the multifunctionality of agriculture: from trade negotiations to development policies by the South. *Journal of agrarian change*, 4(3), pp.336-360.
- Madsen, J.B. and Islam, M., 2016. Exploring the widening food gap: an international perspective. *Agricultural Economics*, 47(6), pp.645-659.
- McArthur, J.W. and McCord, G.C., 2017. Fertilizing growth: Agricultural inputs and their effects in economic development. *Journal of Development Economics*, 127, pp.133-152.
- Melitz, M.J., 2003. The impact of trade on intra-industry reallocations and aggregate industry productivity. *Econometrica*, 71(6), pp.1695-1725.
- Melitz, M.J. and Trefler, D., 2012. Gains from trade when firms matter. *The Journal of Economic Perspectives*, 26(2), pp.91-118.
- Moon, W., 2011. Is agriculture compatible with free trade? *Ecological Economics*, 71, pp.13-24.
- Moon, W., Han, D.B. and Shin, H.J., 2016. International Political Economy, the National Food Security of South Korea and the Governance of Global Agriculture in the Post-Doha Era. *Journal of Comparative Asian Development*, 15(2), pp.255-275.
- Moon, W. and G. Pino. 2017. Dynamic Gains from Agricultural Trade? Unpublished manuscript. Southern Illinois University Carbondale.
- Nickerson, M. and Konings, J., 2007. Trade liberalization, intermediate inputs, and productivity: Evidence from Indonesia. *The American Economic Review*, 97(5), pp.1611-1638.
- Pavcnik, N., 2002. Trade liberalization, exit, and productivity improvements: Evidence from Chilean plants. *The Review of Economic Studies*, 69(1), pp.245-276.
- Pollack, A. 2008. Monsanto seeks big increase in crop yields. *New York Times*, June 5.
- Rausser, G.C., 1992. Predatory versus productive government: the case of US agricultural policies. *The Journal of Economic Perspectives*, 6(3), pp.133-157.
- Reimer, J.J. and Li, M., 2010. Trade costs and the gains from trade in crop agriculture. *American Journal of Agricultural Economics*, 92(4), pp.1024-1039.

Rodriguez, F. and Rodrik, D., 2000. Trade policy and economic growth: a skeptic's guide to the cross-national evidence. *NBER macroeconomics annual*, 15, pp.261-325.

Ruttan, V.W., 2002. Productivity growth in world agriculture: sources and constraints. *The Journal of Economic Perspectives*, 16(4), pp.161-184.

Scherer, F.M., 1992. Schumpeter and Plausible Capitalism. *Journal of Economic Literature*, 30(3), p.1416.

Skarstein, R., 2005. Economic liberalization and smallholder productivity in Tanzania. From promised success to real failure, 1985–1998. *Journal of Agrarian Change*, 5(3), pp.334-362.

Skogstad, G., 1998. Ideas, paradigms and institutions: agricultural exceptionalism in the European Union and the United States. *Governance*, 11(4), pp.463-490.

Sunding, D. and Zilberman, D., 2001. The agricultural innovation process: research and technology adoption in a changing agricultural sector. *Handbook of agricultural economics*, 1, pp.207-261.

Thirtle, C., Lin, L. and Piesse, J., 2003. The impact of research-led agricultural productivity growth on poverty reduction in Africa, Asia and Latin America. *World Development*, 31(12), pp.1959-1975.

Timmer, C.P., 2002. Agriculture and economic development. *Handbook of agricultural economics*, 2, pp.1487-1546.

Timmer, P., 2008. Agriculture and pro-poor growth: an Asian perspective. *Asian Journal of Agricultural Development*. 5(1): 1-28.

Van Biesebroeck, J., 2005. Exporting raises productivity in sub-Saharan African manufacturing firms. *Journal of International economics*, 67(2), pp.373-391.

Van der Mensbrugge, D. and Beghin, J.C., 2005. Global agricultural reform: What is at stake?. *Global agricultural trade and developing countries*.

Wernerfelt, B., 1984. A resource-based view of the firm. *Strategic management journal*, 5(2), pp.171-180.

Winders, B., 2009. The vanishing free market: The formation and spread of the British and US food regimes. *Journal of Agrarian Change*, 9(3), pp.315-344.

Winters, L.A., 2004. Trade liberalisation and economic performance: an overview. *The Economic Journal*, 114(493).