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The Fractured Conversation about Trade and Food Security

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ABSTRACT

There is a heated debate among policy makers, civil society, and analysts about the impact of trade and trade policies on food security. While there have been several empirical reviews on these issues the controversy has not abated. This paper surveys possible reasons why the polemic continues and why it may be difficult to settle it unequivocally. The reasons are related to the different notions of *trade, food and nutrition security*, the variety of possible indicators for those concepts, the multiplicity of channels through which trade and food and nutrition security notions interact, the diversity of analytical and quantitative approaches utilized, and differences in values and conceptual priors about the operation of the world economy. The paper concludes with some reflections about what can be reasonably said about the potential impacts of trade on food security.

Keywords: trade, food security, nutrition security, developing countries

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1. INTRODUCTION

The links between trade and food security have received particular attention in public debates, stirring strong views that cover a whole range of opinions: from those who argue that trade causes hunger (Madeley 2000) to others who believe a complete liberalization of world agricultural trade is the best possible approach for food security (for instance, Griswold 1999).

There have been comprehensive reviews of case studies analyzing the issues involved (FAO 2003; Thomas 2006; OECD 2013; Brooks and Matthews 2013; McCorriston et al. 2013). That systematic review of evidence, however, does not seem to have abated the controversy, as shown by the different discussions about the “right to food” (see, for instance, the debate between De Schutter [2011], on one hand, and Lamy [2011] on the other), “food sovereignty” (see the 2014 special issue of *The Journal of Peasant Studies*, with an introduction by Edelman et al. [2014]), and other similar concepts.

The disagreements about trade and food security are related to similar controversies about trade and poverty (see the reviews by Winters, McCulloch, and McKay 2004; and Winters and Martuscelli 2014), and about globalization, poverty, and food security (Díaz-Bonilla 2002; Díaz-Bonilla and Robinson 2001).

This paper does not pretend to settle the controversies, but as expressed in the apt title of Kanbur (2001), the focus is on trying to understand “the nature of the disagreements,” hoping that such understanding may make the policy dialogue more fruitful. Kanbur (2001) argued that what drives the discussion between opposing groups on poverty and globalization (which he called the “Finance Ministry (FM) type” and the “Civil Society (CS) type”) are based on differences in (1) aggregation (FM types think in terms of incidence of poverty—percentage of poor people over total population—and use national averages, while CS types look mostly at absolute numbers, usually at more disaggregated levels); (2) time horizons (the FM group thinks in terms of the medium term while the CS group usually looks at the short run—concerned about poverty now—or the long run—how sustainable policies are over the 50- to 100-year horizon); and (3) market power (FM types tend to see the policies playing out in a more competitive economy, while CS types consider that markets are noncompetitive, dominated by powerful agents that can influence governments too) (Kanbur 2001).

Building on that analysis, Díaz-Bonilla (2002) explored additional sources of disagreement, arguing that the discrepancies occur at least at four levels: (1) the trends in poverty and income distribution; (2) the meaning of globalization; (3) the links between the outcomes identified in (1) and the process of globalization as defined in (2); and (4) more structural disagreements related to the definition of welfare objectives and the role of poverty in the world economy (see also Díaz-Bonilla and Robinson 2001). Similar disagreements appear in the debate about trade and food security, as argued here.

This paper is structured in seven parts, including this introduction. After the latter, there is first a brief discussion of the different meanings of “trade” (Section 2) and of “food security” (Section 3) that have been utilized in this debate. The paper then moves to the discussion of different conceptual frameworks that try to identify the main linkages and conditioning factors in relation to trade and food security (Section 4) in their various definitions. Using a specific conceptual framework (from Díaz-Bonilla, et al. 2000), this paper then analyzes different channels through which trade may impact on food security, arguing that such a variety of channels and the different meanings of trade and food security all significantly contribute to the differing views on the topic of this paper. Section 5 reviews empirical studies on trade and food security, both at the general level and in relation to the different channels identified in Section 4. Section 6 speculates on why disagreements may persist even after considering the empirical evidence. A final section concludes.

2. WHAT IS THE MEANING OF “TRADE” IN “TRADE AND FOOD SECURITY”?¹

Trade, Trade Policies, and WTO Trade-Related Policies

It is useful to distinguish “trade,” as the physical and economic exchange of goods and services; “trade policies,” as the interventions of governments in those economic and physical flows when they go across national boundaries; and “WTO trade-related policies,” as a larger set of policies.

Some of the debates seem to focus on the mere expansion of trade in the first sense as affecting food security. For instance, De Schutter argued that the debate on trade and food security “must acknowledge the dangers for poor countries in relying excessively on trade” (2011, 1). He contended that “these countries are caught in a vicious cycle. The more they are told to rely on trade, the less they invest in domestic agriculture. And the less they support their own farmers, the more they have to rely on trade” (2011, 1). On the other hand, most economists would consider that trade is simply the connection between supply and demand through which human beings exercise their freedom to exchange goods and services, leading presumably to greater efficiency, and more variety and stability in consumption (the latter because of the balancing role of trade, which allows people to smooth consumption in the face of shocks to domestic production; see, for instance, OECD 2013; Abbott 2010).

The previous notion of “trade” considers events that may be happening because of impersonal forces of technology, demography, and the like, with or without government intervention. The notion of “trade policies,” obviously, refers to something that governments do. In economic terms, those policies usually denote governmental measures at the border, applied when goods and services are crossing a country’s frontier as they come from or go to the rest of the world. These policies include import taxes and quotas, export subsidies or export taxes, import or export bans, the operation of state trading enterprises, and other nontariff measures (such as health and safety procedures, among others) with some equivalence to tariffs and trade restrictions. In this context, “trade liberalization” is considered the reduction or elimination of barriers to trade that are directed at the agricultural and food sectors of the economy resulting from the use of government instruments at the national frontier or border that impact on imports or exports, such as the ones mentioned earlier (McCorriston et al. 2013).

These two different definitions may lead to dissimilar prescriptions about what the government can or should do. For instance, if “trade causes hunger,” and trade is expanding because of governmental policies, then the government can stop promoting that expansion, that is, utilize protectionist measures, the preferred option of many who distrust the expansion of trade. On the other hand, if trade expansion simply reflects supply and demand developments that are occurring because of changes in incomes, endowments, technologies, or preferences, then policies interfering in these processes to reduce trade could conceivably generate negative consequences not only for growth and efficiency but also for poverty alleviation and food security.

In addition to border measures, the notion of “trade policies” has been further expanded, as part of world trade agreements, to a series of *domestic* measures that operate within national borders. This expanded interpretation results from the negotiations under the General Agreement on Tariffs and Trade (GATT) first, and the World Trade Organization (WTO) later. Considering that during the different rounds of trade negotiations, countries exchanged concessions² (such as reduction of tariffs for some products), then it is assumed that if countries have agreed to the full package negotiated, there is a balance of rights and obligations, reflected in reciprocal market access opportunities. Based on that assumption,

¹ What follows is based on Chapter 11 of Díaz-Bonilla (2015b).

² It has been widely noted that the diplomatic/legal view of trade negotiations takes usually the perspective of producers; thus reducing a tariff, for example, is a concession, a cost for the country, which has to be compensated by some concession offered by the trade partner in terms of access to the domestic market of the latter. This is in many cases also the view of organizations of civil society following trade negotiations and, of course, of the associations representing producers. On the other hand, the economic view focuses mainly on consumers and would see tariff reductions as a tax cut for consumers that, along with any other measure that improves consumption opportunities through trade, represents a benefit for the country. The differences in these two visions continue to complicate diplomatic, legal, and economic debates around trade negotiations.

then not only border measures but also domestic policies may affect the balance of rights and obligations and of reciprocal market access opportunities that have been negotiated. Therefore, GATT included since the beginning some regulations related to domestic measures (such as subsidies to production) that could affect market access opportunities. This broader legal interpretation of trade policies, which was nonetheless more limited in the 1948 GATT, has been greatly expanded since the WTO was created in 1995 as part of the conclusion of the Uruguay Round of trade negotiations.

For instance, the WTO Agreement on Agriculture (AoA) considers three pillars of the negotiations: market access (mainly but not exclusively border measures related to imports), export competition (also largely border measures related to exports but also including credits, international food aid, and the operation of state enterprises), and domestic support (a series of domestic government programs operating within the country's frontier). Only the first two pillars include obvious border measures.

The Uruguay Round also led to agreements on other legal texts, such as those on intellectual property rights, which many observers and developing countries have argued are not really related to trade.³ However, the Agreement on Trade-Related Aspects of Intellectual Property Rights (TRIPS) and the Agreement on Trade-Related Investment Measures (TRIMs), for example, are part now of the legal framework to which WTO members are committed. Furthermore, the Uruguay Round expanded the legal WTO coverage from goods to services with the approval of the General Agreement on Trade in Services (GATS).

Therefore, the term “trade policies” may be used in two separate meanings: one is narrower, focusing on border measures, and the other would be the more expansive view embedded in the WTO legal texts.

At minimum, the discussion of trade and food security must include the usual economic perspective on border measures, but it also refers to topics related to agriculture and food security that are part of the broader WTO definition. As noted, this is the case of the three pillars embedded in the AoA. Furthermore, the discussion of government policies may be expanded to other trade-related measures with implications for agriculture, such as sanitary and phytosanitary measures and other technical regulations, intellectual property rights, and the treatment of state trading enterprises.

Given the variety of issues and policies, it is important to clarify the notion of “trade” utilized in the controversies about the links to food security: is it the expansion of trade alone, does it refer to policies and changes in them, such as “trade liberalization,” or does it allude to the implementation of the WTO legal framework (and what part)?

Quantification of Trade Measures

Furthermore, whatever concept of trade is utilized, it has to be quantified in some way as to be able to make a serious analysis of the potential links to food security. For instance, the controversies about the virtues or defects of closed/protected economies versus open/liberalized ones are complicated by how to measure those concepts, which are usually not binary categories but may include a range of policies with different levels of implementation. Even the oft-quoted study of Sachs and Warner (1995) that classifies countries as either “open” or “closed” does that on the basis of five variables: the level of average tariffs; the coverage of nontariff barriers; being or not being a socialist economy; having or not having a state monopoly on major exports; and the level of the black market premium for the exchange rate. Only three of those variables refer to trade issues in any of the meanings discussed before.

³ Many low-income developing countries argue that they were unable to properly analyze some of those obligations, given their limited resources, and felt that they did not have other options than to accept what was presented or be excluded from the overall agreement.

Other studies have looked at “openness,” based on some variables such as the level of trade as percentage of gross domestic product (GDP)⁴ or its changes.⁵ But those indicators reflect outcomes of multiple factors, only some of which may be trade policies. This was noted by Rodriguez and Rodrik (1999) and Rodrik (2001), who presented criticisms of the different empirical measures utilized as proxies for openness and trade liberalization in many of the multicountry econometric studies.

Nonagricultural Trade and Nontrade Policies

Empirical studies show that the final impact of trade measures on agriculture and on food production and consumption depend on whether they apply only to agricultural and food products (or even just to a subset of them), or whether changes in trade policies also affect nonagricultural and nonfood products. The overall impact of the trade policies considered also depends on whether the trade policy change happens in just one country, which may be opening or closing its economy unilaterally, or whether such changes are taking place simultaneously in multiple countries, as happens with the implementation of regional, plurilateral, or multilateral trade agreements.

Furthermore, in empirical analyses and case studies, trade liberalization is usually mixed with other policy changes variously defined as “privatization,” “structural adjustment,” and so on (see Thomas 2006; Díaz-Bonilla 2013; and McCorriston et al. 2013).

Table 2.1 shows the variety of possible interpretations of the terms being utilized to discuss trade issues.

Table 2.1 Trade policies: meanings and levels of application

Sectors	Trade	Trade policies	WTO trade policies	Other (nontrade) policies
Agriculture and food	Expansion or decline: national, regional, global	1. National level: free trade, intermediate, or protectionism 2. Regional or global levels: free trade, intermediate, or protectionism	1. Agreement on Agriculture 2. Agricultural aspects of SPS, TBT, TRIPS, others	Macroeconomic policies, privatization, liberalization of domestic market, and others, as they directly affect agricultural and food issues
Nonagricultural and nonfood	Expansion or decline: national, regional, global	1. National level: free trade, intermediate, or protectionism 2. Regional or global levels: free trade, intermediate, or protectionism	Nonagricultural aspects of TRIPS, TBT, GATS, others	Macroeconomic policies, privatization, liberalization of domestic market, and others, as they directly affect other nonagricultural and nonfood issues

Source: Author.

Notes: GATS = General Agreement on Trade in Services; SPS = Agreement on the Application of Sanitary and Phytosanitary Measures; TBT = Technical Barriers to Trade Agreement; TRIPS = Agreement on Trade-Related Aspects of Intellectual Property Rights.

⁴In that regard, some people cited the high values for that ratio in Africa south of the Sahara (SSA) as evidence that excessive trade leads to poor economic performance (Mazur 2000). However, with higher levels of openness than SSA, East Asian countries have done much better.

⁵For instance, Dollar and Kraay (2001) compared changes in openness rather than absolute levels and concluded that countries that increased their integration in global trade (called “globalizers”) have done better than those that did not. However, looking at levels instead of changes in levels, either trade/GDP ratios or import tariffs, countries labeled as “non-globalizers” in that study have larger ratios of trade to GDP and lower tariffs than the countries labeled “globalizers.” Also, Birdsall and Hamoudi (2002) showed that the positive correlation found by Dollar and Kraay (2001) between growth and increases in the trade/GDP ratio is related to the commodity dependence of the countries performing worse; thus, the collapse in prices reduced both growth and the value of the variable interpreted as a proxy for openness, creating a misleading correlation.

Some Conclusions

In summary, the first point to be emphasized is the need to clearly define the notion of trade being utilized in the debate. The second issue is that in causal analyses it is necessary to use quantitative measures clearly related to the notion utilized. In this regard it is also important to distinguish indicators of outcomes (for instance, trade as percentage of GDP) from indicators of policies, and within the latter it is necessary to separate which ones are trade policies and which ones are non-trade related. Third, it is very relevant to determine whether the trade policy changes focus only on agricultural and food products (or a subset of them) or apply to all products, and what concurrent nontrade policies are being implemented, in order to understand the systemic, economywide implications of the policies analyzed. At least part of the disagreement on the links between trade and food security is related to imprecise conceptualization of these three issues.

3. WHAT IS THE MEANING OF “FOOD SECURITY”?

Definitions

To understand the linkages and impacts of trade on food security, it is also necessary to agree on the meaning of the latter and how to measure it.

Food security has been analyzed at the global, national, regional, household, and individual levels. The United Nations Conference on Food and Agriculture that was held at Hot Springs, Virginia, in May–June 1943, and led to the creation of the Food and Agriculture Organization of the United Nations (FAO) in 1945, clearly focused on the individual as a consumer of food. The final declaration stated “its belief that the goal of freedom from want of food, suitable and adequate for the health and strength of all peoples can be achieved.” (quoted in Shaw 2007, 3) It also unmistakably defined poverty as the main obstacle to attaining the goal of freedom from want of food (see the references in Shaw 2007). The declaration outlined as well an ambitious global economic and social program that included but went beyond trade issues alone.

This broad view of trade security and policies got more limited over time due to several factors (see the discussion in Díaz-Bonilla 2015a). Basically, the reconstruction of Europe and Japan after World War II led to concerns about production issues in the 1950s and 1960s, while the price shocks of the early 1970s also generated fears about scarcity of production. In fact, the World Food Conference held in Rome in 1974 emphasized a definition of food security from the supply side as “availability at all times of adequate world food supplies of basic foodstuffs to sustain a steady expansion of food consumption and to offset fluctuations in production and prices” (CFS 2012, 4).

However, the collapse of commodity prices during the second half of the 1980s suggested that production did not seem to be the main limitation to achieving food security. Therefore, the focus moved away from the global and national perspectives related to availability, and toward food access and utilization at the household and individual levels, where the problem of food security emerges in a more concrete way (Maxwell 1996). The point made by the 1943 UN conference that the main obstacle to access to food was poverty and lack of income opportunities, rather than food supply, was rediscovered in the 1980s (Sen 1981). The issues of variability around the trend of both food supply and access, and their sustainability over time, were also increasingly highlighted (Maxwell 1990). Another basic point made clearly in 1943 but presented much later as a refinement to the definition of food security was that food intakes must go beyond what is needed for simple survival in order to support an active and healthy life.

The 1996 World Food Summit pulled together most of those different components when it asserted that “food security exists when all people, at all times, have physical and economic access to sufficient, safe, and nutritious food to meet their dietary needs and food preferences for an active and healthy life” (FAO 1996, paragraph 1 of the World Food Summit Plan of Action). (See chapter 2 in FAO [2003] for a history of the successive definitions of food and nutrition security.) But physical availability and economic access are only preconditions for adequate utilization of food. In fact, food availability and even access do not determine unequivocally the more substantive issue of malnutrition or nutrition insecurity at the individual level when measured with anthropometric indicators (Smith 1998; Smith and Haddad 2000).

Smith (1998) noted that the indicator of undernutrition utilized by the Food and Agriculture Organization⁶ (a measure of availability of calories at the national level, doubly corrected by the gender and age structure of the population, and by the consumption or income distribution profile of the country), although obviously showing a quite close correlation with national food availability measures, was more weakly correlated with measures of malnutrition based on anthropometric measures. For instance, Smith

⁶ The traditional indicator for hunger and food insecurity has been the “prevalence of undernourishment,” calculated by the FAO, which was adopted as the official Millennium Development Goal indicator for Goal 1, Target 1.9. It expresses the probability that a random individual from a country consumes an amount of calories (the habitual daily “dietary energy consumption”) that is insufficient to cover his or her energy requirement for an active and healthy life (which is called the “minimum dietary energy requirement”).

and Haddad (2000) analyzed nutrition insecurity at the individual level (utilizing child malnutrition as the indicator) and found that although national food availability plays a role, there are other important determinants as well, such as the health environment, women's education, and women's relative status in the society.

The implication was the need to distinguish undernourishment, linked to calorie intake, from malnutrition, a physiological condition related to food intake but affected by other determinants as well. More recent definitions clearly differentiate food security and nutrition security; for example, a recent FAO, IFAD, and WFP report (2013) uses the following definitions:

Food insecurity. A situation that exists when people lack secure access to sufficient amounts of safe and nutritious food for normal growth and development and an active and healthy life. It may be caused by the unavailability of food, insufficient purchasing power, inappropriate distribution or inadequate use of food at the household level. (2013, 50)

Nutrition security. A situation that exists when secure access to an appropriately nutritious diet is coupled with a sanitary environment, adequate health services and care, in order to ensure a healthy and active life for all household members. Nutrition security differs from food security in that it also considers the aspects of adequate caring practices, health and hygiene in addition to dietary adequacy. (2013, 50)

The latter definition needs to also consider the fact that the world now suffers from what has been called the “triple burden” of malnutrition affecting households and individuals (Pinstrip-Andersen 2007): undernutrition, the traditional focus of food insecurity, caused by insufficiencies in calories and proteins; overnutrition, leading to obesity, diabetes, and cardiovascular problems; and deficiencies in micronutrients, with various negative health outcomes. In developing countries, it has been documented that under- and overnutrition may coexist even within the same family (see Garrett and Ruel 2003; IFPRI 2014).

While the double burden of undernutrition and micronutrient deficiencies fits within the notion of “nutrition security,” which is thought of as a somewhat linear spectrum from insecure to secure, the problems related to overnutrition may require a more precise characterization of what “healthy and active life” means. The latter suggests a rather nonlinear relation, with overconsumption being also part of “malnutrition,” although it would seem awkward to apply the term “nutrition insecurity” to a situation in which there is an excess of consumption, and perhaps a better term needs to be coined for this condition.

Measurement

As in the case of trade, given the different definitions of food and nutrition security, it is crucial how those concepts are measured: it would be impossible to seriously evaluate the links between trade and food and nutrition security without appropriate indicators to capture those concepts that are basically multidimensional. Here I will briefly comment on what can be called “primary indicators” to distinguish them from aggregate indicators that are combinations of mostly primary ones, such as the Global Hunger Index (GHI) (see IFPRI, Concern Worldwide, and Welthungerhilfe 2013) or the Global Food Security Index (GFSI) published by the Economist Intelligence Unit.⁷

Another point to be noticed, which was already briefly mentioned in the discussion about trade, is that some indicators and indexes signal policy interventions; others may show the direct results of those interventions; still others may reflect outcomes and impacts, resulting from a variety of factors, not only government interventions; and finally, there may be indicators of structural conditions, some of which

⁷ The International Food Policy Research Institute (IFPRI), Concern Worldwide, and Welthungerhilfe developed the GHI, which attempts to reflect the multidimensional nature of hunger, combining three equally weighted indicators into one index: (1) the proportion of undernourished people as a percentage of the population (which is FAO's indicator, mentioned before); (2) the proportion of children younger than age five who have low weight for their age; and (3) the mortality rate of children younger than age five (IFPRI, Concern Worldwide, and Welthungerhilfe 2013). The GFSI aggregates 28 variables into a single indicator. It also reports 7 “background variables.”

may be influenced by governmental interventions only in the long run, if at all. Although each one of these indicators has implications for food and nutrition security, there is a difference between those that focus on policy levers that can be utilized by governments (actionable indicators) and those that describe the different types of more or less structural conditions in different countries but may not necessarily point to clear governmental interventions (Díaz-Bonilla, Orden, and Kwieciński 2014).

Also, the definitions of food and nutrition security are usually considered to encompass four main components: availability (which is usually represented by indicators of domestic supply and trade of food); access (for which a series of indicators has been suggested linked to income, employment, income distribution, poverty, food inflation, and market power); utilization (which has been represented by direct indicators of nutrition status but also more indirect indicators about the nutritious quality of food, and has also included other factors such as health services, water and sanitation infrastructure, education, empowerment of women, and good governance); and stability (which is represented by different indicators of variability in availability, access, and quality of food and health services).

Because food and nutrition security is a multidimensional concept, the main issue then is how to organize and present the large array of potential indicators, such as those documented in the Food Insecurity and Vulnerability Information and Mapping Systems.⁸

Pangaribowo, Gerber, and Torero (2013) reviewed potential indicators in detail, classifying them into three major categories:⁹ (1) indicators that measure food and nutrition security *status/outcomes*; (2) indicators that measure *drivers, determinants, and risks* related to food and nutrition security; and (3) indicators to measure *policy interventions and processes* related to food and nutrition security. They combined those three levels with (1) the four dimensions of availability, accessibility, utilization, and stability (or vulnerability); (2) the time scale of those indicators (that is, whether they refer to short-term/transitory aspects or long-term/persistent ones; and (3) the level, from macro (world, regional, national) to micro (household, individual). The authors included such classification in Annex 1 of their paper, which presents a long list of potential indicators. They showed a more reduced set of indicators as a possible minimum to be considered when discussing outcomes (Table 3.1).

⁸ http://www.nfpcsp.org/agridrupal/sites/default/files/Lao_FIVIMS_Training_Guide_for_FIVIMS_Data_Analysis_and_Mapping.pdf

⁹ Matthews (2013) also divided indicators into three groups: initial conditions, policies and strategies, and outcomes.

Table 3.1 Potential indicators for food and nutrition security

Availability	Accessibility	Utilization	Stability
Per capita total amount of net calories available in a given country (FAO/National) (taking into account the level of import and export in terms of calories)	Average share of food expenditures in total household expenditures (FAO, National Household Surveys, or computed from LSMS expenditure module/National and household)	Prevalence rate of stunting for children under 5 years (WHO, UNICEF/National)	Per capita food supply variability (FAO/National)
Net Share of energy supply (calories) derived from cereals, roots and tubers (FAO/National)	Prevalence rate of undernourished people (FAO/National)	Prevalence rate of underweight among children under 5 years (WHO, UNICEF/National)	Domestic Food Price Volatility (FAO/National)
Average supply of protein derived from animal sources (FAO/National)	Depth of food deficit (FAO/National)	Diet Diversity Score (National Household Surveys, or computed from LSMS expenditure module/Household)	
		Prevalence of overweight and obese adults (Based on BMI measures in DHS – women only/National)	
		Prevalence rate of anemia among women or reproductive age and children under 5 years (WHO, UNICEF/National, FeedThe Future/National);	

Source: Pangaribowo, Gerber, and Torero (2013).

Notes: FAO = Food and Agriculture Organization of the United Nations; LSMS = Living Standards Measurement Study; WHO = World Trade Organization.

Another simplified version of the potential larger array of indicators is in FAO, IFAD, and WFP (2013), which includes not only outcomes but also drivers and policy levers (Table 3.2).

A point to be noted concerning the Tables 3.1 and 3.2 is that they include some indicators of dietary diversity; this seems relevant considering that lack of dietary diversity is correlated with child stunting/wasting and underweight mothers (Arimond and Ruel 2006). The issue of dietary diversity also has implications for trade negotiations to the extent that it challenges the reductionist view of a limited number of “food security crops,” usually limited to major cereals (such as wheat, rice, and maize). Another aspect to be mentioned is that Table 3.1 (but not Table 3.2) includes a measure of overnutrition.

Table 3.2 Potential indicators for food and nutrition security

The suite of food security indicators		
FOOD SECURITY INDICATORS	DIMENSION	
Average dietary energy supply adequacy Average value of food production Share of dietary energy supply derived from cereals, roots and tubers Average protein supply Average supply of protein of animal origin	AVAILABILITY	STATIC and DYNAMIC DETERMINANTS
Percentage of paved roads over total roads Road density Rail lines density	PHYSICAL ACCESS	
Domestic food price index	ECONOMIC ACCESS	
Access to improved water sources Access to improved sanitation facilities	UTILIZATION	
Cereal import dependency ratio Percentage of arable land equipped for irrigation Value of food imports over total merchandise exports	VULNERABILITY	
Political stability and absence of violence/terrorism Domestic food price volatility Per capita food production variability Per capita food supply variability	SHOCKS	ACCESS
Prevalence of undernourishment Share of food expenditure of the poor Depth of the food deficit Prevalence of food inadequacy	ACCESS	
Percentage of children under 5 years of age affected by wasting Percentage of children under 5 years of age who are stunted Percentage of children under 5 years of age who are underweight Percentage of adults who are underweight Prevalence of anaemia among pregnant women Prevalence of anaemia among children under 5 years of age Prevalence of vitamin A deficiency (forthcoming) Prevalence of iodine deficiency (forthcoming)	UTILIZATION	

Source: FAO, IFAD, and WFP (2013).

A related issue is that if food and nutrition security is defined by a variety of indicators, there may be complementarities among them (such as improving water and sanitation, and expanding rural health care services), but also there can be trade-offs: for instance, policies that increase the price of food may lead to more availability but may also reduce access for poor consumers. This is a basic dilemma in food policy that governments have tried to solve with a variety of interventions, not always beneficial from the point of view of poverty alleviation, food security, economic efficiency, or macroeconomic stability (see, for instance, Timmer, Falcon, and Pearson 1983; Díaz-Bonilla 2015b).

In summary, this brief review of the variety of definitions and potential indicators, even in the simplified formats shown above, immediately indicates the difficulties in unequivocally linking the multidimensional concept of “trade” with the even more multidimensional notions of “food and nutrition security.” Some of the possible links are discussed next.

4. WHAT ARE THE LINKS BETWEEN TRADE AND FOOD AND NUTRITION SECURITY?

A well-known framework for analyzing the linkages between trade and food security is the one utilized in the comprehensive studies conducted by the FAO and collected in FAO (2003) and Thomas (2006). The basic structure, presented in a simplified format in McCorriston and others (2013), is shown in Figure 4.1.

Figure 4.1 An economic framework

Source: McCorriston et al (2013), based on FAO (2003) and Thomas (2006).

Several points should be mentioned. First, the policies considered include more than trade aspects. As the title of the first block in Figure 4.1 indicates, the cases analyzed are episodes of “policy reform” in general, suggesting the difficulties in assigning impacts and outcomes to trade alone when they are part of a whole policy package. A second point is the emphasis on price analysis as a key factor in the transmission from policies to final outcomes. A question is whether there are other potential channels in addition to prices that may need to be highlighted as well. Third, the immediate intervening factor before moving to direct food security outcomes is incomes. Thomas (2006) appropriately noted that the analysis should include not only changes in prices but also effects on production, wages, and employment, and on public and private transfers (from public safety nets to remittances).

While the previous framework focused on economic aspects and emphasized mostly the definition of food security, the nutrition community follows mainly the widely used UNICEF framework for nutrition analysis. It differentiates three levels of determinants of undernutrition—basic, underlying, and immediate causes of undernutrition—each with different possible indicators (an example of the UNICEF framework is in Figure 4.2). The focus there is mostly on nutritional issues and their consequences.

Figure 4.2 A nutrition-focused framework

Source: Black and others (2008).

Other frameworks have focused on economic links to poverty outcomes, emphasizing the functioning of markets but also government operations, as in McCulloch, Winters, and Cirera (2001). Figure 4.3 presents a simplified version of these authors' poverty-focused framework.

Figure 4.3 A poverty-focused framework

Source: Higgins and Prowse (2010), based on McCulloch, Winters, and Cirera (2001).

Another possible pictorial representation is Figure 4.4, based on Díaz-Bonilla, et al (2000), which in turn is based in part on Smith 1998 (which separates the concepts of food security and nutrition security, as in Figure 4.2) but also expands the channels to also consider other economic and poverty aspects, in line with both Figure 4.1 and Figure 4.3. It highlights the presence of several policies and factors, not only trade issues, while suggesting other potential channels beyond price transmission mechanisms that may affect food and nutrition security.

In what follows I will basically use Figure 4.4 to discuss some of the main channels linking trade with food and nutrition security that have been highlighted in academic and political debates. In the next paragraphs I try only to describe the potential links and the debates. Later, in Section 5, I will briefly focus on some conceptual and empirical issues about the operation of those links.

Figure 4.4 A conceptual framework for food and nutrition security

Source: Díaz-Bonilla, Thomas, and others (2000).

Channels Linked to Stable Food Availability and Related Issues

Trade and trade policies (along with other macroeconomic policies and events) influence world food availability as well as production and food net trade (including exports, imports, and food aid) at the national level. Those policies (particularly if interpreted not only as encompassing border measures but as also including domestic support measures considered in the AoA of the WTO) have effects on the operation of factor, input, and product markets and the respective prices and wages. Through their impact on agricultural and food production, they determine national food availability, the first component in the definition of food security. They can also determine how food supplies are distributed at the subnational level, across domestic regions, between urban and rural markets, and at different points in time, affecting availability geographically and temporally. Finally, those policies may have impacts on the stability of availability (the fourth component of the notion of food and nutrition security).

Some of the debates at this level are briefly outlined immediately below, focusing mainly on stable availability. Issues related to income generation, access, and related topics are discussed later.

Displacement of, or Complementarities with, Domestic Production

The issue is whether trade may be displacing domestic food production or whether food imports complement national availability. If trade is displacing domestic production one for one, presumably because of lower prices, and such production is based on small producers or generates negative employment effects among rural workers, there may be a decline in income opportunities among the rural

poor, which would also hurt their access to food. In this line of argument, there would not be more availability (there is a one-for-one displacement), but the price of food would be lower. In that case, consumers may benefit, in particular the poorer ones for whom food is a large percentage of their expenditures, but rural producers and rural workers would suffer. Then overall poverty and food insecurity may increase as a whole if the aggregate benefits for poor and food-insecure consumers (many of whom may live and work in rural areas) are lower than the aggregate losses for rural producers and workers. On the other hand, overall poverty and food insecurity may decrease if the benefits to the former are larger than the costs to the latter.

On the other hand, it may happen that the increased food imports are simply expanding and supplementing the availability of food without displacing domestic production, offering consumers additional supply that is not available domestically (or that would be available only at higher costs for the economy and increased prices for consumers, negatively affecting access).

The discussion about these effects may focus on trade expansion alone, trade policy (as in trade liberalization), or WTO trade policies. In the latter case, and considering only the AoA, part of the debate centers on whether the WTO framework allows developed countries to subsidize production and exports in ways that displace agricultural and food production in developing countries, while restricting the policy space in the latter to support and expand their own agriculture.

Changes in the Structure of Production: Cash Versus Food Products

Another disputed link is between trade and trade policies, on the one hand, and production diversification, on the other. A debate with a long history is whether expansion of trade, international as well as domestic, may be shifting production patterns at the local level in a way that privileges cash/export/nonfood products, which would then displace food production for family consumption, with negative impacts on food and nutrition security.

An alternative view is that expanded trade allows for the expansion of production, which may get more diversified but without a decline in traditional food crops, eventually allowing for the production of new foods. The latter would be a plus in terms of nutrition security given the link between positive anthropometric nutrition indicators and dietary diversification, as mentioned before.

Changes in Agrarian Structure

Even if there are no displacements of domestic food production by imports or changes in domestic production away from food crops, other debates have focused on what may be happening at the level of the productive structure supporting domestic production. A particular issue that has received special attention is the potential impact of trade and trade policies in the balance involving large commercial, family, and small farms, as well as landless peasants and workers, within the agrarian structure of developing countries. Some criticisms of trade relate to potentially negative impacts on that agrarian structure, such as the expansion of “industrial agriculture” (a term used with a negative connotation) at the expense of “peasants.” The argument has also been made that many smallholders producing food are women, and therefore trade that displaces domestic production would also have negative gender effects (IANWGE 2011).

A negative scenario would point up the difficulties, due to lack of access to land, technology, and other resources, of small and poor producers, particularly women, in participating profitably in the enlarged domestic or international markets generated by trade expansion. These limitations on participation in the opportunities offered by trade may, depending on the evolution of wages and employment on the labor markets, lead to the possibility of worsening income distribution, but not necessarily to increases in absolute poverty.

A more worrisome scenario would be if the poor become worse off absolutely, not only in relative terms. Usually those who argue the likelihood of this undesirable outcome believe that the expansion of market opportunities may shift relative prices against the poor, reduce productive and income-generating opportunities for them, increase the competitive advantage of large firms, or reinforce

the power of already dominant actors (such as large landowners and big commercial enterprises), allowing them to extract further incomes from the poor or to expropriate their assets, such as land or access to water, through different methods.

These are not new arguments and have emerged before in the context of different developments such as the Green Revolution, the increase in commercialization, and now the expansion of international trade and, more generally, the process of globalization (Díaz-Bonilla, Thomas, and Robinson [2003] have discussed some of the issues involved). There are also gender aspects of this argument that will be expanded below. It includes as well the perennial debate about the competitive advantages of large versus small farms (see, for instance, Deininger and Byerlee 2011). Finally, the debates include a renewed attention to land tenure issues, as manifested in the concerns around what has been called *land grabbing*.

These are empirical issues that need to be considered, starting with the recognition that agrarian structures are far more complex than the dichotomy of “industrial agriculture” versus “peasants”: they include a variety of commercial and family farmers, as well as landless workers and vulnerable rural groups, whose fate has to be taken into account as well.

Changes in Product and Input Market Structures, Global and National

This discussion takes place at several levels. At the more general level some have argued that global production has become more concentrated. This may lead to more vulnerability for world consumers regarding food availability, if the supply in some of those producing regions is compromised. On the other hand, a well-known argument is that expansion of trade would help smooth availability and prices in volatile domestic markets, helping consumers (Abbott 2010; OECD 2013).

A different issue is how competitive (or contestable) product and input markets are. Even if production is not as concentrated globally as some argue, the commercialization and processing channels may be getting in the hands of fewer and larger agents. However, the main questions in the context of the issues discussed here are (1) what the welfare consequences would be for producers and consumers if markets are becoming more concentrated, and (2) what the influence of trade or trade policies would be in that process. And those questions can be asked at the level of global, national, and local markets.

In general, the usual view from economists is that expanded trade tends to reduce the market power of dominant actors, which would lead to a larger supply and lower prices. On the other hand, critics tend to paint a picture in which the dominant position of key market players along the whole value chain would be reinforced by trade expansion and specific trade policies, which they argue would have negative impacts on food availability and prices.

Volatility in Availability and Price

The stability of production and prices for food consumption relates to the fourth component of the notion of food and nutrition security. The debate in this regard is whether international markets or domestic markets are more volatile in terms of production and prices, and therefore whether reliance on trade increases or decreases volatility in domestic availability and prices.

Channels Affecting Stable Access to Food and Related Issues

Stable access can be analyzed at the country/nation level and at the household/individual level. At the national level, access depends on variables such as domestic income or GDP, trade, external financing (including remittances), and foreign reserves. At the household level, access to food depends on the relationship between household incomes (broadly defined) on the one hand and the cost of the minimum household food requirements (MHFR) on the other. In order to assess economic access to food, all sources of income and food costs must be considered (Sinha, Lipton, and Yaqub 2002). Therefore in the case of households, the analysis of access, although it involves a comparison of food prices with wages, must go beyond that; it also requires the consideration of all income sources and costs, covering incomes

from production (prices and quantities), wages, employment, and other incomes in general (including from public safety nets), and food prices and other variables on the cost side.¹⁰

Availability influences MHFR, but this is only one aspect of food and nutrition security, while access is affected by incomes, poverty, and income distribution.¹¹ An implication is that if a policy measure increases the cost of MHFR, this, keeping other things constant, would increase both the poverty head count and the number of food-insecure households among those that are net food buyers. However, other things may not be constant, and the general impacts of trade and trade policies on production, employment, wages, and the other components of incomes and costs must be factored in, both in the short term and in the medium to long term.

Growth, Employment, Wages, Poverty, and Income Distribution

Trade policies, as well as other macroeconomic policies and events, may affect the rate and variability of overall growth, as well as its “quality” (that is, the employment, income distribution, and poverty effects of such growth). There is a large literature and a variety of perspectives on the relationship between different trade policies, growth, income distribution, and poverty, some of which will be mentioned later.

Besides growth in general, it may be important to consider its sectoral composition. Agricultural and food production growth generate broad employment and income opportunities that are crucial for food access (the second component of the notion of food security). To the extent that poverty is the main cause of food insecurity, then agricultural growth, which seems to have particularly positive effects on poverty alleviation, contributes to reducing food insecurity through this channel as well.¹² Agricultural growth, with its multiplier effects in the rest of the economy, also helps with overall growth.

Broad employment and income opportunities, along with adequate food prices and low inflation, define economic access (the second component of the definition of food security). Therefore, much depends on the level, inclusiveness, and stability of the growth rate generated by the expanded trade and new trade policies. While poverty in the developing world declines rapidly with growth that is at least neutral in terms of income distribution,¹³ episodes of growth that are accompanied by strongly worsened income distribution may reduce or wipe out the income gains for the vulnerable groups (Lipton and Ravallion 1995), affecting their food and nutrition security.

The issue is whether better results in terms of growth, poverty reduction, and income distribution are achieved through more trade and trade openness, or less.

¹⁰ At the individual level within households, there may be a problem of access if food is divided unequally among household members (perhaps to the disadvantage of girls and women in the family).

¹¹ In this regard it should be noted that besides the obvious link between poverty and food insecurity, noted in the 1943 UN Conference and revived by Sen (1981), there is also a definitional link: the general poverty line is usually the cost of MHFR, with an additional mark-up representing other expenditures (and the line for indigence is usually only the cost of MHFR with minimal or no additional expenditures). Therefore, poverty and food insecurity measures based on consumption of calories should move closely together by statistical construction. However, there are differences in the sources of data and methodologies for the poverty and food insecurity indicators that somewhat weaken the empirically observed links between those two measures.

¹² Several studies have shown that not only is agricultural growth pro-poor in reducing poverty or increasing the income growth of the lower quintiles of the income distribution, but it also seems to have larger effects on poverty reduction than growth in other sectors (see, for instance, Lipton and Ravallion 1995; Eastwood and Lipton 2000; and Christiaensen, Demery, and Kuhl 2010). The exceptions to these results appear in developing countries with large inequalities in landholdings, where agricultural growth appears uncorrelated with poverty reduction (Eastwood and Lipton 2000). Also, the correlation weakens with increases in a country's income (that is, in richer countries, agricultural growth does not have stronger effects on poverty reduction when compared with other sectors).

¹³ The meaning of “neutral” has also been debated. Some studies consider neutrality in rates of change: if the incomes of the poor and food insecure, but also those of the nonpoor and food secure, grow at the same rate (say 10 percent), these analyses would call that growth “neutral.” The ratios of high to low quintiles or deciles do not change if all are growing at the same rate. However, if inequality is considered in terms of the gap in absolute terms, the difference across groups is permanently increasing. For instance, if the poor have an income of 2 units of currency and the nonpoor of 8 units, the absolute difference is 6 units and the ratio is 4. If the income of both groups grows at 10 percent per year, at the end of the period, the poor would have 2.2 units, and the nonpoor 8.8 units, for an absolute difference of 6.6, even though the income ratio is still 4.

Growth Volatility and Crises

Earlier we discussed stability regarding food *availability*; here the focus is on stability of *access*, related to potential volatility in overall incomes and employment, particularly in the case of the poor and vulnerable. Even with distributionally neutral growth at reasonably high rates, if income variability increases as well, generating a greater likelihood of crises, then the poor may face significant additional downside risks.¹⁴ Higher unemployment—and its persistence over time generated by economic crises—may compromise the limited productive and human capital of the poor if, for instance, assets such as livestock must be sold to help small-scale farmers face economic shocks, and if children are taken from school to help support the family (Lipton and Ravallion 1995). Improvements in health, nutrition, and education indicators are usually slowed or reversed by a crisis, with negative medium- and long-term impacts on the human capital of the poor, which contribute to the persistence of poverty (Dercon and Hoddinott 2005).

Some of those crises involved episodes of hyperinflation or very high inflation, which have been accompanied by large increases in poverty and food insecurity (see Díaz-Bonilla 2008a, 2015b). These episodes are related to more general macroeconomic policies, rather than trade policies per se (although there are some links, as discussed in Díaz-Bonilla 2015b).

Crises can also worsen income distribution, making it more difficult for the growth recovery to reduce poverty (Lustig 2000). Declines in the human capital of the poor also affect the performance of the economy, which is an economic justification for the provision of publicly funded safety nets (Lustig 2000).

Again the debate is whether overall economic stability and the steadiness of incomes and employment are helped by more trade and trade openness, or less.

Trade and the Food Import Bill

Some analyses have expressed concerns about the increasing food import bill of developing countries, particularly the poorer and more vulnerable ones among them (a problem of access at the country level). These concerns are in many cases based on measures of food import bills expressed in absolute nominal terms. The question, however, is to determine whether that food import bill is becoming more or less affordable relative to the evolution of other nominal variables such as national incomes or total exports, as discussed later.

Channels Affecting Food Utilization and Related Issues

Figure 4.4 also emphasizes the fact that what matters, in the end, is the impact of policies at the individual level (which in the figure is labeled “Nutrition security”). Availability and access at all times are only preconditions for adequate utilization of food. They do not determine unequivocally malnutrition (or nutrition insecurity) at the individual level (Smith 1998; Smith and Haddad 2000). Analyzing food and nutrition insecurity at the individual level seems to require the consideration of other factors, as shown in Figure 4.4. Some of these channels are mentioned immediately following.

Trade and Health

Regarding trade and health, the main issues discussed have been related to (1) the impact of intellectual property rights (IPR), as codified in the WTO agreement on TRIPS (the Trade-Related Aspects of Intellectual Property Rights); (2) the impact of import taxes and trade restrictions on the availability and affordability of drugs and medical equipment and inputs; and (3) the potential impact of GATS (the

¹⁴ For instance, for the poor and food insecure it would be better to grow, say, for five years at 4 percent (which would imply a GDP increase of about 22 percent), than in the same five-year period to grow for three years at 8 percent and then suffer growth declines in the other two years amounting to the same overall GDP increase over the period. The asymmetry for the poor and vulnerable is related to the fact that they may not have enough assets and resources in general to weather the downturn without compromising their future, as discussed in the main text.

General Agreement on Trade in Services) on the ability of governments to operate public health systems and health insurance programs. This enumeration shows that the links between trade (in its different connotations) and health issues cover a large set of issues, most of which are beyond the scope of this paper and will not be pursued further here (see a more detailed discussion in Díaz-Bonilla, Babinard, et al. 2002, 2003).

Trade and Diversification in Production and Diets

Another link is between trade and trade policies, and production diversification and dietary change. The debate about cash/export crops versus food crops has been already mentioned. A second issue is related to whether expanded trade could result in the acceleration of a major shift in the structure of diets, resulting in a growing epidemic of the so-called “diseases of affluence.” In this line of thought some would argue that traditional low-cost diets, rich in fiber and grains, may be replaced by high-cost diets that include greater consumption of sugars, oils, and animal fats, giving rise to increasing rates of overweight, obesity, and associated chronic diseases that affect children and adults alike (Hawkes 2008).

Trade and Gender Issues

A separate issue is the effect of trade and trade policies on women. Women play a crucial role in agricultural production and food security (World Bank, FAO, and IFAD 2009; FAO 2011; Quisumbing et al. 2014). They are important producers of food (thus contributing to availability, the first component of food security), even though the claim that they produce 60–80 percent of global food seems to be incorrect (Doss 2014). Still, women make up somewhat more than 40 percent of the global labor force in agriculture, although with differences between a low of about 20 percent in Latin America and the Caribbean (LAC) and 50 percent in Africa south of the Sahara (SSA) (Quisumbing et al. 2014; FAO 2011). And they have been shown to be as productive farmers as men when they have access to similar levels of productive resources (Quisumbing et al. 2014; FAO 2011).

Women also contribute to household incomes (and thereby to food access, the second component of food security) through a variety of economic activities, on- and off-farm, in rural and urban settings. However, women’s potential contribution to production, employment, and incomes is limited by a variety of constraints and discrimination they suffer in access to land, inputs, credit, labor opportunities with just pay, education, and other factors (Quisumbing et al. 2014; FAO 2011).¹⁵

Finally, women are crucial in food utilization, the third component of food security, through a variety of activities they perform within households, including, among others, nursing babies, preparing food, and providing health and nutritional care at home. Therefore, gender issues are at the core of health and nutrition conditions, particularly among the poor. The good health of women is key to the health status of families, women generally being the main care providers for children and the elderly. Health problems may occur at different stages of the life cycle of individuals, but they usually begin at the mother-child level and then persist throughout life. The status and empowerment of women has been found to be an important determinant of the anthropometric measures of nutrition in household members, particularly children (Smith and Haddad 2000). Also important is the level of women’s incomes considering that they tend to have spending patterns more in line with the needs of children and vulnerable people in the household (but there may be a trade-off as well between income-generating activities and the time women have to dedicate to care practices for children and others). In this regard some have debated the impact of commercialization and trade expansion on women’s ownership of land and productive resources, as well as the potential change in the mix of cash and food crops.

Overall, the debate is whether trade increases women’s capacities and autonomy, or rather affects them negatively.

¹⁵ It has been argued that women’s weaker property rights in land and other resources, and a rigid gender division of labor, not only have limited the gains that women may get from expanded trading opportunities, but may be also a reason for Africa’s feeble agricultural supply response to export opportunities (Fontana 2009).

Channels through the Operations of Government

Another important channel of influence for trade policies (and the rest of the macroeconomic policies and events in Figure 4.4) is through the operation of governments, and the quality and efficacy of governance. Government policies, expenditures, taxes, regulations, and other interventions influence all four components of food security. The question is whether trade, in some of the various definitions, affects the operations of governments in ways that help or hinder food security.

Díaz-Bonilla (2008b) differentiated two dimensions of governance that may be affected by international economic integration in general, and trade and trade policies in particular. A first dimension is government's responsiveness to the needs of the people in a country, linked to institutional issues such as the advance of democracy, transparency, and the rule of law. A second dimension is government's effectiveness in the design and implementation of policies and programs, particularly those in support of rural and agricultural development, and food and nutrition security, as well as its ability in general to respond to the needs of its citizens in a more internationally open economy.

The effectiveness of governance has in turn two aspects that may be affected by trade as defined in some of the possible ways discussed in Section 2. One is whether there are legal and institutional constraints related to international trade agreements and frameworks (such as that of the WTO) that limit the range of possible policies to be implemented (*policy space*), also limiting the ability of countries to respond to economic crises brought about by increased trade integration. In general, in this vision, global trade integration would constrain the capability of governments to address the issues that the electorate demands, limiting government's responsiveness to the needs of the citizenry and even weakening democracy itself.

The other aspect of effectiveness is the availability of resources: whether trade and trade policies may impact on government revenues, directly in the operation of the tax system and indirectly through the impact of the rate and quality of growth on general tax collection.

Obviously, a government's policy space, operational capabilities, and level of revenues all have important implications for all components of the definition of food and nutrition security. The provision of public goods and investments that enable food and agricultural production, combined with appropriate trade policies, helps ensure food availability and prices (which influence the first and fourth components of the definition of food and nutrition security). Also, governments can and should implement and properly manage safety nets for the poor and vulnerable, such as food subsidies or other poverty-oriented programs (which influence access and stability, the second and fourth components of the definition of food and nutrition security). General expenditures and investments in basic health services, water and sanitation systems, education, housing, and related areas facilitate the proper utilization of food (the third component of the notion of food security).

In conclusion, some have argued that the rising importance of international trade and finance, combined with increasing supranational accords, rules, and regulations, may reduce the economic and political autonomy and effectiveness of national governments. Section 5 will discuss some empirical analyses of alternative views on these issues.

Other Channels?

Some have argued that the expansion of trade may increase emissions of greenhouse gases, which contribute to climate change. In turn, this may aggravate the short-term occurrence of extreme weather events (with their impact on the stability aspect of food security) and generate medium- to long-term overall conditions that affect production (with its impact on availability). These topics exceed the scope of this paper and will not be discussed here.

5. BRIEF REVIEW OF EVIDENCE REGARDING SOME OF THE CHANNELS DISCUSSED

Empirical evidence, analyzed with adequate methods, is needed to evaluate the issues raised in Section 4, from the claims that trade and trade liberalization help food and nutrition security to the assertions of critics about trade “causing hunger,” displacing domestic production, hurting small-scale farmers and women, and having other negative effects. This section will comment on evidence related to the several hypotheses presented in Section 4 without presuming that the large list of empirical studies on each issue is fully covered here. Before discussing some of the available empirical evidence, this section cautions about the need to consider the relevant contextual and structural issues, both when designing and implementing specific policies, and when trying to interpret particular developments and outcomes. The next subsection comments briefly on different methodological issues that arise in the design and evaluation of policies.

The following subsections look at empirical evidence, the first focusing on direct analyses of trade policies and trade reform in relation to food security, without considering the specific channels. The rest of Section 5 discuss some of the main channels presented in Section 4.

Contextual and Structural Issues for the Analysis of Trade and Trade Policies, and Food and Nutrition Security¹⁶

The impacts and outcomes of trade policies, as is the case for any government intervention, will depend on a series of contextual variables, discussed next.

First, it is necessary to consider *prevailing domestic conditions* in the country analyzed. For instance, the impact of a policy will be different if the domestic economy is close to full employment, compared with the impact in conditions of considerable underutilization of human, capital, and natural resources.

Second, it is important to consider the *structural aspects* of the domestic economy, both in general and in relation to the agricultural sector in particular. Some of these aspects are relatively fixed, at least within a certain period (say, 5 to 10 years). For instance, how important is the agricultural sector for domestic GDP, employment, and international trade? What is the country’s demographic profile?

Structural aspects such as land distribution (and in the short to medium term, rural infrastructure) may be crucial as well in determining the effects of a policy: reducing (or increasing) agricultural tariffs in a country with relatively equal land distribution and good infrastructure is more likely to have very different outcomes than in a country with unequal land holdings and bad infrastructure.

Given longer periods of time, however, many structural factors may change due to policy adjustments, endogenous developments, or exogenous events. In fact, development is a process of structural transformation, in the composition of both employment and production. The demographic profile in terms of age structure and rural/urban composition also changes over time, as well as the structure of land tenure. Therefore, an aspect to consider is the phase of agricultural development a country may be in (see Timmer 1988; Dorward et al. 2004).

In general, at the point in time when policymakers and analysts in developing countries must assess the impact of specific trade policies, they can avoid many faulty conclusions by being aware of the structural conditions in their countries.

Third, individual trade policies (or any policy for that matter) must be considered within the *country’s whole economic program*, as noted in Section 2. Their impact cannot be analyzed individually without a clear reference to the entire economic program (explicit or implicit) of which they are a component. For instance, it was mentioned that a reduction of agricultural tariffs will have different impacts on a country depending on, among other things, whether it is done unilaterally by that country or is the result of a multilateral exercise, and whether it happens only for those products or includes other

¹⁶ This subsection is based on Díaz-Bonilla (2015b).

nonagricultural products and services as well. Further, agricultural liberalization will have very different impacts if the exchange rate has been allowed to appreciate (that is, become less competitive) or if the process takes place with more depreciated/competitive exchange rates.

Fourth, any policy with economywide impacts (such as trade policies and, basically, all macroeconomic policies) will have *differentiated impacts on households and firms* because of the diversity of those economic agents. Such heterogeneity needs to be considered in general, but specifically for food security and poverty alleviation, which take concrete form at the household and individual levels. Therefore, a general policy operating at the economywide level may be a blunt instrument with which to address food security and poverty problems at the individual level, and more differentiated policy approaches may be needed.

Finally, the *evolution of the global economy*, considering both trends and cycles, affects a country's performance in general and that of its agricultural sector in particular. Domestic trade policies may have different effects depending on prevailing international economic conditions. These conditions include indicators of the global business cycle, such as whether or not the global economy is growing; whether world interest rates and world agricultural prices are high or low; the evolution of the exchange rates of major global currencies; and the level, composition, and direction of international capital flows. Other factors refer to more sustained trends, such as the increasing integration of the world economy through the expansion of trade, finance, labor, and information flows.

In summary, to analyze the impact of specific trade policies on the economy in general and on agriculture and food security in particular, it is important to consider (1) current domestic conditions, (2) the totality of the economic program, (3) structural aspects of the domestic economy and society, (4) the heterogeneity of economic agents, and (5) the world economic environment. Many analytical mistakes result from analyzing isolated trade and macroeconomic policies without considering the five aspects mentioned here (Diaz-Bonilla 2015b).

Methodological Approaches

Even if everybody agrees on (1) the meaning of food and nutrition security and how to measure it, (2) the meaning of trade and how to measure it, and (3) what the main links are between the two concepts, there is still the issue of assessing empirically the impacts and outcomes from trade to food and nutrition security. In this regard, another source of discrepancies is the nature of the techniques utilized to analyze economic and social processes. In empirical analysis of specific policies it is necessary to use adequate methodologies that try to isolate the impact of the policy being evaluated from the variety of other factors that may influence the observable outcomes.

There are different approaches, some more adequate than others: (1) unstructured anecdotes (almost amounting to simple assertions about something that happened or did not happen); (2) structured case studies (usually considering before/after but not with/without the policy changes or events considered); (3) a variety of single- and multiple-equation econometric analyses; (4) partial equilibrium models; (5) multimarket models; and (6) general equilibrium, economywide, and macroeconomic models.

Usually academic analysis and international organizations tend to apply statistical and econometric approaches to comprehensive datasets, trying to control for exogenous factors and to clearly identify the impact of the policies or events of interest. Some of those approaches (such as case studies and econometric analyses) are based on historical data, trying to understand what has happened (ex post analysis). Another approach uses simulation models that can be utilized both for counterfactual analysis of historical events (ex post analysis), and to try to simulate future changes (ex ante analysis).

On the other hand, some critics of trade in nongovernmental organizations and civil society seem to rely on (mostly unstructured) case studies and individual stories to present their arguments, which tend to be before-and-after stories with difficult attribution of causality. In between, there are different types of structured case studies, with predefined methodologies that try to identify channels of influence and determine causality. While the econometric and simulation approaches may miss the historical, political, and institutional context, case studies, especially those that are more like unstructured anecdotes, may

suffer from selection bias, and therefore would not be representative and may fail to provide an adequate view of the general trends and potential counterfactuals.

Discrepancies in results and interpretations from quantitative analysis when compared with unstructured case studies or anecdotes are not surprising. But even within the quantitative tradition and methodologically careful case studies there may be differences in results and policy prescriptions because it is difficult to isolate specific policies from the variety of contextual and structural factors mentioned in the previous subsection. In this regard, a general recommendation for policymakers and analysts in the design, implementation, and evaluation of policies is “know the country and its circumstances.”

Reviews of Trade and Food Security

In 2002, the FAO conducted a thorough exercise of case studies for 15 countries¹⁷ to analyze trade-related reforms and food security (Thomas 2006). The study noted that trade-specific policies were usually immersed in policy reforms including other macroeconomic aspects (such as exchange rate and fiscal and monetary policies) and microeconomic and institutional issues (including privatization or reform of public-sector enterprises related to the agricultural sector). Also, those reforms happened at different times, their pace was dissimilar, and they included reversals of policies. Therefore, it was not always easy to make a clean attribution of results to the trade policies considered (see the two previous subsections).

Still the review presented several relevant results. First, it decomposed price changes, finding that exchange rates, in combination with world prices, seemed to be key determinants of final domestic prices. In other words, macroeconomic issues, rather than trade policies per se, seemed to influence the results. Second, although food imports increased in nominal terms, the impact on the ratio of food imports to total exports minus debt service¹⁸ was more varied, decreasing or staying the same in seven countries and increasing in eight (Thomas 2006, Table 18). A related result, common in many studies with a similar focus, was that agricultural exports became more diversified after trade liberalization, which reduced some of the risks for the country’s export revenues. Third, comparing the average production per capita of calories in the period 1999–2001 (“post reforms”) with that of the two previous periods, 1980–1982 and 1990–1992, the indicator increased in eight countries and declined in four against both periods, with three countries showing mixed results depending on the period of comparison (but two of the latter showed an increase of the last period, 1999–2001, compared with 1990–1992; that is, they were recovering in the last period). For proteins, eight countries had increases in the last period when compared with the previous two, three countries had declines against both “pre-reform” periods, and four countries had declines against one period and increases against the other (with three countries showing increases in the last period) (Thomas 2006, Table 16).

Fourth, and going to the main point, the results were also varied regarding indicators of undernourishment (using the FAO measure) and poverty, but with a predominance of positive outcomes, as shown in Table 5.1 (from Thomas 2006, Table 17). The percentage of undernourished people declined in 11 countries and increased in 4, while the incidence of poverty declined in 9 countries and increased in 3 (in 3 countries one period or the other lacked data; in Senegal in particular, there are no data for both periods).

¹⁷ The countries included were China and India in Asia; Chile, Guatemala, Guyana, and Peru in LAC; Morocco in North Africa/Near East; and Cameroon, Ghana, Kenya, Malawi, Nigeria, Senegal, United Republic of Tanzania, and Uganda in SSA.

¹⁸ The ratio includes the payment of the debt service, which although important in financial terms, does not allow the isolation of pure trade effects: the ratio may have changed not because of variations in food imports or total exports, which would be trade effects, but also because of changes in debt levels and interest rates, which would reflect influences other than trade. The specific trade effect is discussed in a later subsection of Section 5.

Table 5.1 Indicators of food security

Country	Percentage of undernourished		Change, in percent	Percentage of rural poverty		Change, in percent
	1990–1992	2000–2002		Early 1990s	End of 1990s	
Africa						
Cameroon	33	25	-8	59.6	49.9	-9.7
Ghana	35	13	-22	63	49	-14
Kenya	44	33	-11	46.3	59.6	13.3
Malawi	49	33	-16	-	66.5	na
Nigeria	13	9	-4	48	76	28
Senegal	23	24	1	-	-	na
Tanzania	35	44	9	41	39	-2
Uganda	23	19	-4	59.4	39.0	-20.4
Morocco	6	7	1	18	27	9
Asia						
China	17	11	-6	32.9	3.2	-29.7
India	25	21	-4	30.1	21.0	-9.1
Latin America						
Chile	8	4	-4	39.5	23.8	-15.7
Guatemala	16	24	8	-	-	na
Guyana	21	9	-12	45	40	-5
Peru	40	13	-27	70.8	64.8	-6

Source: Thomas (2006).

Note: na = not available.

More recently, McCorrison and colleagues (2013) undertook a comprehensive review of different studies of trade liberalization and food security. They first reviewed 1,176 articles that potentially focused on the link between trade liberalization and food security, but after further selection only 34 studies fit the criteria established for consideration.¹⁹ The studies used both ex ante simulations and ex post econometric analyses. Some of the reviewed studies covered individual countries, while others undertook a global analysis with a variety of developing countries.

McCorrison and colleagues concluded that of the 34 studies, 13 reported improvements in the food security indicators utilized, 10 showed declines, and the other 11 had mixed results, “with food security metrics varying across segments of the population, regions and time or with alternative food security metrics indicating different outcomes for specific countries” (2013, 2). The authors speculated these reasons for the mixed results: (1) trade liberalization involved a variety of policies, and the studies analyzed different trade policies (from reduction of import tariffs alone to export measures, domestic support, or other measures); (2) trade liberalization (in various definitions) was usually part of a broader policy program of reforms; (3) a variety of metrics were used to define food security outcomes; and (4) the initial conditions of the countries’ economies were very different.

¹⁹ The criteria included a first cut based on issues such as whether the research referred to at least a developing country, focused on trade liberalization, included an outcome measure of food security, and was written in English; a second cut tried to ensure that the evidence relevant for the systematic review question was captured in the studies selected, and points were given considering “whether the aims were clear, whether the methodology was clear/appropriate, whether an appropriate food security metric was isolated, whether the authors comment[ed] on potential mechanisms, whether controls were used or counterfactuals analysed, whether the findings were clear, and whether the paper contributed to the synthesis” (McCorrison et al. 2013, 22).

Taking these caveats into account, it seems useful to look more closely at the type of food security indicators and the specific instruments considered in the studies covered by McCorriston and colleagues (2013). For instance, regarding indicators of food security, some studies utilized only food self-sufficiency indicators, while others focused, more appropriately from the point of view of the impact on households and individuals, on indicators related to food consumption and malnutrition.²⁰ Regarding trade liberalization, some studies referred to exchange rate policies (which affect trade but are not trade policies), some referred to measures related to export subsidies (which are not usually considered when the term “trade liberalization” is used), and some did not define the trade policies under consideration. Therefore, a relevant question is what the outcomes would be if the studies were limited to those that fit two criteria: first, they use indicators of food security linked to malnutrition/consumption/availability, and second, they focus on trade policies that reduce taxes and controls on imports, which is a more common notion of “trade liberalization.” This second criterion would exclude those studies that consider nontrade policies that do not explain what trade policies are considered, or that focus only on export subsidies and the like. If these two adjustments are implemented, then a somewhat more positive picture emerges regarding the link between trade and food security.

Two of the studies with mixed results would now show positive results on the food security indicators of interest,²¹ while 4 of the studies with negative results did not apply trade liberalization policies in the sense defined above. Therefore, the breakdown would now be 15 studies with positive results (the original 13 plus the 2 studies newly reclassified), 6 with negative (because 4 were excluded from the original negative 10 studies as mentioned), and 9 with mixed/inconclusive results (the original 11 minus 2 that moved to positive results).

Other studies, such as OECD (2013) (which summarized extensive work done at the Organisation for Economic Co-operation and Development by Jonathan Brooks and colleagues) and Gillson and Fouad (2015) (which was based mostly on World Bank work), take a generally positive view of what trade liberalization can do for food security, using a variety of indicators.

Are Food Imports Displacing or Complementing Domestic Production?

As noted, according to some narratives, growing food imports are displacing domestic production in many developing countries, and farmers, discouraged by those food imports, are producing less, which leads to more imports in a vicious cycle. An alternative view would argue that, overall, trade is complementing rather than displacing domestic production: increases in incomes and population in developing countries are fueling food demand, and imports help to expand domestic availability (the first component of food security).

What do the data suggest? In general it is a fact that developing countries as a whole, and also in specific categories such as LDCs, NFIDCs, and LIFDCs,²² moved from being net food exporters (using the FAOSTAT definition of food) in the 1960s and 1970s to becoming net food importers, and increasingly so, since the 1980s and 1990s. Of course, there is some heterogeneity across developing regions (for instance, LAC has maintained a consistent net food surplus) and across countries, as shown in Table 5.2 (from Valdés and Foster [2012], who utilized a more restrictive definition of food than FAOSTAT but the same definition of agricultural products).

²⁰ If self-sufficiency is achieved through protection, then the domestic price increases, leading to more production but less consumption. If consumption is decreasing because of achieving self-sufficiency, then the latter is an inadequate indicator for food security.

²¹ For instance, one study was considered as having mixed results because there were declines in self-sufficiency although at the same time there was a rise in food consumption (which is what should count for nutrition); and the other was considered mixed because production of the main staple (maize) declined but supply of food nutrients in general increased. Here both are considered as having positive results for the indicators of interest.

²² Least-Developed Countries (LDCs) is a category defined by the United Nations Assembly. Net Food-Importing Developing Countries (NFIDCs) was a category defined during the Uruguay Round of negotiations and incorporated into the current legal system of the WTO. Both have some legal implications for economic aid and trade negotiations. Low-Income Food-Deficit Countries (LIFDCs) is a statistical category that the FAO uses to present some data.

Table 5.2 Net trade in developing countries

Type of trade	1995–1999	2005–2009
	% developing countries	
Net food importing	81.2	81.6
Net food exporting	18.8	18.4
Net agricultural importing	56.9	68.6
Net agricultural exporting	43.1	31.4

Source: Valdés and Foster (2012).

Note: The sample is between 136 and 138 countries.

It is clear that a large and somewhat increasing percentage of developing countries fall in the category of net food importers, and a smaller but increasing number are net agricultural importers.

A different, and probably more adequate, indicator of the impact of trade is the ratio of food imports over total agricultural production (which, following Díaz-Bonilla and Reza [2000], can be called the “import penetration ratio”) and a similar ratio for food exports over total agricultural production (the “export orientation ratio”) (see Table 5.3, where the indicators have been calculated for LDCs, NFIDCs, and LIFDCs).

Table 5.3 Import and export ratios to total production

Category		1980– 1989	1990– 1999	2000– 2009	2010– 2013
Export orientation ratio					
Least-Developed Countries	Agriculture	0.131	0.103	0.083	0.090
	Food	0.082	0.095	0.050	0.045
Low-Income Food-Deficit Countries	Agriculture	0.109	0.109	0.132	0.147
	Food	0.063	0.066	0.085	0.094
Net Food-Importing Developing Countries	Agriculture	0.220	0.174	0.152	0.162
	Food	0.144	0.130	0.106	0.113
Import penetration ratio					
Least-Developed Countries	Agriculture	0.146	0.154	0.192	0.204
	Food	0.128	0.132	0.163	0.171
Low-Income Food-Deficit Countries	Agriculture	0.105	0.102	0.136	0.154
	Food	0.092	0.087	0.115	0.130
Net Food-Importing Developing Countries	Agriculture	0.236	0.234	0.257	0.272
	Food	0.213	0.204	0.218	0.228

Source: Author’s calculations from FAOSTAT (2015).

Several points should be noted in regard to Table 5.3. First, agricultural integration in the world markets (at least measured by adding these simple trade ratios) has increased on the whole since the 1980s. Second, the levels and trends of import and export ratios differ somewhat among these groups of countries. While import penetration ratios have been increasing in all three groups, the export orientation ratio has been declining in LDCs and NFIDCs (which indicates that they are keeping more production for

domestic consumption), while LIFDCs have somewhat increased their export ratios.²³ The third point is that the increases in international agricultural and food trade notwithstanding, domestic production for domestic utilization is the dominant characteristic of the agricultural sector of developing countries as a whole.²⁴ For instance, only between 5 and 16 percent of total production is exported (based on the export orientation ratios). The percentage of domestic production in total agricultural and food consumption is presented in Table 5.4. Those percentages go from about 66 to 72 percent in NFIDCs to some 74 to 82 percent in the other two groups of countries.

Table 5.4 Domestic production as percentage of total consumption, 2010–2013

Country category	Product category	% of consumption
Least-Developed Countries	Agriculture	75.6
	Food	81.6
Low-Income Food-Deficit Countries	Agriculture	73.9
	Food	80.2
Net Food-Importing Developing Countries	Agriculture	65.9
	Food	72.2

Source: Author's calculations from FAOSTAT (2015).

Note: The calculation is $(1 - \text{export orientation ratio})$ divided by $(1 + \text{import penetration ratio})$.

At the same time that there has been more agricultural and food trade in general, production per capita in basically all developing regions has increased as well. Figure 5.1 shows the index of food production per capita. The aggregate of all developing countries (“Low- and Middle-Income Countries” in the definition of the World Bank) and all regions shown (which include only developing countries) had levels of production per capita during 2010–2013 that were above the production levels of the previous periods. Some regions, such as SSA and the group of LDCs,²⁵ have recovered from the lows in the 1980s and 1990s. The rest of the regions and groups show continuous growth in per capita terms.

²³ In terms of developing regions (see Díaz-Bonilla and Robinson 2010; Díaz-Bonilla 2015b), which are not shown in Table 5.3, SSA had the largest export/production percentage during the 1960s (28.5 percent), but it has declined since then, standing during 2000–2009 at less than half the initial value (13.2 percent). SSA's import/production percentage, on the other hand, climbed from 8 percent at the beginning of the period to almost 14 percent during 2000–2009. Asia has the lowest agricultural export and import ratios, although both have been trending upward slowly. LAC has become, by the indicators mentioned here, the more integrated region in world agricultural markets, surpassing SSA on both export and import ratios. Obviously, these import and export ratios differ by product: crops and byproducts tend to have larger trade ratios than livestock and dairy products (Díaz-Bonilla 2015b).

²⁴ There are exceptions, including city-states, small island countries with large tourism inflows, oil-producing countries with very limited land, and countries affected by war and civil strife.

²⁵ The group of LDCs includes a large percentage of SSA countries.

Figure 5.1 Evolution of food production per capita

Source: Author's calculations using FAOSTAT (2015).

Notes: Index of food production per capita; 2004–2006 = 1. The height of the bars cannot be compared across regions; the only meaningful comparison is across decades within the same region. There are no data for Europe and Central Asia in the 1960s and 1970s.

Therefore, as a whole, in developing countries there is more food production (total and per capita) as well as more trade than in the past. This fact is in general more compatible with the hypothesis that increases in income and population are leading to both more food production and more trade, rather than the notion that there is more trade because domestic production is being displaced.

A way of assessing causality is to apply a Granger test using change in production and change in trade. The test is whether a change in imports in the past (say year $t - 1$, $t - 2$, and so on) is associated with changes in current production in year t , or whether the reverse causality is true (that is, changes in past production are associated with changes in current imports). Table 5.5 shows the results of the test. It also explains how to read the names of the variables, which include agriculture versus food, production versus imports, and what group of countries is considered.

Table 5.5 Causality between production and imports of agricultural and food products in LDCs, LIFDCs, and NFIDCs

Null hypothesis:	Obs	F-statistic	Prob.	
AGPRLDC does not Granger-cause AGRIMLDC	49	6.80789	0.0122	*
AGRIMLDC does not Granger-cause AGPRLDC		2.96663	0.0917	
FOODPRLDC does not Granger-cause FOODIMLDC	49	11.0226	0.0018	*
FOODIMLDC does not Granger-cause FOODPRLDC		3.40112	0.0716	
AGPRLIFDC does not Granger-cause AGIMLIFDC	49	4.44061	0.0406	*
AGIMLIFDC does not Granger-cause AGPRLIFDC		0.39071	0.535	
FOODPRLIFDC does not Granger-cause FOODIMLIFDC	49	4.18421	0.0465	*
FOODIMLIFDC does not Granger-cause FOODPRLIFDC		0.40710	0.5266	
AGPRNFIDC does not Granger-cause AGIMNFIDC	49	0.08624	0.7703	
AGIMNFIDC does not Granger-cause AGPRNFIDC		0.71425	0.4024	
FOODPRNFIDC does not Granger-cause FOODIMNFIDC	49	0.89128	0.3501	
FOODIMNFIDC does not Granger-cause FOODPRNFIDC		0.41782	0.5212	

Source: Author's calculations using data from FAOSTAT (2015).

Notes: AG = agricultural products; FOOD = food products; PR = production; IM = imports; LDC, LIFDC, and NFIDC refer to the three groups of countries, respectively Least-Developed Countries, Low-Income Food-Deficit Countries, and Net Food-Importing Developing Countries. Therefore "AGPRLDC" means agricultural production in LDCs; "FOODIMLIFDC" means food imports by LIFDCs, and so on. Test: Pairwise Granger causality. Sample: 1960–2015. Lags: 1. The variables measure the changes in production and in imports as the difference in natural logarithms between year t and $t - 1$. The null hypothesis is that neither variable at time $t - 1$ affects changes in the other variable at time t . If the null hypothesis is rejected, then the variable at time $t - 1$ is affecting the other one at time t . The values of production and imports are the aggregates for agriculture, on the one hand, and food (FAO definition), on the other, corresponding to each category of countries: LDCs, LIFDCs, and NFIDCs. The results reported are for the effect at one-year lag (the impact from $t - 1$ to t), but further lags ($t - 2$ and so on) show similar results. * indicates cases where the rejection of the hypothesis of no causality occurs at least at a significance of 5%.

The tests indicate that the causality runs from changes in production to changes in trade, for both agricultural and food products in LDCs and LIFDCs, while the reverse causality, from imports to production, is not supported by the data. This is compatible with the view that trade has a stabilizing effect in LDCs and LIFDCs: if production declines due to exogenous shocks, such as droughts or other natural disasters, then countries utilize more imports to stabilize domestic consumption, while if the production increases because of very good weather or some other nontrade causes, then imports decline.²⁶ In the case of NFIDCs, the tests cannot reject the null hypothesis of no causality in either direction: production is not affecting imports as in the other two cases, nor are imports displacing production, as claimed by the critics of expanded trade.

Are Food Imports Becoming an Excessive Economic Burden in Developing Countries?

The fact, already noted, that more developing countries are becoming net importers of food and agriculture has led to some concerns about the economic sustainability of that trend. For instance, according to FAO data, food imports from LDCs between 1992 and 2011 increased by about fivefold (and somewhat less than fourfold until 2008). However, some have argued that being a net food importer

²⁶ The full equation on which the test is based (not shown here) clearly shows that changes in production are negatively correlated to changes in imports, while the reverse is not true.

is not a good indicator of food access at the country level (see Díaz-Bonilla, et al. 2000).²⁷ The main question is how big the nominal food import bill is compared with total exports, overall income or GDP, or some other metric that indicates affordability, that is, the economic potential to buy those increased food imports. For instance, some developing countries, such as Belize, Burundi, Cameroon, Sri Lanka, Guatemala, Guyana, Kenya, Nicaragua, Guinea-Bissau, Uganda, and Ethiopia, are all net food exporters (using FAOSTAT's definition of "food") but still have high food import bills of 15 percent of exports or more (average 2010–2012), a value above the average of about 10 percent for comparable countries in the same period. On the other hand, countries such as Angola, Chad, Congo, Azerbaijan, Equatorial Guinea, Gabon, Kazakhstan, Malaysia, Nigeria, Turkmenistan, and China are all net food importers, yet the value of food imports is less than 5 percent of total exports for the period.

Figure 5.2 shows that while the food import bill increased in LDCs, total exports from those countries jumped much more. So the countries' ability to pay for those imports has also increased in the aggregate thanks to the overall expansion of trade. The same can be shown in the case of NFIDCs and LIFDCs, where that ratio has been declining significantly.

Figure 5.2 Food imports and total merchandise exports for LDCs, US dollars, billions

Source: Author's calculations from FAOSTAT (2015).

Table 5.6 shows the declining ratio for most of the different developing regions included (with the exception of Southeast Asia and Oceania).

²⁷ In any case, analysts concerned about the net trade position should also scale that value by other variables such as, again, total exports or GDP, to get an adequate sense of the burden. But if this is done, using net food trade would show smaller burdens in absolute values than using total imports, which would still give a better sense of the economic implications of the food import bill (as argued in Díaz-Bonilla, I. 2000). For instance, let us assume that a country's total exports are 100 units in value, with 80 units that are nonfood exports and 20 that are food exports; and that food imports are 30 units. Then the ratio of imports/total exports is 0.3 (or 30 percent) and the net food trade value is -10 (20 - 30). Calculating the net food trade ratio in absolute value, this would be $10/80 = 0.125$ (or 12.5 percent), which gives a more benign view of the cost of buying food in terms of the country's exports (12.5 percent against 30 percent for the total food import ratio).

Table 5.6 Value of food imports over total merchandise exports

Region	1990s	2000–2007	2008–2010
World	6.2	5.0	5.0
Developing regions	6.9	4.7	5.0
Africa	14.1	10.4	10.0
North Africa	21.2	12.3	13.0
Africa south of the Sahara	10.9	9.5	9.0
Asia	5.2	3.7	4.0
Caucasus and Central Asia	19.4	6.7	7.0
East Asia	3.7	2.6	3.0
East Asia (excluding China)	4.3	3.1	3.0
South Asia	11.1	7.6	7.0
South Asia (excluding India)	15.8	10.5	11.0
Southeast Asia	4.4	4.1	5.0
West Asia	9.2	5.5	6.0
Latin America and the Caribbean	9.8	6.9	6.0
Caribbean	23.6	22.1	21.0
Latin America	8.8	6.6	6.0
Oceania	17.1	17.8	19.0

Source: Díaz-Bonilla (2015b), based on FAOSTAT (2015).

Figure 5.3 shows the food import bill as a percentage of the GDP for LDCs and LIFDCs. With some oscillations, the food import bill has stayed relatively flat as a percentage of total GDP.

Figure 5.3 Food imports as a percentage of gross domestic product in LIFDCs and LDCs

Source: Author's calculated calculations from FAOSTAT (2015) and World Bank's World Development Indicators (2015)

Notes: LDCs = Least-Developed Countries; LIFDCs = Low-Income Food-Deficit Countries.

Overall, and contrary to the arguments of unsustainable increases in imports, aggregate data for many developing-country regions and categories show declines, or at least stability, in the relative burden of the food import bill compared with merchandise trade or GDP, even during the two recent price shocks. However, there are some countries for which the burden of food imports is still high; these need particular consideration.²⁸

Is Trade Leading to More Volatility in Availability?

Table 5.7 shows that, except for butter and marginally for beef, production at the global level is more volatile than consumption for the whole period, suggesting that trade (and stocks) helps stabilize consumption. If the calculation is disaggregated by period, volatility in production and consumption declined from the period 1970–1994 to the more current 1995–2010. In particular, volatility of consumption has been smaller during the current period, in which trade has increased.

Table 5.7 Average variability for production and consumption

Period	Production	Consumption	Production	Consumption	Production	Consumption
	Wheat		Rice		Maize	
1970–2010	5.19%	3.48%	3.93%	3.42%	7.28%	5.02%
1970–1994	5.71%	4.42%	4.42%	4.18%	8.14%	5.32%
1995–2010	4.37%	2.03%	3.16%	2.24%	5.95%	4.54%
	Soybeans		Sugar		Beef	
1970–2010	10.11%	8.30%	4.84%	3.83%	3.12%	3.15%
1970–1994	10.97%	9.01%	4.70%	4.29%	3.72%	3.61%
1995–2010	8.77%	7.20%	5.07%	3.10%	2.19%	2.44%
	Whole milk powder		Butter		Soy oil	
1970–2010	6.63%	6.45%	6.06%	6.15%	9.26%	8.64%
1970–1994	7.91%	7.37%	4.12%	4.22%	10.06%	9.05%
1995–2010	5.04%	5.76%	9.09%	9.16%	8.00%	7.99%

Source: Liapis (2012).

Is Trade Changing the Composition of Production Away from Food Crops and Toward Cash Crops in Ways That Affect Food Security?

Many studies have analyzed whether the expansion of trade may be shifting production patterns at the local level in a way that privileges cash/export/nonfood products, which then would be displacing food production for family consumption, with negative impacts on food and nutrition security (see von Braun and Kennedy [1994] for a discussion of trends in the 1980s and early 1990s; a recent review of different studies is in Achterbosch, van Berkum, and Meijerink [2014]).

A first point to be noticed is that some cash crops are also food crops and may be exported as well (Achterbosch, van Berkum, and Meijerink 2014). A second point is that small-scale farmers tend to operate with a mix of products (including small animals and larger livestock on a small scale) rather than completely specialize in a single crop.

In general, the studies of the interaction between cash and food crops tend to paint a more positive view of the processes involved, usually showing improvements for the poor and food insecure due to production and employment effects.

²⁸ Out of about 200 countries and territories included in the FAOSTAT database, about 38 percent have a food import bill exceeding 20 percent of total exports. In more than half of those cases, the countries and regions with high relative import bills are those in special situations, such as small island countries where revenues from tourism (not included in the ratio) finance the food bill, countries with international receipts from services not counted in merchandise trade, and countries affected by war and violent domestic conflict. But even discounting those cases, there are still countries with food import bills above 20 percent of total merchandise exports.

The comprehensive study of the impact of expansion of cash cropping on nutrition by von Braun and Kennedy (1994) in several developing countries,²⁹ although not all included international trade, showed that in general staple food production per capita was maintained or increased in the cases studied even though cash crops expanded. Also, overall household incomes increased, which resulted in more food purchased at the household level. At the same time, it has been generally recognized that uniform attainment of benign outcomes was by no means guaranteed, with some case studies showing counterexamples to the positive impacts of commercialization (von Braun and Kennedy 1994; IFAD 2001).

Other studies for several countries in Africa have shown that poverty fell more among export crop producers than among staple producers (Christiaensen, Demery, and Kuhl 2010; see also Kherallah et al. 2002).

The recent review by Achterbosch, van Berkum, and Meijerink (2014) summarized a variety of studies by noting that “cash crop production enables farmers and farm workers to increase their living standards, thus contributing to food security. Moreover, and perhaps more importantly, the production of cash crops offers farmers opportunities for investment and improving management of their farms, stimulating agricultural innovation and increasing yields” (2014, 7). Therefore, more income from cash crops and better technologies may also lead to more production of food by farmers. The authors recognized that, as in all agricultural production, there are different types of risks that need to be managed. Therefore, governmental policies must play a role in supporting the risk-coping strategies of small-scale farmers. But if trade expansion leads to higher incomes and more diversification, this would help with both risk management and nutrition.

Minten, Randrianarison, and Swinnen (2009) presented two cases in which that positive result took place. One was in exports of fruits and vegetables to Europe from Madagascar under contract farming with high standards of production. The participants increased from some 100 farmers in 1990 to about 10,000 small-scale farmers in 2005. Productivity of rice (the staple crop not included in the value chain) increased by 70 percent due to technology spillovers; the length of the lean period for food availability was reduced by 2.5 months, comparing contract farmers with those without contracts (1.7 months with contract versus 4.3 months without contract). In fact, the contract farmers interviewed about why they wanted to enter into those contracts mentioned as main reasons the stable income during the year, access to inputs on credit, learning of new technologies, and access to a source of income during the lean period (Minten, Randrianarison, and Swinnen 2009).

Another example is the expansion of biofuels based on castor oil in Ethiopia, where authors found a significant adoption rate in a few years of promotion, penetration of the castor crop into inaccessible and remote places, diversification of crops, and fertilizer use 70 percent higher than before, helping with both castor and food crop productivity. All this led to higher household income and significant improvement of food security, as measured by the “food gap,” which was reduced from 47 days to 30 days (Negash and Swinnen 2012).

Overall, empirical analyses do not support arguments that, as a general rule, trade is changing the composition of production away from food crops in ways that affect food security; rather, although with exceptions, empirical studies show more positive effects linking trade, export crops, and food security.

Is Trade Leading to More Concentration in Production in World Markets?

Some have expressed concern about whether expanded trade has led to the concentration of production in just a few countries, perhaps reflecting some static comparative advantages or specific policies in support of agriculture. Table 5.8 presents an indicator of concentration, the Herfindahl-Hirschman (HH) index, for a variety of products over several decades. A lower number of the HH index indicates less concentration.

²⁹ The countries included were Guatemala, Kenya, the Philippines, Gambia, and Rwanda; Papua New Guinea, Malawi, and Zambia were considered, although with less detail.

The table shows that the concentration of production in world markets for most commodities has been, in general, *declining* considering both exporters and importers, particularly when the period 2000–2009 is compared with the 1970s and 1980s.

Table 5.8 Concentration in production

Product	Herfindahl-Hirschman index							
	Average 1970–1979		Average 1980–1989		Average 1990–1999		Average 2000–2009	
	Exporters	Importers	Exporters	Importers	Exporters	Importers	Exporters	Importers
Wheat	0.27	0.05	0.22	0.06	0.17	0.0	0.11	0.04
Maize	0.44	0.08	0.45	0.08	0.38	0.07	0.28	0.05
Rice	0.19	0.04	0.18	0.03	0.14	0.03	0.14	0.02
Raw sugar	0.20	0.23	0.17	0.05	0.12	0.04	0.09	0.02
Refined sugar	0.18	0.05	0.17	0.05	0.12	0.04	0.09	0.02
Meat (bovine)	0.10	0.13	0.08	0.09	0.090	0.08	0.08	0.06
Butter	0.14	0.19	0.13	0.09	0.10	0.08	0.09	0.05
Milk	0.11	0.05	0.13	0.06	0.10	0.05	0.09	0.03
Soybeans	0.77	0.11	0.64	0.09	0.	0.09	0.34	0.16
Soybean oil	0.25	0.06	0.16	0.05	0.16	0.05	0.21	0.06

Source: Liapis (2012).

Are Land Tenure Structures Showing More Concentration?

Another concern is whether trade expansion and trade liberalization are leading to more concentration of land structures. The competitive pressures of a more open economy may require concentration of land in larger farms to take advantage of economies of scale. Also, there is the question of whether opening trade would lead to instances of “land grabbing,” displacing smaller-scale farmers. On the other hand, import protection, which is basically a transfer of income per unit of product from consumers to producers, would benefit larger farmers more than smaller ones (given that the larger ones produce more), and this unequal distribution of incomes may give larger producers the resources to buy out and displace smaller ones.

The evolution of the agrarian structure is related to the relative advantages and disadvantages of commercial/large versus family/small farms, which are associated to a variety of factors, many of which may be unrelated to trade and trade policies per se. Commercial/large farms may have advantages of scale, such as in the case of some plantation crops, or benefit from better access to credit and markets, sometimes due to government policies. But in general, worldwide agricultural production still shows a significant presence of family and small farms. The latter appear to have the incentives better aligned to adjust to local variations of quality of natural resources, climate, and marketing conditions, due to the use of family labor. Reduction of poverty would also be more associated with the strengthening of family farms (Deininger and Byerlee 2011).

Recent developments, however, may have affected those comparative advantages. Deininger and Byerlee characterized those new factors as follows: “(i) new technology that makes it easier to standardize and/or monitor farm operations; (ii) increased consumer demand for social and environmental standards and certification even for traditional low value commodities; and (iii) a desire to expand cultivation into previously uncultivated areas where, in the absence of immigration, labor is scarce” (2011, 3). These developments may increase the advantages of large farms and of vertical integration in the value chain. The presence of large farm operators in Latin America and SSA is rekindling the debate about comparative advantages of different types of farms.

Some of the trends, however, do not have to bias the agrarian structure in favor of large farms. For instance, different technological innovations, such as information technology, are not necessarily scale biased and can be utilized by small-scale farmers to coordinate their efforts in stronger cooperatives or other organizations for collective action (see, for instance, Chong, Galdo, and Torero 2009). It may also happen that the comparative advantage of large farms comes from policy biases that favor them and

not because of inherent economic advantages over small and family farms: for instance, large farms may benefit from access to finance and public goods, including agricultural research and development (R&D) and infrastructure that small and family producers may lack.

Also, deficient governance of land markets, leading to situations in which the rights and land titles of small-scale farmers and native communities are not registered and protected, and state land is not clearly demarcated and allocated, appear to be more relevant issues to consider than trade policies for the development of equitable agrarian structures.

Therefore improving land rights and governance, and eliminating policy biases in favor of large farms, are essential to maintaining a level playing field for small and family farms, under any trade policy. The future scenarios will depend, then, not only on the inherent competitive advantages of family/small farms based on family labor and local knowledge but, crucially, also on public policy that monitors concentration of land and protects from “land grabbing” while defining and implementing adequate public programs in support of small-scale farmers and family farms (Deininger and Byerlee 2011).

These are critical issues that must be addressed irrespective of the stance of trade policies.

Issues Related to the Operation of Relevant International and Domestic Markets Affecting Food Systems

Even if international production has become less concentrated, as shown above, a separate issue is whether the international and domestic markets for the commercialization and processing of those products are becoming less competitive. Further, the level of competition in markets for inputs, such as seeds, fertilizers, machinery, and so on, also matters for agricultural and food production.

Echoing the early work of Servan-Schreiber (1968) and Vernon (1971), some observers have argued that opening the economy increases the power of multinational corporations to the detriment of the welfare of citizens and democratic governance. On the other hand, others have noted empirical observations that indicate a positive association between greater economic openness and increases the level of competition, reducing the market power of concentrated firms (see Hallward-Driemeier 2001).

Several concerns have been voiced about what has been perceived to be an increasing concentration in many of the agricultural and food production markets (Murphy 2008; Morrison and Murphy 2009) and the implications those developments may have for food security and the poor.

Those are relevant empirical issues that encompass several components. The first issue is the level of analysis (global, national, or local markets) and the focus (primary products, processed products, inputs, consumer retail goods, and so on). The second question is a factual one regarding whether markets are indeed becoming more concentrated or not. The third and key question, though, refers to the consequences of such a concentration in welfare terms for producers, consumers, workers and other stakeholders, and in particular, food security. Markets may still be “contestable” even though quantitative measures of concentration increase, and this fact limits the potential for firms to abuse their apparently dominant positions. While changes in concentration are easier to measure, the welfare consequences of those changes are more difficult to determine and cannot be inferred by simply pointing at concentration measures. Finally, in the context of this paper, the main issue is the role of trade and trade policies in the developments related to the three previous questions.

Answering those questions is particularly difficult considering the new global context of complex value chains and networks of suppliers, the consolidation of firms in many industries, the advance of supermarkets, and the use of private standards.

The current global agrifood system is large and complex: more than 450 million farmers worldwide (of whom about 85 percent operate on 2 ha or less) buy inputs, equipment, and machinery from a variety of industrial firms and then supply their products to an intricate network of processors, traders, and retailers, which in turn face a market with about 7 billion potential consumers worldwide (although more than 1 in 10 of these potential consumers lack purchasing power and suffer from undernutrition) (von Braun and Díaz-Bonilla 2008). Transactions and trade occur across all the

components of those value chains, which have become more integrated at a global scale, with big players in each one of their segments. Foreign direct investment in agriculture, processing, and retail (supermarkets) has increased the level of global integration in agrifood markets. Some of the players in those segments include important state trading enterprises and large private firms that operate, both domestically and internationally, under market structures with different degrees of imperfect competition. Supermarkets are fast expanding into developing countries, changing how the food value chains operate there (Reardon and Timmer 2012), including the rapid increase in private standards and food safety and quality requirements, which may make other public policy frameworks (such as WTO's Agreement on the Application of Sanitary and Phytosanitary Measures) less relevant.

Therefore the discussion about concentration, welfare effects, and the role that trade may play needs to clearly identify the level (global, national, local) and focus (type of good or service) of analysis. A traditional preoccupation has been the role of big multinational corporations in *global markets of primary products*. Some studies (see, for instance, Murphy, Burch, and Clapp 2012) have pointed out the dominant presence of the four big commodity traders Archer Daniels Midland (ADM), Bunge, Cargill, and Louis Dreyfus. At the same time, Murphy and others considered that “while the four major, and long-serving, trading companies still maintain a dominant position in the world trade in grains, oilseeds, sugar, and other commodities, it is arguable that now, for the first time, they are facing a degree of competition from a number of new trading companies, most of which have only recently been established” (2012, 39). The authors go on to list some of those new companies. Also, as argued before, the crucial issue of characterizing market behavior must go beyond a simple numerical determination of concentration.

On the *input side*, Fuglie and others (2011) showed that concentration in *global markets* increased in several important industries (crop seeds and biotechnology, crop protection chemicals, farm machinery, animal breeding and genetics, and animal health) from 1994 to 2009, using the HH index and four-firm and eight-firm concentration ratios. Also, they found that at least in the United States, the prices of agricultural inputs have been increasing with respect to the prices of farm products, although they noted that this trend is not corrected for quality of goods and services supplied and the implications of their improvements for productivity.

The global agrifood system is also experiencing changes in R&D and intellectual property rights in ways that may affect farmers in developing countries and the ability to conduct agricultural research there, although opinions are divided (see, for instance, Pardey and Wright 2001).

On the *processing side at the national level* there is a variety of circumstances. Figure 5.4 shows differences across countries in Africa in the participation of different international and domestic firms in the market for agrifood products.

Figure 5.4 Market share of top five agroprocessing companies in selected African countries

Source: UNDP (2012), based on Euromonitor International data.

The levels of concentration vary but do not seem to approach levels considered conducive to exercising monopoly power (greater than 45–50 percent). On the other hand, the chart refers to agrifood products in general, while some of the firms may have dominant positions in specific products. Still, there is the possibility of substitution in consumption across goods, which reduces monopoly power for producers of individual goods.

The impact of concentration also has to be compared with a counterfactual: what the situation of poor households would be without the presence of the dominant firm. For instance, Maertens, Colen and Swinnen (2011) analyzed *production for export* in Senegal (of cherry tomatoes). It would seem a clear-cut case of trade expansion affecting food security: it is a poor country, producing a cash crop under very high standards, through a monopoly that does not contract with outside farmers (small or large) but produces directly on its own land. Still, the authors reported that in the area of production, where almost 40 percent of the households (about 3,000 workers) are employed by the firm, households with members employed by the monopoly have total incomes (of which somewhat more than 50 percent come from wages) that are more than double those of the households in the area that are not employed in that value chain.

At the *local level*, market power conditions may differ even further depending on a variety of factors, which may be unrelated to trade. Just as an example, many have identified the crucial role played in the staple markets in many SSA countries by what have been called “market queens,” powerful women who are the heads of trade associations that set prices and market conditions, and manage disputes (Awo 2012; UNDP 2012; KIT and IIRR 2008).

Regarding *consumer goods* at the *national level*, Reardon and Timmer (2008, 2012) analyzed changes in food markets, focusing particularly on what they called the “supermarket revolution.” They noted that those changes are driven by multiple factors (not only trade), such as urbanization, increases in incomes, changes in lifestyles and women’s participation in the labor force, liberalization of foreign direct investments in developing countries, high competition in industrialized countries, the increasing use of refrigerators and other domestic appliances in developing countries, and changes in information technology that allow a better organization of supply chains. The changes in domestic markets these

authors documented are transforming trade patterns, particularly if much of food trade takes place within those large multinational organizations.

The authors found that consumers across the globe (in both developed and developing countries) have benefited, in terms of lower costs and a larger variety of products,³⁰ from the highly competitive supermarket supply chain (they find that the markets have been very competitive, or at least contestable, because of the need to increase market share to achieve the requisite economies of scale). However, these competitive pressures have resulted in increased pressure for farm producers to supply higher-quality goods at lower prices. The changes in the retail sector may therefore have mixed or negative effects on farmers: the investments and organizational adjustments to meet the volume, cost, quality, and consistency standards may be challenging for many farmers and processing firms, particularly small ones. Still, Reardon and Timmer (2008, 2012) cited studies showing that under certain circumstances, small-scale farmers are included in procurement systems of large-scale agroprocessors and supermarket chains, particularly in fresh food items such as fruits and vegetables, although they tend to be the upper tier of that group of producers in terms of physical, human, and organizational capital.

In turn, Swinnen (2015) reviewed case studies in different countries and geographical settings where an increasing number of small and poor farmers are included in supply chains, playing a crucial role in technology transfer and productivity growth, with implications for positive direct and indirect effects on food security. This is contrary to the view that quality standards and the strategies of dominant companies in value chains have led to the marginalization of small and poor farmers, with negative effects on welfare and poverty. Even in cases where small-scale farmers are not directly included, Swinnen (2015) found, there can be improvements in poverty and food security through other channels (such as employment).

In other cases, the *public sector* plays a larger role in processing and commercialization. For instance, McCorriston (2015) noted the large role of state-owned enterprises in the operation of sugar mills in Kenya, Vietnam, and Bangladesh, where they hold dominant market positions. Regarding consumer goods there is the case of India's Targeted Public Distribution System (TPDS), the largest food system of its type in the world, having reached some 600 million people considered food vulnerable or undernourished. India's National Food Security Act of 2011, expanded and revised in 2013, will increase this coverage to about 800 million people. Reardon and colleagues (2012), in their analysis of rice distribution in several Asian countries, noted that fair-price shops in India's TPDS handle about 15 percent of the rice consumed in New Delhi, whereas the incipiently expanding supermarkets are already reaching 7 percent of consumption (though customers in those two types of retail outlets may differ). But at the same time, according to surveys conducted in New Delhi, fair-price shops were closed during business hours in about two-thirds of the cases. This shows that public food distribution systems confront their own challenges associated with waste and losses because of inadequate storage, handling, and transportation; leakages of funds and products; and diversion of food from the poorest members of the society.

In summary, global agrifood value chains are very complex; therefore, when discussing market power and concentration it is important to define the level of analysis and the focus. Furthermore, even if quantitative measures of concentration at the properly defined level and with adequate focus on the good or service considered appear to be increasing, the relevant questions are what impacts on the welfare of consumers, producers, and workers result from those developments, and what the role of trade and trade policies is in that process. For instance, it is important to determine whether concentration has led to more economies of scale and specialization, reducing costs for all, or whether such concentration has generated abuse of market power by international or domestic companies, leading to increased margins to the detriment of final consumers, primary producers, and workers. Also concentration and vertical integration may be the only way that a value chain can become competitive and able to offer production and employment opportunities in a country or region.

³⁰ A different issue is the nutritional impact, as discussed later.

At the same time, monopolies may well exist because of a public policy that, directly or indirectly, grants such powers (such as discretionary import licenses or domestic trade licenses and restrictions). In that case, the adequate approach would be to eliminate the policy-induced monopoly/monopsony. If on the other hand, the monopoly (or monopsony) power has its origin in market imperfections (as opposed to a policy-induced imperfection), then the proper approach is to establish adequate anticompetitive regimes and regulatory approaches to eliminate abuses.

In any case, the presence of large players in different segments of those value chains highlights the need to pay attention to the relative market power of different actors, in both product and input markets (see, for instance, the discussion of imperfect competition in the global fertilizer industry in Hernandez and Torero [2011]; also, Reardon and Timmer [2008] highlighted the need to pay attention to the relative power of price formation between supermarkets and processors, and to explore price formation in oligopsonistic or oligopolistic settings).

Therefore, developing countries will have to strengthen domestic policy and legislation (such as antitrust laws) to govern monopolistic structures. There is also a parallel international challenge if the horizontal and vertical integration of the agrifood system makes the global system less competitive. At minimum it would be useful to improve the information about competition issues related to the international agrifood system. Efficient functioning of the global agrifood system may well need an internationally agreed-upon framework for competition policies in the future (for different views on these issues, see von Braun and Díaz-Bonilla 2008).

How Does Trade Affect Growth, Poverty, and Income Distribution?

The link between trade policies and economic performance in developing countries has been a hotly debated topic in development literature for a long time.³¹ Several studies during the 1970s and early 1980s pointed out the limitations of a development strategy based on inward orientation and closed trade regimes, with its tendency to generate macroeconomic imbalances and recurrent balance-of-payment crises and to foster low-employment and capital-intensive growth patterns, with their negative impact on poverty (Little, Scitovsky, and Scott 1970; Balassa 1971).

During the 1990s, with increasing availability of cross-country datasets, a variety of empirical studies applied regression analysis to measure the impact of trade on income growth, poverty, and distribution. Those studies generated a far-ranging debate about their results, methods, and interpretation. Although a clearly attributable link between trade liberalization and income growth has been difficult to establish, many agree that foreign trade played an important role within the overall policy package in nearly all countries where high income growth has been sustained over time (a point that even critics of the growth-regression approach acknowledge; see Rodriguez and Rodrik 1999). In that vein, Sala-i-Martin (2002) summarized some of the early results, noting that although there is no simple determinant of growth, more open economies do tend to grow faster. The Commission on Growth and Development (2008, 2010) organized by the World Bank, also known as the Spence Commission, which has been the latest large-scale effort to analyze development experiences, has argued that countries with successful growth stories have been those that, among other things, fully exploited the trade and financial opportunities offered by the world economy.

Regarding trade and poverty (with the impact of the latter on food insecurity), Winters, McCulloch, and McKay (2004) and Winters and Martuscelli (2014) reached the conclusion that trade liberalization generally increases incomes and leads to reductions in poverty, although they noted studies that raise questions regarding the general application of that conclusion in very poor countries. They also noted that most studies suggest that trade liberalization has very heterogeneous effects on poor households, depending on the type of policies being changed, different complementary conditions, such as the ease with which factors of production can move between activities, and where the poor work (with

³¹ For early reviews of this topic see Kravis 1970 and the rejoinder by Crafts 1973. A more recent review of the trade, growth, and poverty links can be found in McCulloch, Winters, and Cirera (2001).

those working in export industries generally benefiting while those working in import-competing sectors that were protected before the trade liberalization episode getting hurt). Their review also suggests that women may gain relatively more from trade liberalization (based on industrial studies; see later discussion of agriculture).

Still, empirical studies appear to leave many open questions regarding the links between openness, growth, poverty, and inequality, and results vary with either equation specification or the choice of openness indicators. As discussed before, this indetermination may be due to the diversity of country experience and the multiple dimensions of trade policies and open/closed regimes. What is at least as important is the way in which changes in trade policies interact with a given country's initial situation and concurrent changes in domestic policies, also discussed before. It is this interaction that may produce divergences in country experiences, even when fairly uniform trade policies are adopted. Even those who strongly support and encourage openness policies acknowledge that there is not a "magic bullet" for growth and poverty alleviation, and that trade policy is only one of many determinants of growth.

All in all, while there are grounds to be skeptical about claims that trade liberalization always induces a strongly pro-poor growth, it seems even more dubious that retreating into isolation from global markets will help the poor in developing countries.

Is Trade Leading to More Volatility in Growth and Incomes?

Earlier we discussed whether trade makes food *availability* more volatile or less. The issue here is the impact of trade on volatility of growth, incomes, and employment, which affects stable *access* to food. As argued before, even if trade accelerates growth, the poor may suffer if that growth becomes more volatile and the likelihood of crises increases, with negative impacts on their incomes, employment, and livelihood strategies.

The debate over whether open or closed economies are more vulnerable and volatile also has a long tradition in development circles. After experiencing the volatility and breakdown of world markets during the two world wars and the Great Depression, many developing countries turned to inward-oriented policies with the hope of reducing external vulnerability. Different studies during the 1970s and 1980s that looked at the performance of the closed economies of several developing countries concluded, paradoxically, that countries following inward-oriented policies appeared more prone to macroeconomic instability and more vulnerable to external shocks and balance-of-payment crises, while those following outward-oriented policies showed better results not only in terms of efficiency but also regarding flexibility and adaptability to external events (Balassa 1984, 1986).

An important reason for economic instability was that the inward-oriented strategy created a stop/go dynamic in economic activity: the acceleration of the economy usually led to fewer exports (because a larger percentage of the goods was consumed internally due to growing incomes) and more imported inputs and capital goods (demanded by the expanding industry), generating balance-of-payment crises when official external reserves reached very low levels. In addition, compressing imports through import substitution meant that exports also declined. The result was that these economies ended up with very little diversification on the export side (that is, the country ended up selling a small range of goods). And because the import substitution industrialization was never able to replace some of the most crucial and difficult-to-produce goods, those countries ended up being very dependent on the import side, buying a narrow group of nonsubstitutable imports that were crucial for the operation of the economy. All this, rather than achieving the desired reduction in vulnerability to any external shock on the export, import, or financial side, appeared to have increased external vulnerabilities (Balassa 1986).

Besides the external vulnerability, at the internal macroeconomic level, import-substitution protectionism appeared to have increased inflationary pressures (Krueger 1980, 1984) and fostered unsustainable fiscal deficits associated with state interventions, which led to recurrent macroeconomic crises.

This debate took place in the context of inward-oriented industrialization. The question is whether a policy of isolating the agricultural sector from world markets may have similar destabilizing systemic effects on that sector and eventually on the whole economy, as has happened in the case of isolating the industrial sectors. There is a line of thinking that considers international agricultural markets as unreliable and suggests that domestic food production should be expanded to some level of “self-sufficiency” so that countries can depend less on external sources.

This approach, however, must consider the fact that, as discussed before, domestic production in individual countries is far more volatile than global and regional aggregates. As shown in Table 5.4, most of the food consumed in developing countries is produced domestically, making food trade a complement that can provide the margin of supply necessary to stabilize food prices and quantities. Thus, using international trade to supplement domestic production should in fact stabilize domestic food availability. Although some developing countries have successfully managed external volatility, there are likely more examples of efforts to shield domestic markets from global volatility that in fact led to increased internal volatility. For instance, Minot (2011, 2012) has shown that (1) food price volatility in several countries south of the Sahara seems higher in domestic markets than in international markets; (2) such domestic food price volatility has not changed much with the increases in international price volatility that happened late in the previous decade; (3) commodities that are more traded internationally have lower volatility than those less traded; and (4) volatility is higher in countries and for commodities where governments intervene actively in markets through state-owned enterprises (see also Chapoto and Jayne [2009], who showed the destabilizing results of government interventions aimed at stabilizing maize prices in several SSA countries). All this would suggest that “self-sufficiency” as insurance against food insecurity may increase, rather than decrease, vulnerability to external and internal fluctuations.

There are also economywide effects when governments try to compensate consumers through food subsidies for the costs of higher prices due to protection, and these transfers become a heavy budgetary burden (Díaz-Bonilla 2015b). An example was Morocco during the second half of the 1990s: the country was spending about 1.7–2.4 percent of its GDP on food subsidies (IMF 2001), in part trying to compensate for the higher prices generated by trade protection. At the same time, simulations of alternative uses of water in Morocco showed that the protection of certain crops was shifting the use of water, a scarce resource, toward protected products, even though the value of agricultural production measured at world prices would increase if protection were reduced and water were reallocated to other crops (Diao, Roe, and Doukkali 2002). Moreover, concentration of production in some protected crops seems to have increased the vulnerability of the country’s agriculture to droughts. This in turn made the whole economy more volatile (World Bank 2001).

Trade and Gender

Section 4 highlighted the importance of women for all aspects of food and nutrition security. As noted, there are differing views about the impact of trade and trade policies on women’s well-being. One narrative argues that women are the main producers of food at the global level, and that trade liberalization, by affecting domestic food production, is hurting women and endangering food security. Even if trade expansion leads to additional production opportunities for women, in what are considered to be “female crops,” women may not be able to take advantage of those opportunities because of lack of access to land and productive resources. And if they do participate in the expanded production and employment opportunities, this may happen at the expense of their time to care for children and other household members, endangering nutrition. Or the additional work burden may fall on younger women and girls, affecting their schooling.

A different narrative would argue that expanding trade generates further income and employment opportunities for women; that, usually, expansion of cash crops does not displace food production but rather provides resources to expand the latter (as discussed in the subsection on the composition of production); and that women, empowered with additional incomes, are able to improve the nutritional status and other human development indicators of the household, considering that women tend to have

more family-oriented expenditure patterns than men. Additionally, improvement in women's demonstrated income-earning capability would strengthen the incentive for investment in the human capital of girls, with all the wider benefits that the education of girls brings.

The reality, of course, is complex and shows a variety of outcomes. Analyzing the relatively limited empirical studies on these topics requires us to consider several points. A first problem is the general lack of gender-disaggregated data (Quisumbing et al. 2014). Analysis based on whether the household head is male or female obscures the fact that a male head may have a female partner (whose presence is then not taken into account) while the reasons for female-headed households differ (a household with an absent male who sends remittances is different from a widow-headed household). Also, although there are some gender patterns of cropping, the distinction between "male" and "female" crops, given the complex patterns of collaboration within families, is not so clear as to map from it what would be men's and women's incomes (Doss 2014). This has implications for the factual validity of a narrative based on men's producing cash crops for export and women's producing food for domestic consumption.

Second, "women," as much as "men," is not a uniform category. Women differ among themselves depending on their wealth, status, education, skills, and age. For instance, the power of "market queens" in the commercialization of many food crops in SSA has been already mentioned (Awo 2012; UNDP 2012; and KIT and IIRR 2008). There are also different prevailing social norms regarding women's role and obligations in households, with mothers of infants less likely than those with older children or single women to be able to respond to new opportunities (Fontana 2009).

Third, most of the analyses of the impact of trade on women have focused on manufacturing, while a smaller number of studies exist for agriculture and even fewer for services. However, that is the inverse order in which women are employed globally: according to IANWGE (2011), based on 2008 data from the International Labor Organization (ILO), there were 3 billion people employed worldwide, of whom 1.2 billion (about 40 percent) were women, and the distribution of employment of women was about 16 percent in industry, 37 percent in agriculture, and 47 percent in services (compared with about 27 percent, 33 percent, and 40 percent, respectively, for men).

The comprehensive study on commercialization (which includes domestic expansion of trade) and nutrition by von Braun and Kennedy (1994) in several countries showed increases in incomes, in general, for both men and women. Women, however, did not play a significant role in management decisions and had less direct control on incomes from the new crops, compared with men. Still, women's incomes increased, and this increase had a positive impact on food intake at the household level. Some time has passed, however, since those studies were conducted.

Paolisso and others (2001) looked at rural Nepalese women's time to care for other household members in the face of increased production and exports of fruits and vegetables, and found that there may be trade-offs between income-generating activities and the time allocated for childcare, with the number and age of children in the family affecting how women take advantage of production and employment opportunities. Another potential trade-off, which this study does not analyze, and on which little is known in general (Fontana 2009) is whether there may also be redistributive impacts of time across women of different ages within the household: for example, when some of the older women go out to work, younger women in the household may have to carry an additional burden of domestic chores, potentially affecting their schooling time. But Edmonds and Pavcnik (2002) analyzed export liberalization of rice in Vietnam and found it to be associated with declines in child labor and increases in school attendance, particularly for girls of high-school age.

Fontana (2009) surveyed a variety of studies on trade liberalization and women in industry, agriculture, and services. The empirical evidence indicated that trade and trade policies (trade liberalization in particular) had different effects on women and men as well as across different groups of women, depending on several factors and preconditions. Some of these factors included gendered patterns of rights over resources, female labor force participation rates, education levels and gaps by gender, patterns of labor market discrimination and segregation, and in general, the sociocultural environment (see Fontana 2009).

Fontana's (2009) results in the case of agriculture were mixed. In SSA, women do not often benefit directly from increased export production of traditional crops since their property rights in land are limited and smallholder export production is based on unpaid family labor. On the other hand, the situation may be more favorable to women in nontraditional agricultural exports (such as fruits, vegetables, and floriculture), where in some countries, women appear to be participating both as workers and as small-scale producers. Also, Maertens and Swinnen (2012) argued, reinforcing the latter finding, that women benefit more and in a more direct manner from employment in large-scale estate production and agro-industrial processing than from smallholder contract farming. The authors concluded that using the indicator of "participation of small-scale farmers" can be misleading in terms of welfare and poverty effects on women.

In that vein, Fontana (2009) noted that women, whose rights over their own labor are more clearly established in many countries, would benefit more from increases in labor-intensive production than from increases in production based on the use of land and natural resources, areas in which women's rights may be weak. She also noted the differences in women's property rights to land between Africa and Asia, with the former region showing weaker protection.

The gender effects of trade in manufacturing are better documented, but as noted, in the case of agriculture and the informal sector, where many women work, little is known. This fact points to the need for greater efforts to collect gender-disaggregated data on household labor, earnings, and expenditures (see also Quisumbing et al. 2014).

In general, it seems that much depends on the interaction between external factors and country conditions. In this respect, it is crucial to ensure that all discrimination against women in property rights, family law, employment opportunities, access to education and health services, political participation, and general societal status are eliminated. These factors, rather than trade, seem to be the defining factors for women's well-being.

Trade and Dietary Diversity

Dietary diversity has been associated with better nutritional outcomes as assessed by anthropometric measures (such as indicators of stunting, wasting, and similar phenomena) (see Arimond and Ruel 2006; Remans et al. 2014).

Empirical studies have shown that trade has contributed to more availability and, more importantly, to more diversity in the average supply of food available for consumption. For instance, Remans and colleagues (2014) showed, using different measures of diversity,³² that food production in many developing regions is less diversified than food availability (which also includes imports). Table 5.9 shows, for most regions, that production is less diversified than total availability for consumption, particularly using the modified functional attribute diversity indicator, a measure of nutritional diversity (in both indicators, a higher number indicates more dietary variety).

³² The two measures are the Shannon entropy diversity metric (which reflects how many different types of food *items* there are in a certain country) and a modified functional attribute diversity (MFAD) indicator (which reflects the diversity in *nutrients* provided by the different food items based on their nutritional composition).

Table 5.9 Food production and supply diversity

Region	Shannon entropy diversity metric		Modified functional attribute diversity indicator	
	Production	Total availability	Production	Total availability
South Asia	0.71	0.85	0.13	0.71
East Asia and the Pacific	0.76	0.88	0.12	0.71
Africa south of the Sahara	0.80	0.83	0.05	0.71
Middle East and North Africa	0.92	0.86	0.08	0.82
Europe and Central Asia	0.82	0.88	0.08	0.80
Latin America and the Caribbean	0.78	0.92	0.08	0.80

Source: Remans et al. (2014).

Therefore, it could be argued that trade leads, on average, to a potentially better quality of diet through greater diversity.

However, researchers have also noticed a bifurcation of consumption habits in developing countries: poor-quality diets predominate among low-income groups (based on mass consumption of low-quality vegetable oils, fats, and sweeteners) while in parallel a comparatively smaller market for “healthy” food products exists (Hawkes 2008). This “nutrition transition” in developing countries is leading to low-quality diets associated with rising rates of obesity and diet-related chronic diseases, like heart disease, diabetes, and some cancers. Low-quality diets are also associated with undernutrition in the form of micronutrient deficiency, which in turn lowers immunity to infectious diseases.

Trade and trade liberalization, some argue, have played a role in the transition by reducing prices and increasing availability of a variety of unhealthy foods (such as those that are rich in calories, poor in nutrients, and high in saturated fats and salt), when compared with more healthy foods (Hawkes 2008; Kearney 2010). However, those effects may be the result of autonomous demand shifts (linked to urbanization and higher incomes) or to the advertisement and cost/benefit calculations of processors that in turn affect trade, rather than the other way around.

Still, these developments point to the need to consider that trade and trade policies may have different outcomes for people at risk from undernutrition relative to those at risk from overnutrition, for urban compared with rural populations, and for the poor relative to the rich (Hawkes 2008). In particular, Hawkes (2008) highlighted the risk that poor consumers may be more susceptible to adopting unhealthy diets relative to wealthier consumers, who have access to more resources and information. Hawkes (2008) looked at the important increase in production and consumption of vegetable oils and the changes linked to market liberalization in three countries: Brazil, China, and India. She concluded that the policy changes had the effect of integrating these countries into the global soybean oil market and, in so doing, facilitated the increase of soybean oil consumption worldwide, not only as cooking oil but also in processed foods through hydrogenation, a process that by creating trans fats increases the risk of coronary heart disease. She notes that, contrary to those trends and taking advantage of the noted income bifurcation in consumption patterns, companies have been trying to target higher-income consumers with products lower in trans fats.

At minimum, these developments require stronger consumer-oriented policy responses (such as education and nutrition labeling). In general, a proper tackling of those nutritional problems will require a broader cross-sectoral response, including taxes, regulations, and a variety of policy instruments, most of which would be unrelated to trade policies.

Trade and Government Operations

Díaz-Bonilla (2008b), as noted in Section 4, identified three aspects of governance that may be affected by trade (or globalization in general): the responsiveness of governments to the needs of the inhabitants of a country; the availability of public resources; and the policy space (the latter two aspects influence governments' effectiveness). These three aspects will be briefly discussed next.

Responsiveness

As noted earlier, some argue that trade and trade liberalization undermine democracy and thereby the possibility that governments will really respond to the needs of the people. On the other hand, some people have argued that closed countries, where the state holds substantial power over the fate of firms, fortunes, and people, tend to be captured by elites and vested interests, undermining political institutions and the rule of law, and leading to corruption and waste of resources (Krueger 1974; Baghwati 1982; Hirschman 1982). In that sense, international legal frameworks may lead to greater transparency and stability in domestic legal frameworks, protecting citizens from inefficient, unequitable, and unstable changes in regulations by governments captured by sectoral interests.

Furthermore, in line with Lipset (1960) and others who have argued that economic development is associated with the expansion of democracy, it has been argued that free trade leads to greater growth and productivity, which expands the middle class and, with it, the demand for expanded political rights, democracy, and good governance.

The broader debate on whether trade (and more generally globalization), through accelerated growth, is contributing to the creation of a middle class that eventually demands political rights, helping to strengthen democracy, or is generating stagnation and worsening income distribution to the detriment of stable democratic institutions, is complicated by the fact that the evidence on the links between globalization, growth, volatility, poverty, and income distribution is inconclusive and depends on the indicators used to proxy trade expansion (and globalization, in general), the variables of interest, the periods considered, and several other factors (see Díaz-Bonilla 2002, 2008b).

Therefore different studies have skipped the intermediate variables (growth, volatility, and income distribution) and tried to directly analyze the globalization-democracy link, usually finding a positive link between trade and trade openness and democracy, but with caveats about the lack of that positive link, or even its reversal, in the case of commodity exporters³³ (Hamilton 2002; Li and Reuveny 2003; López-Córdova and Meissner 2005; Rigobon and Rodrik 2004; Giavazzi and Tabellini 2005; Eichengreen and Leblang 2006; see a more detailed discussion in Díaz-Bonilla 2008b).

Resources

Some have argued that trade and trade policies (along with other aspects of international economic integration) may also negatively affect government revenues, both directly in the operation of the tax system (for example, if tax competition at the world level reduces the sources of revenues, and if import tariffs are reduced) and indirectly through the influence of the rate and variability of growth on general tax collection. In this view, expanded trade makes countries more vulnerable to international factors and amplifies external competition, which increases the need for government resources to help affected populations, while because of trade liberalization (with the reduction of tariffs) governments are losing resources and are forced to cut welfare expenditures to reduce costs and maintain a competitive economy.

Regarding the impact of trade liberalization on revenues, the empirical evidence does not suggest an erosion of governments' revenues in developing countries (Díaz-Bonilla 2015b): it is true that receipts from trade taxes as a percentage of GDP have declined in many developing countries since the 1990s, but those declines have been more than compensated by expansion in other taxes, particularly the value-added tax (VAT), which has reinforced the revenue-raising capacity in many developing countries. While

³³ Countries with concentrated natural resources (minerals, oil), particularly when in the hands of the state, seem to be correlated with low quality of governance and high levels of social strife (Collier and Hoeffler 1998).

in the 1960s only a small number of developed countries and practically no developing countries were using that tax, by the early years of this century all developed countries plus close to 100 developing countries were using it (Ebrill et al. 2001). Even in the case of SSA, the region where trade taxes contribute most to fiscal accounts, they have remained stable at about 5 percent from the 1990s into the first decade of this century, but they show a decline when compared with the 1980s (Keen and Mansour 2009). Still, comparing 2000–2009 with the 1980s, total taxes as a percentage of GDP increased by several percentage points in SSA. Trends are similar in other developing countries: overall tax revenues in those countries have been relatively stable or slightly increasing (supported by the expansion of the VAT) even though trade taxes have been declining (see Díaz-Bonilla and Robinson 2010).

Policy Space

Even if public revenues have not declined (and therefore governments have the budgetary means to implement policies), the other criticism mentioned before is that international agreements limit the policy space in which governments operate without running into legal challenges within those agreements.

The issue of policy space in agriculture is usually related to the WTO's AoA. Data show that different developing countries (mostly in the middle- and upper-middle-income categories) have been increasing support for their agricultural sectors, taking advantage of the significant policy space available under the AoA.

Indicators of support for agriculture, such as the nominal rate of assistance (NRA) (as calculated by a World Bank project), the producer support estimate (PSE) (computed by the Organisation for Economic Co-operation and Development), and the categories of domestic support that must be reported to the WTO as defined in the AoA, all show increases (Díaz-Bonilla 2014, 2015b).³⁴ In particular, domestic support as measured by the WTO has also increased for several important developing countries, as calculated by Orden, Blandford, and Josling (2011). These authors showed that for the period 1995–2008/2009, the developing countries they considered (Brazil, China, India, and the Philippines) have increased their domestic agricultural support in recent years; India in particular has moved from a level of domestic support of about 6 percent of the total value of agricultural production in the 1990s to greater than 18 percent in 2008/2009 (or more than 11 percent if the domestic food aid program and related public stockholding are not counted). China moved from 6.5 percent to 9.6 percent in the same period. Domestic support in Brazil and the Philippines, on the other hand, stayed relatively flat at somewhat less than 6 percent and 4 percent of the value of agricultural production, respectively. Still, domestic support in these developing countries as a percentage of agricultural production remains clearly below the levels seen in developed countries.

Therefore, in legal terms, developing countries do not seem particularly constrained in the implementation of a range of possible investment and financial policies in support of agriculture. But the other side of the coin is that most industrial countries are not that constrained either and, different from many developing nations, they have the financial, human, and institutional resources to implement highly distorting policies.

Although a better fiscal position in developing countries seems to have led to increases in public expenditures in and for agriculture (Díaz-Bonilla 2015b), the main question is not about general policy space but whether the composition of those expenditures is adequate for the goals pursued. Although there seem to have been some improvements in the balance of “public goods” (which increase overall productivity) versus “private goods” (which are transfers to some individuals), there is still plenty of room

³⁴ The PSEs and NRAs are economic measures of support to agricultural producers. Both the NRA and the PSE include support through trade measures (which usually imply a transfer from consumers to producers), plus different measures of support that imply fiscal expenditures (that is, they represent transfers from taxpayers to producers). A third indicator of domestic support for agriculture is defined in the AoA of the WTO but is significantly different from the other two. Increases (decreases) in their values in a country broadly indicate expanded (reduced) support to agricultural producers. For the calculation of the NRA, see Anderson and Nelgen (2013) and the database at <http://econ.worldbank.org/external/default/main?pagePK=64214825&piPK=64214943&theSitePK=469382&contentMDK=21960058>. Comparisons of PSE and different WTO measures of domestic support can be found in Effland (2011); see also Brink (2009).

to improve the allocation of fiscal resources toward public expenditures that have the best payoff for agricultural productivity, poverty reduction, food security, and environmental sustainability. These investments are usually those oriented toward agricultural R&D, rural infrastructure, and health and education (Mogues et al. 2012). Other expenditures, such as subsidies for fertilizers, water, and credit, may still play a role, depending on the level of the country's development, either by helping to jump-start some activities in the short term or by contributing to the correction of market failures. But the validity of the assumptions on which those programs are based needs to be assessed periodically: these expenditures use fiscal resources that may have a better alternative use for growth and equity in agriculture and for the whole economy.

More generally, there are economywide effects of those programs, whether they are funded within the budget through mechanisms that create second-round effects (such as inflationary money financing of deficits or increased indebtedness) or are financed off-budget by shifting the implicit costs from general taxpayers to some specific economic agents. In addition, subsidies may be unequally distributed, benefiting the well-off more than family and small farms, and the poor and vulnerable.

On the other hand, public expenditures and investments that focus on important development outcomes—poverty reduction; social equity; environmental sustainability; enhanced land and water property rights for rural communities; and the proper operation of labor, credit, input, and output markets—have important beneficial impacts on both the agricultural sector and the general economy, and should receive particular attention (Mogues et al. 2012).

Some Conclusions

While some of the potential interventions by governments to improve food and nutrition security may be influenced by trade and trade policies, there are others that are not related to the latter. Also, for most of the public interventions that can really help with food and nutrition security,³⁵ governments seem to still retain a large margin of policy autonomy, and many developing countries have been increasing the availability of resources that can be dedicated to the needed policies and investments.

³⁵ These interventions may include, among others, (1) ensuring adequate productive services and infrastructure for small-scale farmers (including women) so they can take advantage of productive opportunities; (2) monitoring and curbing episodes of displacement of small-scale farmers from their access to land and water, while trying to secure land and water rights to rural workers, landless producers, and other poor and vulnerable rural populations willing to work the land; (3) ensuring a proper operation of labor markets, with adequate wages and working conditions; (4) ensuring a proper operation of financial markets; (5) safeguarding competition within the whole value chain, monitoring dominant actors and the possible presence of monopolies/oligopolies or monopsonies/oligopsonies; (6) implementing several nutrition programs, starting with multidimensional interventions related to children, pregnant women, and other vulnerable groups; (7) making sure that legislation, regulations, or other practices do not hamper women's status and their access to land and other productive assets, and rather, that they provide for equal opportunities related to employment and wages, and access to education; and (8) implementing campaigns of consumer education, product labeling, and so on, to ensure dietary awareness.

6. OTHER METHODOLOGICAL AND VALUE ISSUES RELATED TO THE ANALYSIS OF TRADE AND FOOD AND NUTRITION SECURITY

For all the data and methodological problems, the contextual and structural divergences, complex linkages and policy combinations, and varied empirical evidence (discussed in Sections 2–5) there may be even deeper differences in how reality is judged and interpreted that separate the groups with opposing views on trade and food and nutrition security. Three crucial topics in this regard are (1) the policy objectives and their measurement; (2) how to evaluate impacts and outcomes, and (3) the existence of prior views about the operation of the world and national economies.

Regarding the first topics, economic analysis tends to focus on efficiency and welfare, the latter measured usually as an equivalent variation (EV)³⁶ in consumption or similar indicator, as well as by other variables such as production, employment, wages, trade balances, and the like. Noneconomic policymakers and civil society may add other policy objectives, such as health, environment, participation, gender equality, human dignity, and the like.

How we define policy objectives or desirable outcomes more generally is a matter of values that influence the judgment about whether trade is or is not helping to reduce food and nutrition insecurity. Policy analysis and communication efforts must also consider those more general values being debated and the discrepancies that may arise due to the existence of different value frameworks.

Religious traditions and ethical approaches emphasize the importance of considering the needs of the poorest of the poor. For instance, Swaminathan (2008) referred to some of Gandhi's simple ground rules to help the poor, in particular two of them: *antayodaya* (which Swaminathan translates as “start with the poorest of the poor”) and *sarvodaya* (interpreted as “a high social synergy society—a society in which there are no winners and losers”) (2008, 94). Different religions have explicit references to the preference for the poor and vulnerable as well. For instance, in the Christian tradition, the Gospels set the standard for moral behavior as giving food to the hungry, water to the thirsty, clothes to the naked, and so on. In economic terms, Rawls's “maximin” principle of justice accords with the prescription of trying to improve the situation of the worst-off people first (Rawls 1971).

Besides the question about whether the debate is focusing on the same values (which would help to frame the issues/problems to be addressed and to better define the policy objectives to be pursued), there is the issue of measuring and evaluating impacts and outcomes of the policy change (the second topic mentioned at the beginning of this section).

For many critics of trade (and globalization in general), just presenting the story of someone poor made worse off by the policy change analyzed is enough to rest their case against that policy. Economic analysis, on the other hand, tends to consider average and total increases in welfare as adequate indicators of good outcomes. The Pareto optimality principle (that reforms leave no one worse off than before while at least one person is better off) is accepted by economists as a guide for welfare decisions in general, but—different from the approaches that prioritize those in worse-off conditions—it is not restricted to the poor. Furthermore, the cross-compensations that a larger overall welfare level may allow to make sure that no one is worse off are not necessarily implemented in practice.

Moreover, a general Pareto criterion of the type utilized by economists would not be considered favorably under the previous criteria, because an increase in general welfare that leaves the poor as they were before would not be deemed just. And of course it would be unacceptable if some poor people were affected negatively.

Even for Pareto-optimal policy reforms, this optimality is likely to be achieved only in the medium term when all transitional adjustments have played out, while in the immediate aftermath of policy changes, the more realistic scenario is one in which there are winners as well as losers. For example, import-substituting sectors and industries that were previously enjoying the benefits of

³⁶ The EV is the difference in economic value between the consumption basket that takes place with the policy change and the consumption basket without the policy change, with both consumption bundles valued at the prices prevailing before the policy change.

protection would lose, just as consumers that now can buy cheaper imported goods gain. In cases where the previously protected sector happens to be an unskilled labor-intensive sector, poverty may increase in the short term (even though protection in that sector may have been hurting the poor in other sectors). Of course, in due time laborers in the contracting sector can seek and find employment in expanding sectors. However, this kind of adjustment is not always easy for the poor, especially if some kind of retraining or geographic relocation is required (see Díaz-Bonilla 2015a and Fernandez de Cordoba et al. 2006).

So, there are discrepancies on how to evaluate impacts/effects, from requiring that not a single poor or food-insecure person be made worse off, to other criteria, including those that would focus on an overall reduction of the number of poor or food insecure even when there is some “churning” (that is, more people becoming food secure while a smaller number may be dropping into food insecurity).³⁷

Beyond the methodological and value issues mentioned before, there may be deeper differences based on specific views about how the world works and should work (the third of the topics introduced at the beginning of this section). As noted in Díaz-Bonilla (1982), critics of trade (and globalization in general) tend to consider participation in the international economy as the root of all problems and seem to perceive the world as controlled by corrupt governments and greedy corporations. In this view, the world economic system basically entails a long chain of exploitation that starts from the very poor and benefits the very rich—an interpretation linked to Marx’s “law of increasing misery” of the proletariat as counterpart to the “law of increasing concentration” (leading to exploitation across classes), as well as to the historical experience of domination under colonial rule (resulting in exploitation across countries). In this view, poverty and food insecurity are necessary outcomes of the operation of the global economic system. The expansion of trade would then be a proxy for the expansion of the current economic and political system the critics consider deeply flawed. The policy implications are to cut off, or sharply limit, links with the rest of the world, as well as to undertake a wholesale restructuring of the economic and social relations within the country.

Alternatively, other visions consider poverty and food insecurity not necessary components for the operation of the world economy; rather, in these views, these scourges can be eliminated, improving the functioning of the current global economic system. For instance, some would argue that the increasing gap between the rich and the poor is related in good measure (at least in present times, leaving aside the debate over the possible importance of colonial transfers in the past) to endogenous technological change in more advanced countries linked to higher human capital and a better institutional framework for entrepreneurship.³⁸ In an endogenous growth scenario, poverty in the developing countries may be indifferent to the world economic system, rather than necessary for its operation: considering the enormous imbalance in wealth, the poor do not seem to have an economic base that can sustain the transfers to the rich that would be “necessary” for the operation of the world economy in line with the first view. While this reality opens the possibility of further marginalization of the poor, it also allows humanitarian reasons to be invoked to address poverty problems.

In addition to the compelling humanitarian reasons (which should suffice), the case in favor of eliminating poverty and hunger is further strengthened if it is dysfunctional to the world system, as a third view would contend. In this perspective, poverty and hunger in developing countries continues to generate a sequence of health, environmental, military, and humanitarian crises, which end up affecting rich countries through multiple channels, with potentially critical implications for the economic and physical security of developed nations and regions. Alleviating poverty and hunger, in this perspective, would at least eliminate the negative feedback effects on more advanced countries. On a more positive note, helping poor developing countries will add to the economic vitality and political stability of the whole world.

³⁷ Obviously, this churning would violate the Pareto optimum.

³⁸ Marx himself recognized the importance of technology in development, and struggled to accommodate the implications of technological change with some of his “absolute laws” for wages, which projected a constant deterioration in workers’ conditions.

For the second and third views, poverty and hunger alleviation and eventual elimination not only are possible within the process of expansion of trade and globalization in general, but would in fact be helped by such a process (for instance if the poor are assisted and supported so they can participate in the technological developments that are making industrialized countries richer).

In summary, the background for many of the debates is the existence of different visions of the operation of the world economy, the role of poverty in it, and the conditioning factors for food and nutrition (in)security. If someone believes that poverty is “functional” or “necessary” for the operation of the international system, that person cannot accept (whatever the evidence) that the expansion of trade and other forms of globalization could help the poor, and would rather consider that it would accentuate the problem. For those holding that view, very little can be done except “change the system.”

7. CONCLUSION

This paper has speculated about the reasons for the fractured and antagonistic debate about trade and food security, hoping that a better understanding of those reasons may lead to more convergent views about adequate policies and approaches. We argued that part of the misunderstandings emerge from (1) the different meanings of *trade* (Section 2), (2) the fact that food and nutrition security are multidimensional conditions with a large number of potential indicators for both concepts (Section 3), and (3) the variety of channels that may link food and nutrition security to trade issues (Section 4).

All three aspects complicate the empirical assessment of the interaction between trade and food and nutrition security as discussed in Section 5. Besides the multidimensional nature of trade and food and nutrition security, and the variety of channels of interaction, empirical assessments have to contend with the fact that the same trade policy may have different impacts depending on a series of contextual and structural characteristics of the national economy and the global economy in which it is immersed, and on the rest of the policy package that a trade policy measure is part of.

Yet comprehensive empirical studies (such as Thomas 2006 and McCorrison et al. 2013) clearly show more cases of positive food security outcomes emerging from trade liberalization events than negative ones. Also trade, in most countries, has helped with food security by stabilizing domestic consumption versus more erratic domestic production (while self-sufficiency tends to lead to more instability in domestic prices and availability). Further, the larger availability through imports appears to have complemented rather than displaced local production. Finally, although the nominal value of food import bills has increased in most developing countries, increases in world trade have helped to reduce the economic burden of those imports measured as a percentage of total exports, while the ratio of food imports has remained stable as a percentage of GDP for the aggregate of low-income countries.

It also seems that more open economies tend to grow faster, and countries with successful growth stories have been those that, among other things, fully exploited the trade opportunities offered by the world economy. Also, in broad economic terms, and contrary to common perceptions, closed economies have been prone to suffer from more economic instability for the variety of general-equilibrium reasons discussed in Section 5.

This last section also reviewed other potential channels through which trade may affect food security, such as changes in land tenure, concentration in product and input markets, gender impacts, and consumption of junk food. Empirical evidence suggests that, when there have been potential negative effects on those dimensions, they were related to factors other than trade expansion per se, such as precarious land tenancy by the poor and vulnerable; inappropriate competition policies by governments (which sometimes create or reinforce monopolies and reduce competition in general); legal, administrative, or social discrimination against women; and the lack of an integrated approach to malnutrition (which allows the expansion of food high in sugars, salt, and unhealthy fats). Those issues must be addressed directly; cutting off trade would not solve those problems and may aggravate them.

However, the current period of higher nominal prices has also led to more interest in food self-sufficiency. An instinctive reaction of many policymakers and civil society observers in debates about the links between trade and agriculture is to advocate protectionist measures. Sometimes investments in human capital, infrastructure, and technology (all allowed without restrictions in the AoA) are dismissed with the argument that they cost money and are difficult to administer, with the implication that protection does not cost money and is easier to implement (see the discussion and references in Díaz-Bonilla, Thomas, and Robinson 2003). But in fact, protectionism does cost money. It is important to realize that protectionism for food products operates as a privately collected and regressive tax on food; this implicit tax is paid relatively more by poor consumers (given the incidence of food in their expenditures), and the benefits accrue relatively more to large producers (considering that protection is a markup received per unit produced). High tariffs and related import restrictions also increase the price of agricultural inputs to other sectors (primary and agro-industrial), affecting production and employment in the latter. Protection for food products means higher costs of wage goods and may lead to higher salaries,

affecting the international competitiveness of other labor-intensive export industries. Large trade protection also tends to overvalue the real exchange rate, with negative implications for production and employment in other tradable sectors. Finally, increased trade, rather than protectionism, seems to have greater positive effects on technological advancement, investments, and productivity.

On the other hand, a policy of complete free trade in agriculture and food production may not necessarily increase national welfare if it leads to increases in unemployment or disuse of factors of production that are not easily transferred to other activities, particularly if the newly unemployed are the poor and vulnerable and if there are no other policy instruments available to facilitate the (probably long) transition to other employment opportunities or to support incomes during that process. This possibility highlights the need for carefully modulated policies for poor producers and consumers. The aggregate production, consumption, and employment effects need to be analyzed in a general economic setting that considers how labor and other relevant markets really operate in a given country context.

It is remarkable that the defenders of many protectionist measures present them as job creators in the activities protected, without considering their general equilibrium effects and, in particular, what happens with aggregate employment, which may well decline due to the trade intervention suggested. On the other hand, many standard analyses of free trade assume that there is always full employment, without considering the significant increases in unemployment that ill-conceived liberalization experiments can generate well beyond the short term, affecting aggregate demand in the economy and leading to the deterioration of human capital (as well as the social, family, and individual problems related to lack of employment).

In this regard, and not only with respect to trade policies, it is important to focus on workers and producers, providing employment opportunities and helping these people during unemployment and serious shocks, while at the same time allowing stagnant and unviable industries, companies, and jobs to be restructured or to disappear (Commission on Growth and Development 2010).

A particular topic in the trade and food security debate is whether governments may be constrained by international agreements, such as the WTO framework, in their policy space to support agricultural and food production. Clearly, developing countries would be well advised to invest more in expanding and stabilizing their domestic agricultural production. As noted, the instinctive reaction of some policymakers and civil society advocates (both in the previous context of low world food prices and the new context of higher prices) has been to resort to protectionist measures. However, green box measures linked to investments in public goods are the true basis for competitiveness and productivity. In that regard, the AoA does not constrain good policies used by developing countries to address poverty and food security, such as a variety of programs aimed at poor producers or consumers. However, it does not significantly constrain policies with negative efficiency and equity effects either, in both industrialized or developing countries. Also, there are certainly imbalances in the AoA, because industrialized countries have been able to secure exemptions for some of their policies and have been allowed to continue using significant amounts of money to distort domestic and export subsidies. Now, some large developing countries have been using their own policy space to increase their own protection of, and support to, agriculture. Under some proposals by WTO members, these asymmetries may continue even if the Doha Round is completed.

Overall, in lower-income developing countries, the most important constraints to designing and implementing adequate trade and nontrade policies to help with food security continue to be the countries' limitations in financial, human resources, and institutional capabilities. A particularly relevant problem for achieving food and nutrition security in several developing countries is domestic violence and war.

It must also be remembered that general trade policies are not necessarily the main factor affecting food security and that, in any case, trade policies are just an instrument, and a blunt one at that, with a variety of potential aggregate and distributive impacts that need to be considered when addressing the challenges of poverty and hunger. Trade policies can make a positive contribution to poverty alleviation and food security within a properly defined global program of macroeconomic, investment, institutional, and social policies in which differentiated approaches and instruments are targeted to the

households and individuals that suffer from poverty and food insecurity, noting that poverty and hunger materialize at the household and individual levels. Therefore, protection and related trade policies aimed at specific food products—even if labeled as “special,” “food-security staple,” or any other name suggesting the need for particular consideration—do not necessarily represent the most effective, efficient, and even equitable way of addressing the poverty and food-security challenges of affected households. Instead, poor countries need adequate policies that operate at the household and individual levels. Investments and safety nets should be targeted to the poor and vulnerable, as both consumers and producers, rather than to resort to policies that protect and subsidize crops in general, which in addition usually benefit larger-scale farmers.

In general, it is necessary to take a multidimensional approach and develop an integrated framework for food security and poverty alleviation. Because of the multiplicity of policy objectives and instruments, there may be a wide variety of complementarities across them; but inconsistencies, incompatibilities, and unwanted side effects may emerge as well. Policymakers sometimes tend to present policies to the public by listing a variety of objectives, as if they were all achievable at the same time. But it is usually very difficult to avoid some inconsistencies and trade-offs among them. It is very important to be aware of this fact and to clearly identify those potential conflicts.

In terms of aligning objectives and instruments, it helps to remember two general policy notions (see Díaz-Bonilla 2015b for a more detailed discussion): one is the Tinbergen rule, which says that it is usually necessary to have at least as many instruments as objectives; the other is the Bhagwati principle (from Bhagwati, 1971), which argues for the need to tailor policy interventions as closely as possible to the source of the problem in order to minimize unwanted side effects. An example of this principle, mentioned before, is that if a government wants to help the poor and vulnerable, it should use policy instruments (such as cash transfers) focusing directly on them. Targeting specific food products (even if called food security crops) may not be the most efficient and equitable way to reach the intended objectives of poverty reduction and food security. Furthermore, the previously noted triple burden of malnutrition also has implications in this regard when one considers policies for food security that center on a limited number of products selected mainly because of their calorie content: this approach will have to contend with the fact that a lack of dietary diversity appears more correlated than calorie consumption with the prevalence of child stunting and wasting, and with underweight mothers (Arimond and Ruel 2006). If lack of dietary diversity is a more relevant indicator of nutritional problems, then food security programs focusing on a limited number of staple crops would not address the main problem.

In summary, the best policy approach for developing countries is to follow a relatively neutral trade policy across products with a level of import tariffs that balances the needs of consumers, particularly the poor, for affordable food, with some price margin preference to try to avoid the disadvantages in size, natural resource endowments, and similar factors affecting small producers in developing countries that may leave them without alternative employment (assuming that, within the short to medium term, they may be relatively immobile across activities and that there are no policy alternatives better targeted to help with the eventual transition).

Also, other complementary policies for poverty alleviation and food security will be needed, such as support for land and water ownership by small producers and landless workers; investments in human capital, infrastructure, climate change adaptation and mitigation, and agricultural R&D; appropriate management of natural resources; strengthened safety nets for the poor and vulnerable (conditional cash transfers, school lunches, women’s and infants’ nutrition programs, food-for-work programs); women’s empowerment programs; community organization and participation, particularly for the poor and vulnerable; adequate functioning of product and factor markets, curbing abuses of dominant market positions; macroeconomic stability; elimination of institutional, political, and social biases that discriminate against vulnerable groups; and overall good governance, including strong efforts to reduce corruption and ensure public safety and peace.

Considering the variety of potential effects from the same trade policy depending on the context, the best advice to policymakers, rather than “it depends,” should be “know your country and its circumstances.” Also, it is necessary to recognize that there are differences in values and ideological lenses. Economic analysis must consider more differentiated impacts on the poor and vulnerable, including gender issues, rather than using only aggregate welfare measures evaluated by the Pareto principle. But on the other hand, if some people oppose trade simply as a proxy for the expansion of an economic system they dislike, then the policy differences will never be bridged, and the fracture between those who think that “trade causes hunger” and those with more positive views of the role of trade in achieving food security will continue.

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