ADBI Working Paper Series

TRADE, POVERTY ERADICATION, AND THE SUSTAINABLE DEVELOPMENT GOALS

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No. 629
December 2016

Asian Development Bank Institute

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Suggested citation:

Brambilla, I., and G. Porto. 2016. Trade, Poverty Eradication, and the Sustainable Development Goals. ADBI Working Paper 629. Tokyo: Asian Development Bank Institute. Available: https://www.adb.org/publications/trade-poverty-eradication-and-sustainable-development-goals

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Abstract

This paper investigates if trade can help achieve the United Nations Sustainable Development Goal of poverty eradication using microeconomic and macroeconomic mechanisms and the effects of trade and trade policy on consumer prices, producer prices, and wages. As these mechanisms affect the real income of households, they determine the likelihood that a household may be lifted out of or pushed into poverty. The impacts of trade on growth and longer-term consequences of trade liberalization were also analyzed using data from African countries. While there is sound evidence that trade can be pro-poor, there is significant heterogeneity in the poverty impacts of trade, both across households and countries. This highlights the importance of complementary policies such as infrastructure, trade facilitation, and social protection.

JEL Classification: F14, F16, O24

Contents

1. INTRODUCTION

This paper investigates whether trade can help achieve the Sustainable Development Goals set by the United Nations, particularly the ambitious poverty eradication goal. The first of 17 goals, it proposes to "end poverty in all its forms everywhere." Other associated targets include

(i) by 2030, eradicate extreme poverty for all people everywhere, currently measured as people living on less than $1.25 a day;

(ii) by 2030, reduce at least by half the proportion of men, women, and children of all ages living in poverty in all its dimensions according to national definitions;

(iii) implement nationally appropriate social protection systems and measures for all, including floors, and by 2030, achieve substantial coverage of the poor and the vulnerable;

(iv) by 2030, ensure that all men and women, in particular the poor and the vulnerable, have equal rights to economic resources, as well as access to basic services; ownership and control over land and other forms of property; inheritance; natural resources; appropriate new technology; and financial services, including microfinance;

(v) by 2030, build the resilience of the poor and those in vulnerable situations, and reduce their exposure and vulnerability to climate-related extreme events and other economic, social, and environmental shocks and disasters;

(vi) ensure significant mobilization of resources from a variety of sources, including through enhanced development cooperation, to provide adequate and predictable means for developing countries, in particular least-developed countries, to implement programs and policies to end poverty in all its dimensions; and

(vii) create sound policy frameworks at the national, regional, and international levels, based on pro-poor and gender-sensitive development strategies, to support accelerated investment in poverty eradication actions.

Trade[1] can affect poverty through several channels, notably through macroeconomic and microeconomic mechanisms.[2] In the macroeconomic sense, trade affects economic growth, which, in turn, can benefit the poor. Microeconomically, poverty is defined at the household and individual level. Consequently, trade affects poverty through impacts on household behavior. Trade liberalization changes prices, and households and individuals often base their economic decisions on prices. Consumption decisions depend on prices as well, and households are affected as consumers. Higher prices lower real expenditures, while lower prices increase them. Consumers will consume less of more expensive goods, and more of the less expensive ones. Supply and production decisions also depend on prices, and households will be affected as income earners. The production of food, for own consumption or for sale; production of cash crops; supply of labor; and wages paid in labor markets are examples of how household incomes can change with trade liberalization.

[1] For this paper, trade is defined as anything that affects exports and imports. This can include own tariffs, world interventions (e.g., foreign tariffs, quotas, or standards), regional or multilateral trade agreements (e.g., Doha and Mercosur), or even foreign subsidies (especially in agriculture).

[2] Winters, McCulloch, and McKay (2004) provided an overview of these channels.

As expected, it is difficult to summarize how trade affects poverty. There are multiple channels, and these channels may operate in different directions. Higher prices are good for producers, but are bad for consumers. In addition, households are heterogeneous. A study on the effects of trade liberalization on poverty must consider differences in employment, consumption, and production among the poor. Moreover, trade liberalization may affect members of the same household differently, and the nature of trade liberalization may differ across countries. Some countries may be relatively open, while others will have much higher protection. The level of trade protection, in turn, may differ across sectors. Some countries may have higher tariffs on agriculture, others on manufacturing or services. Finally, trade liberalization operates and interacts with the general economic environment, institutions, and other policies in different manners, further complicating results.

2. TRADE AND POVERTY: MICROECONOMIC MECHANISMS

This section uses a theoretical framework to explain how trade policy can affect poverty and to illustrate the main microeconomic mechanisms. In this analysis, poverty is a microeconomic issue that operates at the level of households, workers, and people. Notice that trade affects the prices for producers and consumers. The trade–poverty link can thus be examined by tracing how trade affects prices and, in turn, how prices affect poverty.

2.1 Net Consumers and Net Producers

The framework builds on standard agricultural household models (Barun and Squire 1979; Singh, Squire, Strauss 1986). The unit of analysis is the household, denoted by h, and its members. To measure welfare changes, the indirect utility function approach is adopted (Deaton 1997). Welfare changes are mostly associated with changes in household real income.

The indirect utility function of household h depends on a vector of prices $\boldsymbol{p}$ and on household income y^h:

$$V^h(\boldsymbol{p}, y^h) = V^h(\boldsymbol{p}, x_0^h + \textstyle\sum_j \pi_j^h(p_j)), \quad (1)$$

where the vector $\boldsymbol{p}$ comprises consumer prices for all goods. In this equation, household income comprises profits from the production of goods j, $\pi_j^h(p_j)$, and exogenous income, x_0^h. Labor income, transfers, and other sources of income (i.e., capital income) are left out for the moment.

Consider the impacts of changes in the price of commodity j. The short-term impacts on a household can be derived by differentiating the indirect utility function:

$$\frac{\partial V^h}{\partial ln\, p_i} = \frac{\partial V^h}{\partial ln\, y^h}(\phi_i^h - s_i^h), \quad (2)$$

The left side is the object being measured. On the right side, $\partial V^h / \partial ln\, y^h$is the marginal utility of money to individual h, ϕ_i^h is the share of household income derived the production of good i, and s_i^h is the budget share spent in good i. In Deaton (1989b) and (1997), the quantity

$$b_i^h = (\phi_i^h - s_i^h), \tag{3}$$

is the net benefit ratio. In fact, $\phi_i^h - s_i^h$ is the money equivalent of the losses or gains for different individuals. Note that $\partial V^h / \partial ln\, y^h$ is the private marginal utility of income, but the social marginal utility of money is the most important. This summarizes the attitudes of a policy maker toward providing resources to individual h.

Note that the household is affected both on the consumption and income sides. On the consumption side, consumers are worse off if prices go up but are better off if prices go down. In a first-order approximation, these impacts can be measured with budget shares, s_i^h. On the income side, there is also a direct impact on profits if the household produces goods i, which depends on the share of income attributed to these goods, ϕ_i^h. In rural economies, this source of income can account for a large fraction of total income. In more urbanized economies with more developed labor markets (e.g., many places in Latin America), the role of direct production of agricultural goods will be much less important.

Overall, the right side of this equation establishes a key result: the net-producer/net-consumer result. After a price increase, net consumers (as defined by the difference between budget shares and income shares) are worse off, and net producers are better off. The opposite is true for price declines (i.e., net consumers become better off, and net producers become worse off). Further, it shows that the welfare impacts will be heterogeneous across countries. An exporter of agricultural goods will, on average, benefit from price increases associated with the international liberalization of agriculture, but an importer will probably be hurt by those changes.

This result was originally introduced by Deaton (1989b), who advocated the use of nonparametric density estimation and nonparametric regressions in economic development to study the distributional effects of price changes. Deaton used data from the Thailand Socio-Economic Survey of 1981–82 to explore the distributional consequences of the export tax on rice across all households. He found that an increase in the price of rice, resulting from the elimination of an export tax, would benefit the average household across the entire income distribution. The average poor person, as well as the average rich person, would benefit little. The benefits for the poor were small, because they tend to both consume and produce lots of rice, selling little. The benefits to the rich were also small, because while sellers are often large, there are only a few of them. The gains would be much higher in the middle of income distribution, indicating that the middle class would gain the most from higher rice prices.[3]

The ideas introduced in Deaton's work have been, and still are, extensively utilized in the literature. Examples include Deaton (1989a), for Cote d'Ivoire, Indonesia, and Morocco; Budd (1993), who investigated food prices and rural welfare in Cote d'Ivoire; Benjamin and Deaton (1993), who studied cocoa and coffee in Cote d'Ivoire; Barrett and Dorosh (1996), who looked at rice prices in Madagascar; and Sahn and Sarris (1991), who examined structural adjustments in several Sub-Saharan African

[3] This analysis does not take into account the fiscal implications of eliminating the tax.

countries. Deaton (1997) also provided an account of the early use of these techniques in distributional analysis of pricing policies.

2.2 Wage Income and Prices of Nontraded Goods

While the net-consumer/net-producer result is intuitive, it rests, in part, on the omission of labor market effects and impacts on the prices of nontraded goods. In a small, open economy that faces exogenous commodity prices (determined in international markets), wages will respond to changes in those prices mainly because the demand for labor depends on prices.[4]

Changes in relative product prices cause some sectors to expand and others to contract. If sectors use factors of production in different proportions, then the relative demand for factors (including skilled labor, unskilled labor, and capital) will change. Even with a fixed labor supply, wages will adjust. If the labor supply reacts as well, an additional channel emerges. In practice, the link between wages and prices depends on the way that product prices affect factor demands and supplies, and changes in factor demands and supplies transmit to wages.[5]

The prices of nontraded goods can also be affected. In the simplest mechanisms, a change in the price of a traded good affects factor prices. This, in turn, affects the cost of production of nontraded goods. As a result, the prices of these goods may change as well. How these prices, including wages, respond to trade policy is an empirical question.

It is simple to amend the theoretical framework to account for these responses. The indirect utility function now is

$$V^h(\boldsymbol{p}, y^h) = V^h(\boldsymbol{p}, x_0^h + \textstyle\sum_j \pi_j^h(p_j) + \sum_m w_m^h), \quad (3)$$

where $\sum_m w_m^h$ is the wage income of household h, which is the sum of the wages of all working members m (w_m^h).

The first-order impact of changes in the price of good i can be derived by differentiating equation 3. The net benefit ratio becomes

$$b_i^h = (b_i^h - s_i^h) d \ln p_i + \textstyle\sum_m \theta_m^h \varepsilon w_{i,m}^h d \ln p_i, \quad (4)$$

where θ_m^h is the share of the wage income of member m in total household income, and $\varepsilon w_{i,m}^h$ is the elasticity of the wage earned by household member m with respect to price p_i.

Equation 4 summarizes the first-order impacts of a price change. The first term on the right re-establishes the net-consumer/net-producer result as before. Now, price changes also affect wages. This channel is described by the second term to the right of equation 4.

When there is a price change, labor demand for different types of labor and labor supply can change, thus affecting equilibrium wages. In equation 4, these responses are captured by the elasticities $\varepsilon w_{i,m}^h$, which will vary from one household member to another, provided that different members are endowed with different skills

[4] Labor supply can be affected by prices as well, but this discussion for the moment.

[5] It is possible to imagine situations where wages would not react to a change in a given price, or situations where wages would increase or decrease.

(i.e., unskilled, semi-skilled, or skilled labor) or if they work in different sectors. These impacts on labor income depend on the share of income contributed by the wages of different members, θ_m^h. Clearly, if countries differ in technologies, endowments, or labor regulations, the responses of equilibrium wages to prices can be heterogeneous across different economies.

In the presence of wage adjustments, the standard net-consumer/net-producer proposition needs to be modified. Consider an extreme case where a farm-household consumes a product but does not produce it. Instead, the farm earns income from selling labor to neighboring farms. Omitting wages, this household is a net consumer and could thus be hurt by a price increase. However, if wages respond positively to prices, the final welfare effect may not entail a loss.

This type of wage response was studied in Ravallion (1990), who explored the conditions under which net consumers of food products in Bangladesh lose or gain in the face of increased food prices when rural wages adjust. Ravallion estimated low elasticities of agricultural wages to food prices and concluded that responses are unlikely to be strong enough to offset the short-term adverse distributional effects of higher food prices. The long-term estimates appeared to be more favorable to the poor, but it would take around 4 years for any gains to materialize.

Boyce and Ravallion (1991) looked at this issue using newer data for Bangladesh. They set up a dynamic econometric model of agricultural wages and rice prices, finding that increases in rice prices relative to the prices of manufactured goods have adverse effects on the real wages in terms of rice in both the short and long term.

Porto (2005) and Porto (2006) used two models where the first-order approximation was extended to allow for wage adjustments. Porto derived additional terms in the expression for the compensating variation. A major component of b was the direct impact on wages (as in equation 4 here). Also, a given farm could either sell or purchase labor in the farm-labor market; thus, the estimation of b had to include additional impacts that arose due to changed wage earnings or to changed paid wages. Porto (2005) found that increases in the prices of agro-manufactured exports such as wine (a major export sector in Moldova) have sizeable poverty-reducing impacts. Moreover, wages respond positively to export prices, causing first-order gains that dominate both the consumption losses due to higher consumer prices and profit losses due to higher wages paid to hired labor. Porto (2006) explored the distributional consequences of Mercosur in Argentina and found welfare gains for average poor and middle-income households (and negligible effects for the wealthiest households), because, on top of gains from price reductions due to tariff cuts, changes in wages occurred that favor unskilled workers over skilled workers, and unskilled workers are concentrated at the bottom of the income distribution.

Ferreira et al. (2011) and Jacoby (2013) studied similar issues, but instead of looking at trade policy, they investigated impacts of commodity prices. Ferreira et al. (2011) looked at Brazil and found large, negative consumption effects but positive, progressive income effects, particularly in rural areas. Thus, overall, the Brazilian middle-income household has suffered larger proportional losses than the very poor or rich households. Jacoby (2013) reached a similar conclusion in his study of food prices in India. Specifically, once the wage gains are accounted for, he found that rural households across the income spectrum actually benefit from higher agricultural commodity prices.

It is noteworthy that, in all of these papers, the adjustment of wages is a fundamental channel through which trade operates. An important element of this work is the estimation of the responses of wages to prices, wage-price elasticities. Ravallion

(1990) used an aggregate time series of agricultural wages and rice prices to estimate them. Porto (2005, 2006) combined time series of prices with time series of household surveys for identification. In his study of the North American Free Trade Agreement (NAFTA) and Mexico, Nicita (2009) adopted Porto's approach and combined a time series of regional prices and household surveys to link wages to agricultural and manufacturing export prices. Nicita, Olarrega, and Porto (2014) proposed a different way to estimate these elasticities using the duality theory and trade and endowment data to infer wage-price elasticities from Rybczynski elasticities. Another way to estimate wage-price elasticities—using simulation methods—can be found in Artuc, Lederman, and Porto (2015) and Artuc, Porto, and Rijkers (2016).

Regarding the responses of nontraded goods (i.e., spillovers), spillovers are defined as the impacts of a change in market i on the activity in market j. There are two types of spillovers: (i) production linkages occur when the expansion of a sector affects upstream activities (i.e., backward linkages) or downstream activities (i.e., forward linkages), and (ii) expenditure linkages occur when the increase in income due to the expansion of a sector raises the demand for outputs and thus the derived demand for inputs in other sectors. Porto (2015) also described a variant of the spillover mechanism in which markets may be segmented so that wages can differ across sectors. However, sectors are related via forward and backward linkages, so that an expansion of one sector may have implications on other sectors.

Here, a different type of spillover exists that arises when other product markets, rather than labor markets, are affected. These spillovers are likely to take place in nontraded goods. As shown previously, changes in commodity prices affect factor prices, including wages. If the wages earned in nontraded sectors are affected, then the cost of producing these goods will change. This, in turn, will affect the equilibrium prices of these goods. As a result, there are additional welfare impacts on the consumption side. Notice that these are first-order impacts. To derive the impacts, the indirect utility function is

$$V^h\left(\boldsymbol{p^T}, \boldsymbol{p^{NT}}, y^h\right) = V^h\left(\boldsymbol{p}, x_0^h + \sum_j \pi_j^h\left(p_j\right) + \sum_m w_m^h\right), \tag{5}$$

which is now a function of both traded good prices $\boldsymbol{p^T}$ and nontraded good prices $\boldsymbol{p^{NT}}$.

The net benefit ratios are

$$b_i^h = \left(b_i^h - s_i^h\right) d\ln p_i + \sum_m \theta_m^h \varepsilon w_{i,m}^h d\ln p_i - \sum_k s_k^h \frac{\partial \ln p_k}{\partial \ln p_i} d\ln p_i, \tag{6}$$

where s_k^h is the budget share spent in nontraded good k.

Porto (2006) provided an example of how to estimate these impacts for Mercosur. He used a series of prices to recover the elasticity of the price of nontraded goods with respect to the prices of traded products. As in equation 2, the first-order impacts are given the product of the induced changes in the prices of nontraded goods and the budget shares spent on those goods. Porto found that the tariff cuts of Mercosur caused the prices of nontraded goods to decline and households to benefit.

Artuc, Porto, and Rijkers (2016) offered an alternative way to compute these elasticities using simulation methods.

2.3 Price Transmission

Price changes must be explored to understand how trade policies and trade shocks transmit to the local economy and how this link depends on market structure, competition policies, infrastructure, transport, and distribution costs.

There are two related issues: (i) the pass-through of international prices to the domestic economy, and (ii) the pass-through to the household. Standard models of international trade and international economics assume competitive markets (and homogenous goods) and frictionless trade. In this scenario, markets are integrated, and the law of one price holds. Domestic prices are equal to international prices converted to the local currency. A slightly more detailed model allows for transport and distribution costs, as well as for trade policy. If p_i is the domestic price of an importable, p_i^* is the international price, e_i is the exchange rate, tr_i are international transaction costs, and τ_i is the tariff rate applied to goods i, then

$$p_i = p_i^* e_i (1 + tr_i)(1 + \tau_i) + \gamma_i \quad (7)$$

where γ_i represents internal transport, resale, marketing, and distribution costs. If goods i is exported, then

$$p_i = p_i^* e_i (1 - tr_i)(1 - r_i) - \gamma_i, \quad (8)$$

where r_i is the export tax on exports.

This framework is now used to explore various issues concerning the responses of domestic prices to changes in international prices, exchange rates, national trade policies, international trade policies, and transaction costs. Clearly, if these equations hold, then a proportional change in the exchange rate e_i, international price p_i^*, or tariff (rather in $(1 + \tau_i)$) is fully transmitted to domestic prices.

The law of one price relies on strong assumptions, and there is evidence against it. In their review, Goldberg and Knetter (1997) concluded that a pass-through rate of around 60% is expected. In another comprehensive analysis of pass-through rates, Campa and Goldberg (2005) found large differences across developed countries. The estimated rate for the United States is 42%, 98% for France, 80% for Germany, and 46% for the United Kingdom.

There are various reasons why the law of one price may fail. One important factor, especially for trade and poverty, is imperfect competition (Feenstra 1989). If markets are not competitive, firms can charge a markup on marginal costs, and these markups may depend on trade policy or trade shocks. Using import unit values for cars, compact trucks, and heavy motorcycles from trade flows between the United States and Japan, Feenstra tested for the symmetry between exchange rate and tariff rate pass-throughs implicit in equation 3. For trucks, he found an exchange rate pass-through of 63% and a tariff rate pass-through of 57%. For motorcycles, he reported an exchange rate pass-through of 89%–100% and tariff rate pass-through of over 100%.

A different instance of imperfect competition and pass-through occurs in export markets in agriculture. In rural areas, and especially in Sub-Saharan Africa, most farmers produce for home consumption. Yet some are engaged in high-value export agriculture, such as coffee, cotton, cocoa, and tobacco. Often, commercialization of export agriculture is produced along a supply chain where intermediaries, exporters, and downstream producers interact with farmers. Sectors are typically concentrated, with a few firms competing for the commodities produced by atomistic smallholders.

This structure of the market conduces to oligopsony power: firms have market power over farmers and are able to extract some of the surplus that the export market generates. The extent of oligopsony power depends on the number of competitors and relative size of each competitor (i.e., the distribution of market shares). Changes in the configuration of the market will thus affect the way that the firms interact with farmers. In principle, tighter competition induced by entry or policies that foster competition (e.g., merger or antitrust policies) can affect farm-gate prices and, therefore, household welfare and poverty. These issues have been studied in Africa (e.g., Porto, Depetris Chauvin, Olarreaga 2011), finding that increases in competition in export agriculture can indeed have strong impacts on poverty reduction, especially in rural areas.

Even if there is full pass-through of trade shocks to prices at the border, the transmission to households may still be imperfect because of transport and distribution costs and the structure of competition internally. Nicita (2009) studied Mexico, which aggressively opened the economy in the last 2 decades while domestic markets are poorly interconnected across regions. This creates different pass-through patterns (i.e., perfect and imperfect) across regions because location affects transport cost. Using ex-post econometrics based on household data, Nicita estimated different pass-through rates for agriculture and manufacturing. In agriculture, tariffs transmit to prices with a coefficient equal to 0.349, and distance does not matter (i.e., more homogenous, integrated, and thus competitive markets). In manufacturing, tariffs transmit to prices with a coefficient equal to 0.702 at the border. This pass-through declines significantly with distance; the pass-through at the border is 70%, 40% at 1,000 kilometers, and 20% at 2,000 kilometers.

2.4 Additional Issues

In the framework outlined in this section, households can adjust to trade shocks both on the consumption and income side. Consumption adjustment occurs when a household consumes less of more expensive goods due to trade and more of less-expensive goods. Income adjustment occurs when there are supply responses. In farm economies, the most relevant supply responses take place in agriculture and include, for instance, households switching from potatoes to cotton. In economies with more developed labor markets, labor supply decisions may be more important. Also, if labor markets are segmented, labor reallocation can play a major role in the quantification of the gains from trade (Artuc, Lederman, Porto 2015). In the Deaton (1989) framework, these types of adjustments are considered second order and are consequently small. While this is true in theory, the role of household adjustment becomes more sizeable when price changes are large (Friedman and Levinsohn 2002) and when extensive reforms covering many goods are considered (Ivanic and Martin 2008, Fajgelbaum and Khandelwal 2016).

The previous analysis omitted the responses of labor markets. Yet many households earn some of their living (and sometimes a large fraction of it) from wages. If wages depend on the prices of goods affected by the trade reforms, then these mechanisms should be incorporated when classifying households as net producers or net consumers. The impact of trade now suddenly depends on how wages respond to price changes. This, in turn, depends on whether labor markets are integrated or segmented and if there are spillovers and backward and forward linkages (Ravallion 1990, Porto 2005, Porto 2006). The way labor markets function may also depend on complementary domestic factors, including labor market regulations, labor laws, flexibility to hire and fire workers, and migration costs.

An important instance when the first-order approximation may fail is if the principle of separability does not hold. Under perfect markets, production decisions of a household are separated from its consumption decisions, and this separability result greatly simplifies the analysis. However, if markets are not perfect, then the net-consumer/ net-producer proposition is not satisfied, and the conclusions derived from it can be misleading.

Consider two examples of potential problems with the lack of separability (Brambilla, Porto, Tarozzi 2012). If labor markets are imperfect and limited off-farm employment opportunities exist, then the market wage will differ from the shadow wage of own labor and outside, hired labor. This affects how the welfare impacts of price changes are measured and invalidates the net benefit ratio (Deaton 1989). As another example, consider a case where there are imperfections in credit and capital markets, and households thus need to rely on own funding to finance productive investments. In this case, a decline in the prices of cash crops, which provide the only way to raise cash, can make the cash-in-advance constraint binding with severe repercussions for household welfare.[6]

Factors like access to credit, inputs, transport, education, and health affect adjustment both in consumption and production. If, for example, trade liberalization rises export crop prices but farmers cannot increase production because of bottlenecks due to lack of infrastructure, then gains from trade will not be realized. Balat, Brambilla, and Porto (2009) showed how marketing costs (i.e., the cost of reaching export markets) can hinder farm participation in exports in Uganda in coffee, tea, cotton, or fruits, thus eroding the poverty eradication impact of trade reforms.

The other role of the complementary agenda is related to separation of property. The principle of separation fails when there are market failures or missing markets, and often, these failures are associated with policies or distortions in the local economy. Cash constraints may be the result of credit constraints, which are the consequence of moral hazard and a deficient judicial system. Limitations in off-farm employment may arise because of monitoring costs or sluggish firm adjustment due to uncertainty about the rule of law. It is not clear whether the principle of separability holds. Benjamin (1992) found evidence that supports separability in Indonesia, but Le (2009, 2010) found evidence inconsistent with it in Viet Nam.

In the end, markets may work well in some cases and not in others. More importantly, the way the market works in different countries may depend on a complementary agenda. So far, the complementary agenda has been examined as factors limiting the responses of households to trade reforms. One way to visualize this is to think of trade reforms as causing price changes that reach households while these households cannot react due to insufficient complementarities.

A different view is when trade reforms do not reach some households. This idea is related to the imperfect price pass-through issue. In the trade poverty discussion, the theme of imperfect competition raises the issue of the organization of supply chains and competition policies. For instance, regarding rural markets and export crops, the structure of the supply chain may affect how prices transmit to the local economy, such as in African marketing boards. How changes in international prices filter down to producers depends to a large extent on the level of competition across different layers of the supply chain. In turn, the extent of competition may depend on domestic policies such as liberalization of internal markets and entry deregulation. Research on Zambia

[6] There are other examples of the problems created by market imperfections. Krivonos and Olarreaga (2009) and Porto (2008), for instance, showed how the conclusions of the first-order approach can change when there is unemployment in the labor market.

(Brambilla and Porto 2011) and Madagascar (Cadot, Dutoit, de Melo 2009) uncovered some interactions among market structure, household responses, and poverty impacts of trade.

Another reason why changes in border prices may not reach households is lack of complementarities (Cadot, Dutoit, Olarreaga 2010). For example, with deficient transport infrastructure, some regions in remote areas may become isolated from world markets if transport costs are prohibitive. If markets are isolated, producers will not be able to enjoy higher prices, but consumers will also be cushioned from them. Similarly, lower prices will not hurt producers but will not benefit consumers either (e.g., Nicita 2009).

Growth can indeed reduce absolute poverty if it affects the poor. There may be an unbalanced growth process favoring the rich more than the poor, but in the income- and expenditure-based definition of poverty, it is reasonable to argue that growth should be an engine of poverty reduction. For instance, Dollar and Kraay (2002) found that a 1.0% rise in real gross domestic product raises the income of the poorest by 1.2%. Ravallion (2001) estimated that a 1.0% increase in the mean income reduces, on average, the share of the population below the absolute poverty line by 2.5%.

The role of trade in fostering growth, however, is less clear. Trade liberalization allows for a more efficient use of resources, promotes gains in technical efficiency, induces gains from increasing returns to scale, and fosters technological change. Yet these positive impacts on growth may not take place if factor reallocations are costly due to factor market frictions and distortions or if trade induces specialization in low-growth industries. The available empirical evidence seems to favor the notion that trade is good for growth, but the studies are not totally convincing or conclusive.[7]

2.5 Illustrating the Mechanisms

There is little controversy about how households are affected by price changes, including those price changes brought about by trade policy. Households consume goods and services, benefit from price declines, and are hurt by price increases. In farm-households, some goods are also produced within the family, such as food crops (e.g., maize or rice) as well as cash or export crops (e.g., coffee, cotton, or cocoa). As producers, households are harmed by price declines and benefit from price increases. Since households are often both consumers and producers (especially of agricultural goods), higher prices hurt net consumers but benefit net producers (and vice versa). This is the net consumer-net producer proposition, originally discussed in Deaton (1989) and later adopted by many researchers.

Using the *Encuesta Nacional de Ingreso y Gasto de los Hogares* household survey in Mexico, the following exercise was based on Lederman and Porto (forthcoming). In the first panel of the following table, the first-order welfare impacts of a hypothetical increase of 20% in corn prices in rural Mexico were computed, perhaps caused by world trade liberalization in agriculture (Porto forthcoming). Net producers would enjoy gains equivalent to 1.78% of their initial (i.e., pre-price increase) average expenditure. Net consumers would suffer a loss of 1.93%. For the whole sample, the average

[7] For instance, Sachs and Warner (1995) used cross-country regressions to suggest that openness is associated with faster growth, and Dollar and Kraay (2004) used decade-over-decade changes in the volume of trade as an imperfect proxy for changes in trade policy. In a dataset spanning 100 countries, they found that changes in growth rates are highly correlated with changes in trade volumes, controlling for lagged growth and addressing a variety of econometric difficulties.

impact of an increase in corn prices is negative, but small (i.e., equivalent to only 0.39% of average national income).

Prices, Trade, and Poverty

	Net Producers	Net Consumers	All
First-Order Effects			
Consumption effects	(0.99)	(2.70)	(1.99)
Production effects	2.78	0.77	1.60
Net effects	1.78	(1.93)	(0.39)
Segmented Labor Markets			
Income effects	7.22	1.99	4.16
Net effects	6.23	(0.71)	2.17
Labor Market Spillovers			
Income effects	10.77	3.14	6.31
Net effects	9.78	0.44	4.32
Second-Order Effects			
Consumption effects	(0.93)	(2.53)	(1.87)
Production effects	3.05	0.84	1.76
Net effects	2.12	(1.69)	(0.11)
Complementary Factors			
Income effects	5.55	1.53	3.20
Net effects	4.56	(1.17)	1.21

Source: Authors' calculations based on Porto (forthcoming).
( ) = negative

In the second panel, labor markets are assumed to be segmented; thus, only wages in the agricultural sector can respond to corn prices. A wage-price elasticity of 0.40 was used (as estimated in Porto 2008). The income gains of net producers jump to 7.22%, and their net gain is now 6.23%—nearly 3.5 times higher than before. For net consumers, the income gains are more modest, of around 1.99%, and these gains are not enough to offset the consumption losses. In the end, even with wage responses, net consumers would lose from higher corn prices. The national average effect would, however, be positive, as higher corn prices would bring welfare increases of 2.17% on average.

In another example, spillovers from corn prices to the wages of self-employed individuals are allowed in rural areas. The idea is that increases in agricultural prices may raise the derived demand for labor in services, odd jobs, and, more generally, in local rural labor markets. Using the same wage-price elasticity as before (0.40), the following welfare impacts were estimated: (i) the income gain of net producers would be equivalent to 10.22% of their initial income, and the net gain would be 9.78%; (ii) net consumers would also gain, with an income gain of 3.44% and a net gain of 0.44%; and (iii) the average national gain would be equivalent to 4.32% on initial income.

Turning to the role of household adjustments, an example is shown in the fourth panel of the table, where consumption substitutions and supply responses were estimated.[8] Allowing for consumption and production second-order effects does not affect the results. The gains for net producers are slightly larger, and the losses for net

[8] A full set of demand elasticities is in Porto (2015). For the purpose of this analysis, a corn-supply elasticity of 1 was assumed.

consumers are slightly smaller, but the welfare impacts are not affected much. As pointed out above, however, these conclusions may change if price changes are large or if many goods produced and consumed are affected simultaneously (as it is likely to be the case in actual trade reforms).

Finally, an example of the role of complementarities in the case of corn in Mexico is in the fifth panel of the table. Concurrently with the increase in corn prices, it was assumed there are also complementary factors that allow farmers to expand corn production at no additional cost. This could occur, for example, due to productivity gains arising from transport, education, or extension services.[9] The complementary agenda can play a significant role in boosting welfare gains. Compared to the first-order effects of the first panel, net gains for net producers were estimated at 4.56% (instead of 1.78%) and net losses for net consumers at 1.17% (instead of 1.93%). Interestingly, when the complementary agenda kicks in, the national average loss of 0.39% turns into a national average gain of 1.21%.

3. TRADE LIBERALIZATION AND POVERTY

In this section, an empirical exercise measured the impacts of trade liberalization in several developing or low-income countries in Africa. Household survey data were used for each country to measure the consumption effects, the income effect (including both the sales effects and the labor income effects), and the overall effects of trade policy. The surveys used were Ghana Living Standards Survey 1998, 1998 National Household Poverty Survey Report of the Gambia, Malawi Second Integrated Household Survey 2004–2005, Nigeria Living Standards Survey 2003–2004, Uganda National Household Survey 2005–2006, and South Africa Income and Expenditure Survey 2010–2011.[10] From the surveys, expenditures and income variables were constructed, as well as an aggregate measure of household welfare, namely, the level of per capita expenditure (at the household level). Budget shares, income shares, and labor income shares were also computed to calculate first-order approximations.

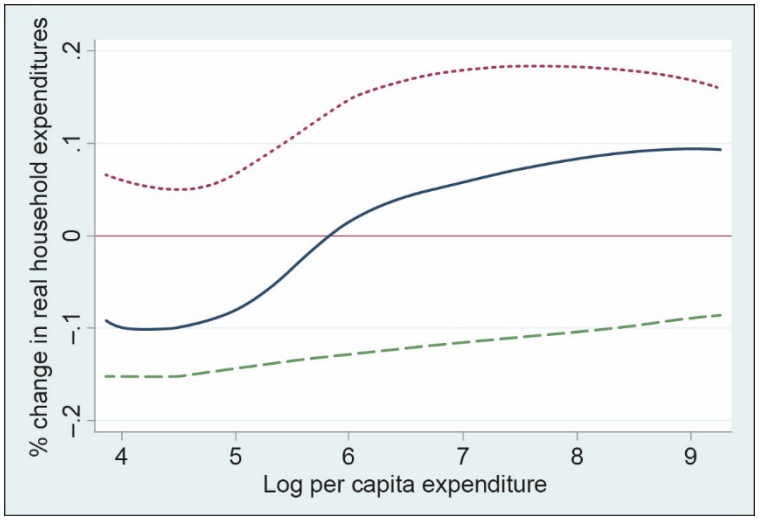
The trade liberalization episode considered here was a full elimination of own tariffs. A full pass-through was assumed so that price changes are approximately equal to the negative of the initial level of tariffs.[11] This allowed calculation of the welfare effects by multiplying the price changes with income and budget shares. To describe the results, average effects were computed conditional on the level of well-being of different households using standard nonparametric techniques, allowing exploration of the impacts across income distribution, the poor, the middle class, and richer households. Results are reported in Figures 1 to 6. Each of the six case studies uncovers different patterns of effects.

[9] See the case studies in Hoekman and Olarreaga (2007) for details.

[10] Details on these surveys can be found in Porto, Depetris Chauvin, and Olarreaga (2012) and Nicita, Olarreaga, and Porto (2014).

[11] This exercise follows the analysis of Nicita, Olarreaga, and Porto (2014).

Figure 1: Nigeria



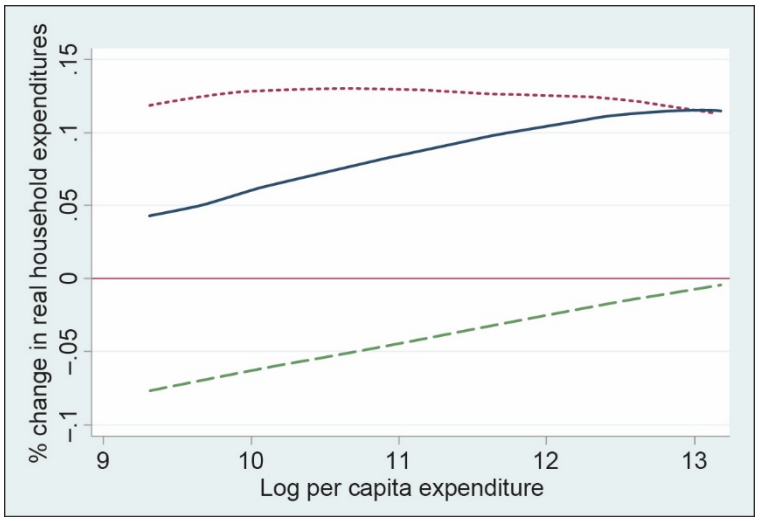
Source: Nigeria Living Standards Survey 2003–2004.

Notes:

1. The short-dash curve represents in consumption mechanism; the long-dash curve, the income mechanism; and the solid curve is the overall welfare effect of trade policy.
2. The curves are estimated with nonparametric Kernel regressions.

In Nigeria, on average, the poorest households lose with tariff cuts, while richer households gain (Figure 1). This goes against the poverty reduction goal. The consumption effects are positive for all households, while the income effects are negative. The income losses for the poor dominate their consumption gains. Instead, the consumption gains for the richer households (which are larger than those of poorer families) dominate their income losses (which in turn are smaller than those of poorer families).

Figure 2: Ghana



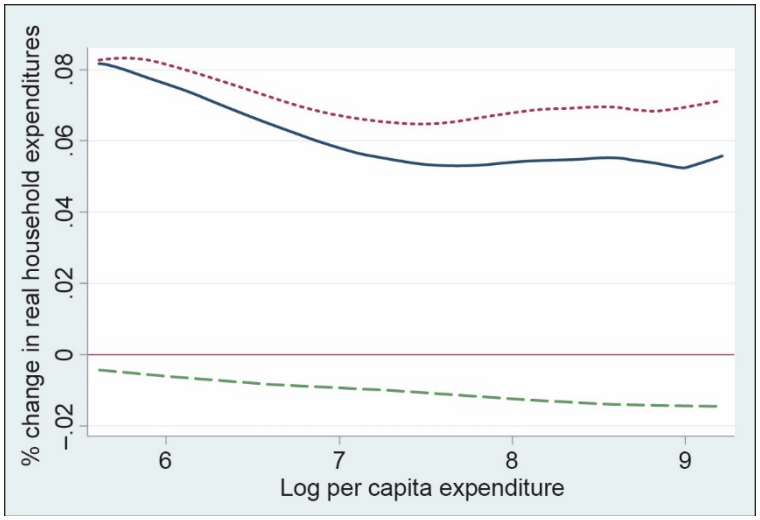
Source: Ghana Living Standards Survey 1998.

Notes:

1. The short-dash curve represents in consumption mechanism; the long-dash curve, the income mechanism; and the solid curve is the overall welfare effect of trade policy.
2. The curves are estimated with nonparametric Kernel regressions.

In Ghana, the overall effects of trade liberalization are positive, on average, for everyone (Figure 2). The impacts are larger for richer households, so trade is pro-rich. This is driven by two mechanisms: the consumption effects are positive and roughly similar across households, while the income effects are negative, but smaller for richer households.

Figure 3: Malawi



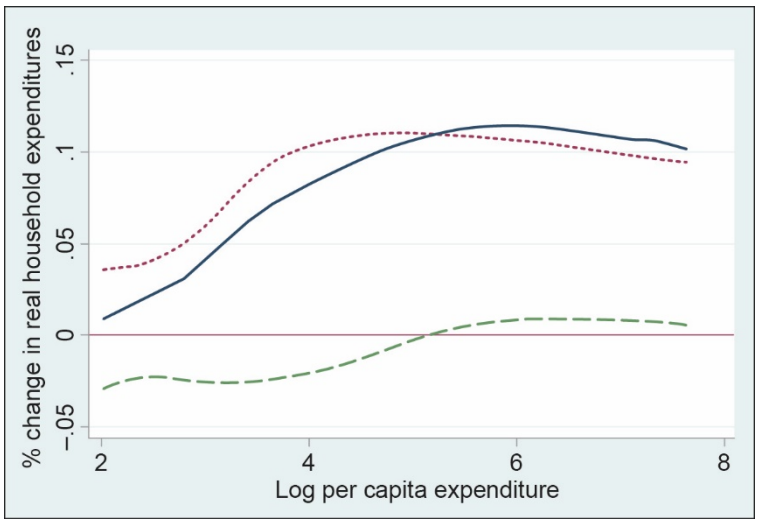
Source: Malawi Second Integrated Household Survey 2004–2005.

Notes:

1. The short-dash curve represents in consumption mechanism; the long-dash curve, the income mechanism; and the solid curve is the overall welfare effect of trade policy.
2. The curves are estimated with nonparametric Kernel regressions.

Figure 3 shows the case of Malawi. It is similar to Ghana in that the overall effects are positive, on average, for all households. It is different from Ghana in that the poorer households seem to benefit more than the richer ones.

Figure 4: The Gambia



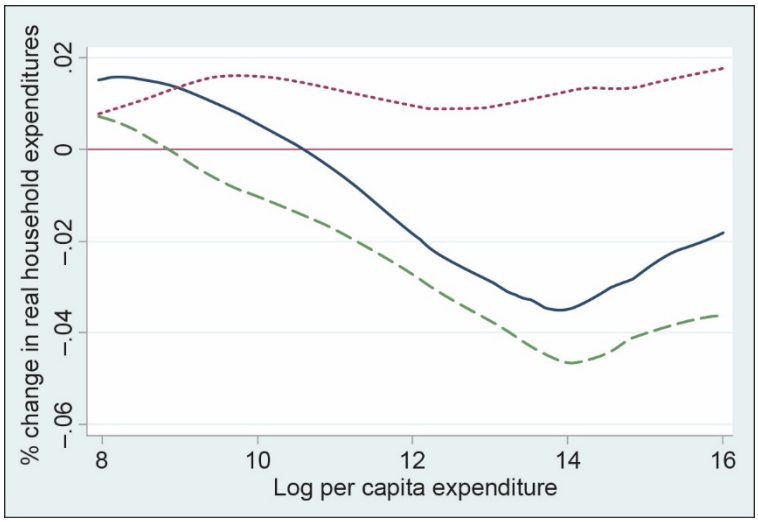
Source: 1998 National Household Poverty Survey Report of the Gambia.

Notes:

1. The short-dash curve represents in consumption mechanism; the long-dash curve, the income mechanism; and the solid curve is the overall welfare effect of trade policy.
2. The curves are estimated with nonparametric Kernel regressions.

A different pattern emerges for The Gambia (Figure 4). The overall effects are positive, on average, for all households, as in Ghana and Malawi. Unlike all the previous cases, however, the poor gain from the consumption mechanism, but they lose from the income mechanisms. Richer families are benefitted both on the consumption and income sides.

Figure 5: Uganda



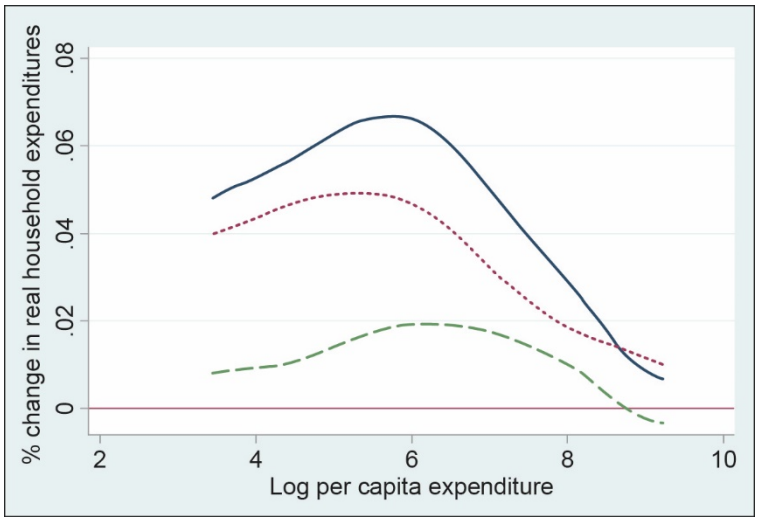
Source: Uganda National Household Survey 2005–2006.

Notes:

1. The short-dash curve represents in consumption mechanism; the long-dash curve, the income mechanism; and the solid curve is the overall welfare effect of trade policy.
2. The curves are estimated with nonparametric Kernel regressions.

Uganda (Figure 5) displays yet another pattern. Here, the overall effects are positive for the poor and negative for the rich. While the consumption effects are similar across households, the income effects are negative and much larger for richer households.

Figure 6: South Africa



Source: South Africa Income and Expenditure Survey 2010–2011.

Notes:

1. The short-dash curve represents in consumption mechanism; the long-dash curve, the income mechanism; and the solid curve is the overall welfare effect of trade policy.
2. The curves are estimated with nonparametric Kernel regressions.

Finally, South Africa (Figure 6) displays a case where the overall effects are positive, and both the consumption and income effects are positive as well.

4. TRADE AND COMPLEMENTARY POLICIES

While there are strong theoretical grounds to advocate for gains from trade, it is not obvious that they can be realized in practice. Also, even if there are aggregate gains from trade, there will most likely be winners and losers from trade reforms. The losers may, or may not, be the poor. Indeed, the impacts are heterogeneous, not only within a country (i.e., across the income distribution) but also across countries. To a large extent, this is because the effects of trade policies depend on the economic environment, such as differences in endowments across households and countries, frictions in factor markets, the extent of imperfect competition, and the economic policy setting (e.g., other taxes, distortions, and the institutional framework). It is, therefore, difficult to identify a set of good policies that should accompany trade reforms to make the most of any trade liberalization episode. This is not inherent to trade policy; it is a more general conclusion in various policy forums.

An example is the book edited by Cohen and Easterly (2012), *What Works in Development: Thinking Big and Thinking Small.* In this volume, Cohen and Easterly compiled several papers from renowned experts on policies that work for development and, in particular, on whether academics and policy makers should focus on big answers and policies (i.e., “thinking big”) or smaller projects (i.e., “thinking small”). One of the reasons why people tend to see a crisis in the thinking big approach is because of how difficult it is to pin down major growth determinants. Durlauf, Johnson, and Temple (2005) identified 143 determinants of growth and 41 theories to explain it. With an extreme approach, Levine and Renelt (1992) found, however, that only a few of those determinants are robust. More lenient approaches identify a few more robust variables, but still too many. The Commission on Growth and Development (2008) summarized, “It is hard to know how the economy will respond to a policy, and the right answer in the present moment may not apply in the future.”

Similar conclusions apply to the complementary agenda to trade reforms. Trade liberalization is good, in aggregate and across the income distribution, including the poor. Yet trade liberalization must be accompanied by sound supporting policies. The set of policies that are likely to be convenient include those that facilitate trade and transmit trade policy, such as trade facilitation measures and competition policies in traded sectors; smooth adjustments in factor markets, such as labor market frictions and capital reallocation costs; encourage specialization in goods with comparative advantage, such as technical advice or input adoption; and help the losers in the short term and make them winners in the longer term.

5. CONCLUSIONS

In this paper, whether trade can help or hinder the achievement of the poverty eradication goal of the United Nations Sustainable Development Goals was explored. The general impression that emerges from the literature and empirical exercises is that trade can be conducive to positive welfare effects for all types of households, including the poor. However, these effects are heterogeneous, even conditional of broad household characteristics. In principle, thus, it is possible to observe poor households both benefiting from trade liberalization and being hurt by trade reforms. The impacts depend on consumption and production patterns, household endowments, and household characteristics (e.g., demographic or geographic).

In addition, there is consensus that trade liberalization needs to be accompanied by complementary policies, either to boost the gains from trade or to ameliorate potential negative impacts. The design of the complementary agenda is difficult to establish because countries are heterogeneous in their characteristics. Specific policy advocacy requires a careful examination of the environment in which trade liberalization may take place and on the policy and institutional context in which it happens.

Overall, a well-structured trade liberalization agenda, together with a sound complementary agenda, are very likely to help reach the Sustainable Development Goal. Trade is certainly not the only element in play, but it can be an important contributing factor.

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