Trade Liberalization and Poverty: What Have We Learned in a Decade?

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Keywords

Abstract

This article reviews key recent literature on the effects of trade liberalization on poverty in developing countries and asks whether our knowledge has changed significantly over a decade. The conclusion that liberalization generally boosts income and thus reduces poverty has not changed; some authors suggest that this finding is not true for very poor countries, but this suggestion is far from proven at present. With regard to microeconomics, recent literature again confirms that liberalization has very heterogeneous effects on poor households, depending, inter alia, on what trade policies are liberalized and how the household earns its living. Working in the export sector predicts gains, and working in the import-competing sector predicts losses, a finding that is reinforced by studies of the effects of liberalization on wages. New research has suggested several ways in which intrasectoral wage inequality is increased by trade, but this research generally does not indicate that the poor actually lose. A fairly common finding is that female workers gain from trade liberalization.

INTRODUCTION

The last decade of the twentieth century started off with a huge enthusiasm for free markets as the route to economic progress. One manifestation was the euphoria following the creation of the World Trade Organization, which was viewed as the crowning glory of the Uruguay Round of trade talks that ended in 1994. Those talks had already resulted in a good deal of trade liberalization, and the international community immediately set off with an ambitious agenda to widen and deepen the liberalization. Within a few years, however, voices were raised against unrestrained trade liberalization, culminating in the riots at the third WTO Ministerial Meeting in Seattle in 1999. Prominent among the criticisms was that trade liberalization was bad for the poor and/or created poverty in the developing world (see, for example, Oxfam 1999). Surprisingly, the economics profession had rather little with which to address these accusations; the Stolper-Samuelson theorem, for all its elegance, seemed to have little to say on the ground.

With this background, and with support from the UK's Department for International Development (DFID), one of us set off to document what we did actually know about trade liberalization and extreme poverty in a series of publications such as McCulloch et al. (2001), Winters (2002), and Winters et al. (2004). This article asks whether the experience and the large research effort of the past dozen years have changed the conclusions of that research program. The answer is, "not a great deal, but we are now more confident about some of the findings."

Winters et al. (2004) conclude that there can be no simple general conclusion about the relationship between trade liberalization and poverty. There is a strong presumption that trade liberalization will be poverty reducing in the long run and on average through its effects on the level of national income, but there is no guarantee that the static and microeconomic effects will always be beneficial for the poor. Trade liberalization will almost inevitably reduce the well-being of some people (at least in the short term), and some of these may be poor: Its precise effects depend, inter alia, on factors such as the preliberalization economic situation, the trade reforms undertaken, who the poor are, and how they sustain themselves. On the plus side, however, poverty effects are relatively straightforward to predict, provided that analysts garner the basic information required, and so liberalization may be tailored to avoid the worst poverty impacts and may be accompanied by targeted compensatory measures.

Following Winters (2002), Winters et al. (2004) group their survey of empirical results around four themes. One is macroeconomic—economic growth—and the other three refer to microeconomic channels through which shocks and policy interventions at the border (trade shocks and trade policy) are transmitted to the poor: households and markets, factor markets (in effect labor markets), and government revenue. In each case, the survey explores what we know about a few key questions. Similarly, this article starts with the macroeconomic questions of growth and productivity and then moves to the microeconomics; but now, taking the earlier taxonomy as given, it divides the literature less by channel of causation than by principal source of evidence. Thus, under households and markets, we examine papers that look directly at the outcomes for households by using household survey data. These papers include outcomes transmitted through labor markets and/or the government account but seek to identify the overall effects of liberalization on household income. When we turn to labor markets, the approach is to focus on how liberalization changes wages—especially those of the poor or of the poor relative to the better off. Because we look at real wages, the transmission of price shocks frequently contributes to the outcome, but the key difference from the previous section is that only labor incomes are considered. These incomes are only part of the poverty story, but the differences between households reside so much more heavily in differences in the way that they earn their livelihoods than in differences in their consumption bundles that a focus on labor incomes can be an appropriate simplification.

Winters et al. (2004) argue strongly that the question of whether trade liberalization reduces or increases poverty is an empirical one, and this remains our position. Thus, the work we survey is ex post and based on real data about actual outcomes and real policies, although we briefly allude to simulation exercises when it is useful to do so. For reasons of space, however, we do not go into computable general equilibrium (CGE) modeling.

Finally, the work on which we report needs a definition of poverty. Poverty is correctly seen as multidimensional (e.g., Sen 1993 and Alkire & Foster 2011), but in most empirical economics, authors rely on simple income measures. Although how and where to draw the poverty line and how to aggregate across individuals to obtain average results are hugely important, these are not dimensions that we have space to pursue here.

TRADE LIBERALIZATION, GROWTH, AND POVERTY

Economists have long believed that economic growth reduces poverty, and although it cannot be demonstrated always to do so, Kraay (2006) suggests that, for periods of approximately 7 years or more, economic growth is by far the largest determinant of a country's success in reducing poverty.[1] This result is relevant because there is also a strong belief that trade liberalization boosts economic growth. Winters (2004) surveys the literature up to the turn of the century and concludes that there was indeed a reasonable presumption that this belief was true, but that the empirical literature faced a number of serious challenges in establishing it beyond doubt. The challenges included defining and measuring the openness of an economy, establishing the causal links between trade liberalization and growth (or, equivalently, trade and income), and separating openness from other policies that might affect growth (the attribution problem). Since 2004, the literature has continued to multiply, with arguably the greatest strides taken in terms of causation and the heterogeneity of responses across countries. Both of these issues are critical in policy terms: Establishing causation is the sine qua non of policy advice, whereas recognizing differences across countries is an essential part of the tailoring of policy to the real world.

The causality problem is most pressing if one uses the trade-to-GDP ratio as the indicator of openness: Economic growth may clearly lead to higher exports and/or imports as well as be caused by them, but similar issues may arise with policy-based measures (Winters 2004). The common approach to dealing with endogeneity problems is to use instrumental variables to isolate a genuinely exogenous component in the potentially compromised explanatory variable and to see whether that component has the predicted explanatory power. As Deaton (2009) stresses, one must be able to explain why the instrument is not only exogenous but also excludable from the main relationship being estimated. The latter means not only that the instrument should play no role in the explanation of the dependent variable, other than via the variable it is instrumenting, but also that one should be confident that it is uncorrelated with the error term in that equation. Bazzi & Clemens (2013) point out that such excludability implies that if one is using instrument Z for openness in one's growth equation, one strictly has to believe that every other study that has used Z as an instrument for some other variable in a growth equation (e.g., for aid flows, investment, trade partners' growth) is completely wrong. Otherwise, Z will be correlated with the errors in one's own equation. This requirement is very demanding.

Following Frankel & Romer (1999), trade economists thought they had a good story. If one sets aside the possible endogeneity of national borders, geography seemed to provide good exogenous

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[1]This is not to say, as is sometimes claimed, that redistribution does not matter for poverty reduction; maybe redistribution was not tried very much in Kraay's (2006) samples.

instruments for trade links and hence openness. Thus, for example, when Noguer & Siscart (2005) improved on Frankel & Romer by using a fuller data set for the instruments, their estimate that a 1% increase in openness induced, on average, a 1% increase in GDP per capita seemed strong and robust. However, Bazzi & Clemens (2013, table 5) subsequently showed that country size had been used as an instrument for several other variables in growth equations and that, without country size, other instruments are usually weak.

Even before Bazzi & Clemens (2013), the problem of using time-invariant geographical instruments was identified by Feyrer (2009), who argues that variability through time is potentially less prone to confounding by omitted variables. He exploits relative differences in the sea and air distance between trade partners: For example, Rotterdam–New York is virtually the same distance by sea and air, but Rotterdam–Tianjin is not. These differences became important in explaining trade flows as air travel became cheaper: Trade routes with relatively long air distances became relatively cheaper and were hence used more. Feyrer uses several panel techniques to estimate the links between trade and growth and concludes that an increase of 1% in the volume of trade raises output per head by ∼0.5%. A further time-variant instrument for openness is US tariffs, which presumably affect countries' ability to export; Romalis (2007) uses this instrument to suggest that openness has strong growth effects. The problem, however, is that tariffs vary systematically by commodity so that Romalis's results may be reflecting other commodity-specific factors rather than tariff levels per se. Also, many would argue that tariff levels affect the level of income, and not the growth rate directly as Romalis assumes.

Time variation plays a direct role in many studies of the effect of trade liberalization. For example, Wacziarg & Welch (2008) and Kneller et al. (2008) explore the differences in growth rates before and after liberalization and find that liberalization is followed by higher values of openness, investment, and growth, although with a good deal of heterogeneity between countries, to which we turn below. The problem with the before-and-after approach is the lack of, or the lack of specificity in, a control group.

Billmeier & Nannicini's (2009, 2013) synthetic-control-groups approach offers a possible solution to the latter problem. For each liberalizer, they define a small control group from the liberalizer's region that has reasonably similar weighted GDP per capita and GDP per capita growth compared with the target country over the 10 years preceding the liberalization. The liberalization effect is then the difference in GDP per capita growth between the liberalizer and the control group over the subsequent 10 years. Trade liberalizations generally appear to be followed by significant upturns, but recent liberalizations, most of which are in Africa, are an exception, which the authors attribute to African countries being late entrants into an already liberalized world and to their agricultural specialization. This methodology is potentially fruitful but arguably still requires some fine tuning: Neither using China as a control for Cape Verde nor concluding that Chile lost from its trade liberalization seems plausible to us.

The classic time-series approach to causality is Granger causality, but it is seriously compromised if anticipation plays a role, as is plausible in policy matters. Nonetheless, the simple descriptions of whether growth follows liberalization or vice versa may still be useful. Among studies that identify some causation running from trade to income as well as back again are Awokuse (2005), on South Korea from 1963 to 2001; Gries et al. (2009), on 16 sub-Saharan Africa (SSA) countries from 1970 to 2003; Gries & Redlin (2012), also on Africa; and Sakyi et al. (2012), on middle-income countries. Reverse feedback from income to trade is sometimes presented as diluting the policy advice in favor of liberalization, but as long as some causation is established from trade to growth, the reverse feedback provides positive reinforcement of the benefits of opening up.

An obvious extension of the studies above, once we have sufficient data to do the estimation, is to ask whether the effects of trade liberalization are conditional. Since 2000, a number of studies

have pursued this route and suggest that the growth effects of trade liberalization may be weaker or absent for low-income countries. This line of inquiry at least raises the possibility that trade liberalization does not aid poverty reduction among the very poorest. For example, Bhattacharyya et al. (2009) suggest that the benefits of openness depend on institutional quality, and Kneller et al. (2008) suggest that postliberalization growth effects are more positive with higher quality of intermediate goods and with higher mean years of secondary and tertiary education in the initial situation.[2]

Two studies attempt to condition the growth effect of trade liberalization on policy stances. First, Bolaky & Freund (2008) conduct a cross-section exercise on early-2000s GDP per capita levels and growth for 126 countries, using Doing Business indicators to measure the investment climate and economic flexibility. They examine the interactions between (a) the trade share and (b) each, in turn, of the ease of firm entry, labor market flexibility, and the strength of property rights. In each case, increased flexibility significantly enhances the benefits of openness. They also consider (again in turn) interactions with education levels, financial development, and the role of law and similarly conclude that better performance in these dimensions enhances openness. In all cases, countries that rank very poorly in a measure of flexibility or development apparently lose from increased openness, although not statistically significantly.

Chang et al. (2009) likewise examine interactions with a number of complementary factors that may affect the impact of trade openness on growth. Chang et al. apply panel methods to growth over 5-year periods in 82 countries over 1980–2000. Although, on average, trade openness has a strongly positive impact on growth, various second-generation reforms can affect the extent to which countries can take advantage of being open. Countries with weak education, high inflation, weak telecoms, weak governance, inflexible labor markets, or inflexible firm entry or exit may not benefit from openness. The thresholds for experiencing harm are low, but within current ranges of experience, so again poor countries may be vulnerable to losses.

Like several of the time-series studies, these two papers suggest that trade liberalization has been less beneficial for the (mostly African) poor countries that liberalized later, but they cannot say why. All the interaction variables sort countries roughly by level of development, and, because they are highly correlated and tested only one by one, all of them pick up basically the same empirical phenomenon. Thus, estimations may be picking up the facts that the liberalizations for poor countries refer mostly to African countries in the 1980s and 1990s and that these countries had disappointing growth performance for reasons quite independent of their trade policies.[3] Thus, although one clearly needs to recognize the reservation about trade liberalization that these results imply for poor countries, concluding that there are no benefits is premature. Rather, we need research to disentangle and distinguish the heterogeneities.

The past decade has seen an explosion in studies of the effects of trade liberalization on individual firms on the basis of the new availability of firm-level data. The almost universal conclusion is that trade liberalization increases average productivity in the sectors that it affects. This result follows from the seminal theoretical paper on firms and trade, Melitz (2003), which stresses selectivity effects. Increased opportunities to export and competition from imports favor more efficient firms, and so factors tend to migrate in their direction (see, for example, Fernandes 2007).

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[2]Additionally, DeJong & Ripoll (2006) suggest that the higher a country's initial level of income is, the stronger growth effects are, but Bazzi & Clemens (2013) criticize their identification strategy.

[3]A further caution is that the functional form used in these studies imposes identical interactions at all levels of income; thus, if middle-income countries gain less from openness than do high-income ones, the estimates must show that low-income ones fare worse still. The same limitation applies to all the rigidities that Chang et al. (2009) explore.

Increased trade or trade liberalization also affects productivity through other channels. Amiti & Konings (2007) argue that Indonesian liberalization from 1991 to 2000 raised productivity by allowing local firms a greater selection of intermediate inputs. Goldberg et al. (2010) find similar effects in India, with the main effect being improved access to new intermediates rather than lower prices of the ones that firms already use. Almeida & Fernandes (2008) associate trade with technology transfers in a large sample of developing countries.

All these findings seem like good news for poverty reduction because higher productivity is the only basis for sustainably higher incomes and hence for economic growth. However, there is the danger that, as liberalized sectors become more efficient, they also become smaller and the labor they shed moves into even less productive activities. Such an outcome would reduce aggregate output if the intersectoral displacement effect outweighed the intrasectoral productivity increase. McMillan & Rodrik's (2011) study of structural change in developing countries suggests that this has been a problem for non-Asian countries since 1980 (not just following trade liberalizations), although earlier work by Timmer & de Vries (2009), who compiled the definitive data set, is less pessimistic about the trade-off between productivity and structural change.

All told, the evidence is very strong that greater openness is generally associated with higher levels of income and, equivalently, that trade liberalization is associated with temporary increases in growth. The relationship appears to be causal but is not absolutely invariable. There is some evidence that the strength of the relationship depends on policies inducing flexibility in economies and on conditions, such as human capital, infrastructure, and the rule of law, that allow output to expand. Very poor countries may not benefit from liberalizations, but this possibility is not, in our judgment, an established result.

HOUSEHOLDS AND MARKETS

This section summarizes some of the research that focuses directly on household outcomes based on the results of household surveys. Winters's (2002) and Winters et al.'s (2004) earlier conclusion is that, although many of the effects of trade policy on poverty are fairly predictable, they display great heterogeneity, and thus general conclusions are impossible to draw.

The simplest starting point is the observation that, given labor and transfer incomes, the first-order approximation to the welfare effect of a small change in the price of a single good, i, that households might both produce and consume is

$$\Delta W = (q_i - c_i)\Delta p_i, \tag{1}$$

where q_i is production, c_i consumption, and Δp_i the price change in good i (see Deaton 1997 for an example). An obvious example of the use of Equation 1 is in several articles on the effects of the food price boom on poverty. For example, Ivanic et al. (2012) consider the boom in 2010 in the prices of 38 agricultural commodities by using detailed data on patterns of production and consumption in 28 countries. They find "considerable heterogeneity in the impacts, but estimate that poverty rose by 44 million people, with 68 million people falling into poverty and 24 million people raised out of poverty at the extreme poverty line of $1.25 per day." This result is analytically useful, but we highlight "rose" in the quotation because the approach is one of simulation modeling so that the conclusion is a prediction rather than a measured outcome: Welfare is unobservable, and much more could be happening than is implied by Equation 1.

Similar first-order exercises are presented by de Janvry & Sadoulet (2010) on food prices in Guatemala and by Porto (2010) on improvements in access to export markets for Argentinean households. The former find that price transmission from the border to poor households is quite weak and that many farm households are net consumers of food.

These studies simulate what are typically short-run effects that do not consider dynamic spillover effects, in particular on rural wages. Jacoby (2013), accounting for such wage responses in India, finds that rural households across the entire income distribution gain from higher food prices. A key determinant of the extent of the gains is the degree of labor mobility across sectors of the economy. The gains are much higher with perfect mobility than where labor markets are segmented, which in turn highlights the importance of labor mobility in the adjustment process, a topic we return to below. Along the same lines, Ivanic & Martin (2011) find that taking into account dynamic responses on the demand and supply sides substantially reduces the adverse impact on poverty, although for most of the crops/countries considered, this impact remains negative.

A more sophisticated first-order exercise is presented in the elegant paper by Porto (2006) on the distributional effects on Argentinean households of the tariff changes implied by the creation of Mercosur. Porto takes theory seriously and uses the neoclassical model to derive simple, semi–reduced-form equations that he can estimate and substitute into an expression that relates the change in welfare to the change in tariffs from 1992 to 1996. The starting point is an indirect utility function presumed to apply to every household, j:

$$u_j = v(p, x_j) \equiv v(p_{\mathrm{T}}, p_{\mathrm{NT}}, x_j), \tag{2}$$

where u is utility; p is the vector of prices, disaggregated into vectors of traded (T) and nontraded (NT) prices; and x is income. Differentiating with respect to p_{T}—the prices that are changed by trade reforms—Porto obtains the following equation for the negative proportionate compensating variation for household j:

$$\frac{\mathrm{d}x_0^j}{e^j} = \left(s_i^j + \sum_{k \in \mathrm{NT}} s_k^j \frac{\partial \ln p_k}{\partial \ln p_i} - \sum_m \theta_m^j \varepsilon_{wmpi}^j \right) \frac{\partial \ln p_i}{\partial \ln \tau_i} \mathrm{d} \ln \tau_i, \tag{3}$$

where s_i^j is j's budget share spent on good i, θ_m^j is the share of the labor income of household member m in total family income, and τ_i is the power of the tariff on i. The wage-price elasticities, ε_{wmpi}^j, capture the proportional change in the wage earned by family member m caused by a given proportional change in the price of good i.

The budget shares of different goods (s_i^j) and different sources of labor income (θ_m^j) for each of 21,127 households are calculated from a household survey. To obtain the Stolper-Samuelson coefficients, Porto (2006) estimates simple equations relating the wages for three kinds of labor to four traded goods prices. Then given that nontraded goods prices are determined by the equality of demand and supply—which depends on traded goods prices and wages, which, in turn, are determined by traded goods prices—he estimates the relationship between traded and three nontraded goods prices. Porto considers the tariff changes implied by Mercosur by weighting together the intra-Mercosur and extra-Mercosur rates and assumes that tariffs are fully passed through to the internal prices of traded goods. Once he has the implied welfare changes by household from Equation 3, he nonparametrically estimates the relationship between welfare change and initial income to identify how the trade policy change affected different parts of society.

Porto (2006) finds that Mercosur was progressive in its effects because its common external tariff on food and agriculture exceeded Argentina's initial tariff. Thus, the creation of Mercosur increased agricultural protection and domestic prices, whereas other sectors experienced significant declines in protection. The poor have higher budget shares on food than the rich and also higher shares on the nontraded sector housing, transport, and communication, the price of which depend strongly on food and agriculture prices. Thus, the consumption effects harmed the poor, whereas richer households gained because other goods, which figured relatively more heavily in

their budgets, experienced price declines. The labor effects, in contrast, were strongly progressive because unskilled wages depend positively on food and agricultural prices, whereas college-educated labor's wages depend negatively on such prices and depend positively on more sophisticated traded goods prices. Households are more specialized in their income sources than in their consumption baskets, and so the differences between households are driven mostly by the wage effects, which, in this case, benefit the poor and harm the rich.

This relatively detailed account of Porto (2006) emphasizes how case specific the microeconomic elements of the trade and poverty story are. Even if the links from traded goods prices to nontraded goods prices and wages could be generalized to other countries, the final results would depend on how liberalization changed the pattern of protection in those countries.

Nicita (2009), who studies Mexico and NAFTA, uses the same approach as Porto (2006) does. He replaces Porto's small open-economy assumption with estimates of the pass-through from border prices to the internal prices of traded goods. The pass-through coefficients are allowed to vary by state and show a marked tendency to decline with distance from the border with the United States. (The bulk of Mexico's trade is with the United States.) He also differs from Porto in not explicitly considering nontraded goods prices and in allowing the prices of agricultural goods to affect farm households' incomes as well as consumption. Nicita suggests that NAFTA's effects were small but regressive, the poorest gaining approximately 1% of initial income and the rich 2%. The net effect was uneven geographically, with the southern states barely gaining in income terms and the northern ones gaining more than 2.5% of initial income. Marchand (2012) reports similar results on India: He draws a rural-urban distinction and, like Nicita, finds pass-through coefficients of well below 100%. He finds that liberalization favored the urban sector more than the rural sector but that it was pro-poor in both. Nicita et al. (2014), using a similar framework, look at the pro-poor bias in the structure of protection of six countries in SSA and finds that SSA countries' own trade policies tend to be in favor of poor households, whereas the rest of the world's trade policies are biased in favor of SSA's rich households. The implication is that poor SSA households would benefit relatively more from a reduction in trade protection of SSA's trading partners than from their own liberalization.

Porto's (2006) method is elegant and persuasive, but very low dimensionality is required for the estimation to be feasible. One extension therefore is to increase the dimensionality and to sacrifice estimation. This is the approach of CGE simulation modeling, in which relatively detailed structural equations are used to make predictions but in which, for lack of data, less effort can be devoted to estimating the behavioral relationships. Examples of this approach are found in Hertel & Winters (2006), Hoekman & Olarreaga (2007), and Hertel et al. (2009) on the poverty effects of the WTO's Doha Round. This literature reinforces the result that the principal source of heterogeneity between households is their sources of income, and shows that, at the level of individual sectors or regions, the analysis of poverty depends heavily on quite specific features of the case in hand.

We move now from predictions of welfare changes à la Porto (2006) to actual changes, which are usually measured by changes in household real consumption. As noted above, we now encounter the attribution problem, for many things may explain the single observation of the change in consumption. Notionally, the approach requires estimates of the following equation:

$$\Delta \ln rc_j = \ldots \ldots \beta \left(\Sigma_i w_{ji} \Delta \ln \tau_i \right) + \text{controls} + u_j, \tag{4}$$

where rc_j is real consumption, w_{ji} are (known) weights reflecting authors' views of the transmission of changes in tariff i to household j, $\Delta \ln \tau_i$ are the tariffs (or trade policy) that are changed, and the term controls represents a series of other variables that might explain the evolution of consumption. In this reduced-form equation, the w_{ji} capture all the economics of interest. The w_{ji} include the first-order

effects of the sort seen above and the second-order effects in response to the trade shock. In practice, however, the w_{ji} are extremely difficult to determine, so most economists use the simpler form

$$\Delta \ln rc_j = \ldots \ldots \beta(\text{exposure}) + \text{controls} + u_j, \qquad (4')$$

where the term exposure is some empirical measure of the exposure of the household (or group of households) to the trade shock. For example, exposure may be the share of the households' output or the state's output that comes from tradable goods or their employment in export- or import-competing industries. In Equation 4′, defining the changes over an appropriate time period is also critical.

Estimating Equation 4′ is heavily dependent on data: Ideally one requires a panel whereby the same households can be observed over a period of trade liberalization. One country that has such data is Vietnam, and an early exercise covering the period 1993 to 1997/1998 is Niimi et al. (2007). A problem with this period is that, as opposed to a single step change in protection, there was a gradual and widespread liberalization that massively stimulated exports. Thus, exposure is defined in terms of the household's engagement with the export sector. Niimi et al. classify households into poor and nonpoor in each year and use a multinomial logit model to explain transitions from one state to another. Moving out of poverty is strongly associated with households' initial engagement in rice and coffee production and with the shares of their adult membership employed in one of four manufacturing export sectors. Coello et al. (2010) conduct a similar exercise on a post-2000 panel and obtain similar results in principle; they, however, find coffee production to have been a barrier to moving out of poverty because prices were much lower in the 2000s than in the 1990s.

McCaig (2011) analyzes the 2001 US-Vietnam Bilateral Trade Agreement (BTA), which granted Vietnam most-favored-nation status in the US market. This arrangement had the huge advantage for analysis that, unlike the cases of other bilateral trade agreements, the US tariff offer was predetermined and could not have been influenced by Vietnamese industries. Using variation in the structure of the labor force across provinces prior to the trade agreement, McCaig constructs provincial measures of exposure to US tariff cuts and finds that provinces that were more exposed experienced faster decreases in poverty between 2002 and 2004. He also shows that the movement of less skilled workers across provinces was limited and that for these workers (but not for highly skilled ones) the most exposed provinces experienced faster wage growth.

Brambilla et al. (2012) reinforce the advantages of being in the export sector when trade is liberalized. These authors consider the scenario opposite to that considered by McCaig (2011): the effects of US antidumping duties on Vietnamese catfish at the household level. They examine catfish-producing households in the Mekong delta between 2002 and 2004 and find that income growth was significantly slower among those initially more heavily involved in catfish farming. The authors find a relative decline in both catfish income and net revenues from other farm activities and observe that affected households found diversifying out of farming and fishing difficult.

Other important aspects of exporting and poverty include the presence of local markets to allow farmers to make the initial sale (see Balat et al. 2009 on Uganda) and the role that standards in the import country might play. Maertens & Swinnen (2009) and Maertens et al. (2011) explore the income and poverty effects of high sanitary standards, integrating company and household survey data from the vegetable export chain in Senegal. Exports grew strongly, despite increasing standards in Europe, and contributed importantly to rural incomes and poverty reduction. The mechanism was that raising standards induced a shift from smallholder contract farming to integrated estate production, switching poor households' income source from the product to the labor market.

The lessons of the previous paragraphs are that workers in exporting firms gain from trade liberalization and that labor immobility prevents the gains from being spread more widely. A much regarded study of the importer side is Topalova's (2010) study of the 1991 liberalization in

India. Imposed on India by the IMF, this liberalization is generally held to have been almost wholly immune to Indian political influence and may therefore be considered as relatively exogenous in its sectoral pattern. Topalova exploits variation in this pattern and in the sectoral composition of production across districts to construct a difference-in-differences estimate of the impacts of liberalization on consumption and on measured poverty in a sample of 77 urban regions and approximately 450 rural districts.[4] Specifically, her explanatory variables include the employment-weighted import tariff for each district, district fixed effects, and a fixed effect for the posttrade liberalization period. The first means that she is capturing only districts' exposure to import competition, with any specialization in exports broadly captured by district fixed effects. The last captures any overall effect of the liberalization on Indian consumption or poverty and so means that her coefficients on trade exposure capture only relative effects. Thus, it is hardly surprising that she finds that rural districts with more exposed production sectors experienced slower declines in poverty and lower consumption growth. No theory has ever suggested that import-competing sectors or regions will do relatively well out of a trade liberalization. Moreover, in earlier related work, Topalova (2007) finds, albeit in somewhat less technically secure estimates, that whereas import exposure increases poverty, export exposure over this period reduces it. Castilho et al. (2012) find a similar dichotomy between export- and import-oriented results in Brazil.

For all their elegance, Topalova's (2010) estimates do not take us much closer to answering the question of whether liberalization helped to reduce Indian poverty. From a policy perspective, however, they do emphasize the importance of labor mobility in response to trade shocks, a theme we return to below: She finds that the impact of liberalization was most pronounced among the least geographically mobile, at the bottom of the income distribution, and in Indian states where inflexible labor laws impeded factor reallocation across sectors.

Other researchers challenge Topalova's (2007, 2010) results. Hasan et al. (2007), updated by Cain et al. (2010), find that trade liberalization aids poverty reduction in a more aggregated (state-level) exercise on India, which also includes the liberalization of nontariff barriers. Krishna et al. (2010) also find that trade liberalization is associated with reduced poverty but that the effect is smaller in lagging states. This smaller effect appears to be due to the weaker transmission of international prices to domestic prices in lagging states, especially in the rural sector. Krishna et al. also suggest that South Asian countries with a smaller proportion of their populations in lagging regions experience a greater reduction in poverty following trade liberalization. Again, mobility—this time geographical—seems to be the key to the even distribution of the gains from trade. The state-level data used by these studies may allow for a more equal mixture of import and export effects so that the overall positive effect dominates.

WAGES AND LABOR MARKETS

The past decade has seen a boom in studies analyzing the effects of trade and trade policy on labor market outcomes, focusing in particular on the skill premium and wage inequality. Few studies address the poverty implications directly, but given that the poor are mostly unskilled, the effect of trade liberalization on the skill premium offers partial insight into its poverty effects. An increase in the skill premium may arise from an absolute decrease in unskilled workers' wages, which would be likely to have adverse effects on poverty. But even if unskilled wages fall, the link to poverty as usually measured at the household level will be confounded by the facts that many households

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[4]The Indian National Sample Survey data are repeated cross sections rather than panels, so Topalova (2007, 2010) has to create a pseudopanel at the district/region level.

survive by selling goods or services directly rather than by selling labor and that many households have multiple workers. Despite these challenges, it is worth considering this literature to illustrate the mechanisms through which the poor could lose from liberalization.[5]

Recent advances in the positive economics of international trade show how the stronger firms within a sector typically gain more from trade liberalization than do other firms. The new literature on income distribution recognizes that different firms may have different labor demands or may be better equipped to select better labor or to monitor job performance so that liberalization can change the composition of the sector's labor demand.[6] Such changes in composition can change relative wages or employment economy wide or, when combined with limited worker mobility between firms, can have strong distributional effects within sectors or even within firms. Following discussion of these possibilities, this section also considers the ways in which trade liberalization might impact labor market informality and gender differentials.

Trade and Wage Inequality

The traditional link between trade liberalization and inequality has been the Stolper-Samuelson theorem, which predicts that liberalization will increase the wages of unskilled labor in developing countries, which in turn will reduce wage inequality. As Winters et al. (2004) and Goldberg & Pavcnik (2007) note, however, the evidence has been unkind to the Stolper-Samuelson theorem, and many developing countries—e.g., Mexico, Colombia, Brazil, Argentina, India, and China—have seen rising skills premia and wage inequality at the same time that they have opened up their economies. Moreover, there is little evidence of labor reallocation from contracting sectors to expanding sectors, the key mechanism within the theorem.

Fukase (2013) argues that the Stolper-Samuelson theorem applies in Vietnam, however, and Goldberg & Pavcnik (2007) note that the skill premium may increase if low skill–intensive sectors are the beneficiaries of protection or if the model is modified to include a combination of countries with different degrees of unskilled-labor abundance. In that case, countries opening to trade with more unskilled-labor-abundant countries could experience an increase in the skill premium and in wage inequality (Davis 1996, Davis & Mishra 2007).

More recently, the literature on international trade has shifted its focus from countries and sectors to firms as the central unit of analysis. Models of heterogeneous firms show that (a) differences in firm characteristics have an important role in shaping the effect that trade has on the economy and that (b) firms are unevenly affected by trade liberalization. This new wave of theoretical models also provides a different setting for considering the distributional impact of trade policy. In particular, the observation that a large part of the effect of trade liberalization happens within sectors has led to a growing literature on intrasectoral changes in the wage distribution. These studies provide an alternative mechanism through which trade liberalization can influence inequality in developing countries.

One stream of research emphasizes changes in the relative returns to different worker characteristics and in the composition of labor demand as the main driver of wage variation across firms. Such research assumes competitive labor markets in which workers with the same characteristics receive the same wage but assumes that trade liberalization incentivizes tradable goods sectors to change the composition of their workforces. Verhoogen (2008) introduces quality

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[5]Harrison et al. (2011) discuss some of these models, but from a more theoretical perspective.

[6]Given our focus on extreme poverty, we restrict our attention to work on developing countries, but there is also interesting work on trade and labor markets in developed countries (e.g., Autor et al. 2013 and Moretti 2013).

upgrading into the heterogeneous firm model: More productive firms produce higher-quality goods for the export market, using a higher-quality workforce and paying higher wages. As in Melitz (2003), in Verhoogen's model, trade liberalization allows the stronger firms to expand in size and/or in number, which increases the relative demand for higher-quality labor. Verhoogen tests the theory by using Mexican plant-level data and the Mexican peso devaluation of 1994 as a proxy for trade liberalization, comparing the 1993–1997 peso devaluation period with the 1997–2001 placebo period. He finds that higher-productivity plants have a higher export share, pay higher wages, and have a higher ratio of white-collar workers to blue-collar workers and that these effects are stronger during the devaluation than during the placebo period. Thus, quality upgrading contributed to rising wage inequality within industries in Mexico. An important feature of the results, however, is that both more skilled and less skilled wages increase absolutely, which suggests benign poverty effects.

A similar mechanism is highlighted by Bustos (2011), who studies the impact of Mercosur on Argentinean firms. In her study, firms can choose between two production technologies that differ in terms of their skill intensity. In equilibrium, there are three types of firms: the skill-intensive exporters; the unskilled exporters; and the unskilled, domestically oriented firms. A tariff reduction in an export market induces more firms to enter and to upgrade to the skill-intensive technology and increases the market share of more productive firms. This increase generates higher demand for skilled workers and increases the skill premium. The least productive firms are forced to downgrade their skills. Using Argentinean firm data, Bustos finds that small firms downgraded skills whereas larger firms upgraded skills in response to Brazil's tariff reduction. The net effect on the share of skilled labor is positive and implies that one-third of the increase in the employment share of skilled labor in Argentina between 1992 and 1996 is explained by the reduction in Brazil's tariffs.

Frías et al. (2012) look at the effect of exporting on the within-plant wage distribution by using employer-employee data for Mexico and an identification strategy similar to that of Verhoogen (2008). Frías et al. find that exporting is associated with higher wages on average but that there is no evidence of an impact of exporting for low-paid workers (those at the tenth percentile of the intrafirm wage distribution), whereas the effect is significant and increasing for more highly paid employees. Thus, exporting increases the dispersion of within-plant wages but apparently does not deepen poverty.

A second line of research focuses on labor market frictions as the explanation for increasing wage inequality across firms, which ties up with the importance of factor immobility observed in the household results. Fair-wage models, efficiency-wage models, and search and matching friction models have been suggested as plausible frameworks. The main implication of these models is not only that the composition of the workforce can change differentially across firms following trade liberalization but also that workers with identical characteristics can be paid different wages, depending on the trading status of their employer. These differences occur because of the link between wages and firm revenues implied by the labor market assumptions.[7]

Helpman et al. (2010) develop a model of heterogeneous firms in which the labor market is characterized by search and matching frictions. In this framework, firms have an incentive to screen workers in order to select those with high abilities. More productive and larger firms screen more intensively and thus have a workforce with higher average ability and higher wages (because better workers are more difficult to replace). Trade liberalization, which expands the number of

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[7]Akerman et al. (2013) and Helpman et al. (2012) show that in Brazil and Sweden a large part of the overall wage inequality is explained by within–sector-occupation inequality and that the latter is mainly a residual wage inequality (after workers' observable characteristics are controlled for).

more productive firms in the export market, also increases their capacity to screen workers and to select those of higher ability. This process results in exporting firms improving the composition of their workforces and increasing their wage premia relative to nonexporting firms. The main implication is that trade liberalization increases wage inequality. A second implication of the model is that the relationship between wage inequality and trade costs first increases and then decreases. This pattern results from the fact that the share of exporting firms drives wage inequality in this model: At the two extremes of 0%-exporting firms and 100%-exporting firms, wage inequality is unchanged.[8]

Helpman et al. (2012) test the above model by using matched employer-employee Brazilian data between 1986 and 1995. Helpman et al. identify four main features that are consistent with the theory. First, most of the wage inequality is due to within–sector-occupation wage inequality; second, residual wage inequality accounts for a large part of total wage inequality; third, between-firm wage dispersion accounts for a large part of the growth of within–sector-occupation wage inequality; and fourth, larger firms and exporters pay higher wages on average. Helpman et al. estimate the parameters of the models and run counterfactual exercises to assess the impact of lowering trade costs on wage inequality. The estimates show that opening a closed economy to trade (a massive shock) raises wage inequality by approximately 10%.

Krishna et al. (2011) also affirm the importance of labor market matching mechanisms in a study of the composition of the workforce of exporting firms. These authors hypothesize that firms change the composition of their workforce systematically in terms of workers' innate ability and/or firm-worker match, factors that are unobservable from the data. In this case, analysis looking only at average firm-level wages may be biased. The higher wages apparently paid by exporters may then be attributed to these exporters having a better workforce in terms of unobservables. Krishna et al. show that, once one controls for the endogeneity of the worker-firm matching through the inclusion of worker-firm match effects, there is no significant effect of lower tariffs on wages in either domestic-oriented firms or exporting firms.

Amiti & Davis (2011) extend the heterogeneous firm model to separate trade in final and intermediate goods. Crucially, they also adopt a fair-wage model of wage determination that ties wages to firm performance. The model predicts that lower tariffs on final goods increase wages at exporting firms while reducing wages in domestically oriented firms. Lowering input tariffs, in contrast, raises wages at importing firms but reduces wages at firms that do not import any inputs. By using Indonesian firm data for the 1991–2000 period of trade liberalization, the empirical exercise confirms the model's prediction, showing that a 10-percentage-point reduction in output tariffs increases wages by up to 3% in exporting firms but reduces wages by 3% in domestically oriented firms. A 10-percentage-point reduction in input tariffs increases wages by up to 12% in importing firms but has an insignificant effect on firms that do not import. The lower wages in domestically oriented firms may worsen poverty if, as seems likely, these are also the unskilled labor–intensive firms.

Whereas the above studies suggest that trade liberalization increases wage inequality, Amiti & Cameron (2012) reach a different conclusion for Indonesia. They look at the impact of trade liberalization on within-firm wage skill premia, distinguishing between reductions in input tariffs and reductions in output tariffs. They show that reducing input tariffs actually reduces the wage skill premium, whereas there is no significant effect of reducing tariffs on final goods. These results arise because in Indonesia intermediate-input production has higher skill intensity than final-goods

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[8]Liu (2013) finds evidence of the nonmonotonic relationship between wage inequality and trade for the United States. Residual wage inequality first increases with openness and then decreases, with a turning point estimated at a ratio of export to domestic sales of 0.3. However, to the best of our knowledge, there is no direct evidence of this nonmonotonic relationship for any developing country.

production does. Amiti & Cameron's explanation for this finding is that, whereas previous studies focus on middle-income countries with relatively lower concentrations of unskilled labor, Indonesia is one among the most unskilled-labor-abundant countries.

Another important issue is the potential intersectoral reallocation of workers following trade liberalization, which can also have important welfare implications. Davis & Harrigan (2011) insert efficiency wages into a heterogeneous-firm model. In this setting, firms are heterogeneous not only in their productivity level but also in their capacity to monitor workers' effort. The model shows that, although the aggregate effect on employment is small, there is a lot of turnover in the labor market, and in particular so-called good jobs, the ones with above average preliberalization wages, form an important share of the jobs lost. This is because, conditional on a given productivity, firms that exit the market (and so destroy jobs) are the ones that are less efficient in monitoring and thus have to pay higher wages to elicit effort. In their simulation exercise, Davis & Harrigan find that trade brings substantial aggregate gains and that aggregate unemployment is barely affected. However, there is a large amount of churning in the labor market, and one-fourth of all good jobs are destroyed.

Menezes-Filho & Muendler (2011) analyze workers' displacement following trade liberalization in Brazil. These authors find that tariff cuts do generate worker displacements but that exporters fail to absorb these workers. This finding implies that, following trade liberalization, successful firms expand their output, but not their workforces. Lower product tariffs actually increase the rate of transition out of the manufacturing sector and into either unemployment or exit from the labor force. However, lower intermediate-input tariffs have the opposite effect.

The results surveyed in this section certainly suggest that trade liberalization may increase wage inequality and, via that mechanism, income inequality. The results generally do not suggest, however, that this outcome is associated with increases in absolute poverty. Rather, in the small number of countries for which the exercises are possible, less skilled workers (who are more likely to be from poor households) seem to gain from trade liberalization, although they gain proportionately less than more skilled ones do.

Trade and the Informal Labor Market

Another labor market channel through which trade is said to affect poverty is informality. Goldberg & Pavcnik (2007) survey a few studies and find mixed results. We take up their thread. First, however, we note that poor and informal are far from identical sets, especially in Latin America, where most of the evidence comes from.

Aleman-Castilla (2006) uses a heterogeneous-firm model similar to Melitz's (2003). In this model, the firm can choose whether to be in the informal sector or in the formal sector. The model offers ambiguous predictions about the impact of trade liberalization on the employment share of the informal sector but, unlike Goldberg & Pavcnik (2003), includes the possibility that trade liberalization reduces the share of informal workers. On the one hand, trade liberalization, which reduces trade costs, increases real wages in the industry and thus reduces entry into formality and so increases the informality rate. On the other hand, less productive informal firms are forced to exit the market, whereas the more productive formal firms export and expand, which tends to increase the share of formal workers. Estimating the relative strengths of these two forces on Mexican data, Aleman-Castilla shows that lower import tariffs significantly reduce the probability of informal employment.

Paz (2014) adds endogenous payroll tax compliance to the heterogeneous-firm model. With Brazilian data, he finds that lower import tariffs reduce the average formal wage but have an ambiguous effect on the share of informal workers. The reduction in trading partners' import tariffs, in contrast, increases the average formal wage, decreases the share of informal workers, and has an ambiguous effect on the average informal wage.

Bosch et al. (2012) find that trade liberalization had almost no impact on the share of informal workers in Brazil but that new labor regulation, which increased firing costs, increased the share significantly. Similarly, Menezes-Filho & Muendler (2011) find that lower product tariffs increased the probability of being forced out of the formal sector and into unemployment, but these authors find no evidence of increased transition into the informal sector.

Viollaz (2013) analyzes the link between tariff reductions and informality in Argentina between 1980 and 2001. She finds that trade liberalization increased the probability of working in the informal sector in the short run but that the magnitude of the effect depended on the average firm size operating in the industry. When small and medium firms prevailed, the impact was higher and significant, but when large firms prevailed, the impact became insignificant. In the long run, however, the effect was reversed in manufacturing industries, with informality decreasing after tariff reductions, although it still tended to increase in the nontradable sector.

These results are very limited geographically. However, they suggest that the evidence that trade liberalization increases informality has, if anything, become weaker over time.

The Effects of Trade Liberalization on Gender

A potentially important aspect of poverty is the gender gap.[9] Female-headed houses are often among the poorer ones, and within households, higher wages for females may improve their standing in intrahousehold decision making. A number of recent papers study the effects of trade liberalization on female wages, a potentially important determinant of household poverty status. These studies identify three main channels: intersectoral reallocations, intrasectoral reallocations, and discrimination.

First, if trade liberalization favors female-intensive sectors, female wages or employment will increase. Aguayo-Tellez et al. (2010) look at the impact of tariff reductions caused by the NAFTA on gender outcomes in Mexico. They decompose the change in the female share in employment and the wage bill into the between- and within-industry components. Between 1990 and 2000, women's share of the wage bill increased by 5.3 percentage points, 40% of which was accounted for by between-industry shifts caused by tariff changes favoring initially female-intensive industries. The within-industry changes are discussed below.

Gaddis & Pieters (2012) analyze the effect of trade liberalization on women's labor outcomes in Brazil. They use the variation in state-level measures of trade exposure to identify causal effects of trade liberalization on female labor outcomes. They find that states with greater exposure to trade liberalization experience faster increases in female labor force participation and employment. The increase in the female share of total employment is driven mainly by the expansion of the service sector, which is more female labor intensive. These authors also provide evidence, however, that the increase in female labor market participation and employment may be caused by increased male unemployment and job insecurity.

Second, trade can affect the within-sector gender composition. As noted above, trade liberalization stimulates more productive firms and higher-quality products. This process frequently entails skilled and cognitive tasks replacing unskilled and manual tasks and may also involve technological upgrading, which in turn may affect gender labor market outcomes if women have a comparative advantage in less physically intensive and more highly skilled activities. Juhn et al. (2012) build a model in which firms choose between old and new technologies requiring different

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[9]Papyrakis et al. (2012) provide a longer survey, but the surveyed studies predate the more recent contribution of the heterogeneous-firm literature applied to analyze gender dynamics.

amounts of white- and blue-collar inputs. Both tasks can be performed by male or female workers, but Juhn et al. (2012) hypothesize that new technologies replace physically demanding tasks with computerized production, making women more productive in blue-collar jobs. Trade liberalization induces more firms to enter foreign markets and to upgrade their technology in this way. Juhn et al. (2013) test this model and find that tariff reductions induced the entry of new firms into the export sector; that the newly exporting firms upgraded their technology, particularly with new computerized equipment; and that the tariff reduction increased the ratio of female to male blue-collar workers as well as the relative wages of female blue-collar workers. Consistently with their model, Juhn et al. (2013) find no effect in white-collar occupations.

Peri & Poole (2013) explore whether changes in task composition in response to offshoring affect gender outcomes in Brazil. Although they confirm that increased openness is associated with higher demand for skilled labor, in particular associated with cognitive tasks, they do not find any effect on the share of female employment.

The third link is the reduction in gender discrimination, which is predicted to fall as competition increases (Becker 1971). Trade liberalization may clearly operate via this margin. Ederington et al. (2010) use plant-level data to analyze the impact of Colombia trade liberalization on the share of female workers employed in Colombian plants. These authors find that establishments experiencing a greater decline in tariff protection increased their share of female employees. The effect is not due to discriminating firms exiting from the market but is due to plants hiring more women.

Menon & Rodgers (2009) test the discrimination hypothesis at the industry level in India and find that increasing trade openness is associated with growing wage gaps between men and women in manufacturing. They attribute this result to the behavior of sectors not exposed to domestic competition (concentrated sectors). Following the reductions in rents caused by the trade liberalization, these firms try to cut costs at the expense of workers with less bargaining power—typically women. Similarly, but less directly, Edmonds et al. (2010) argue that households in the Indian districts that Topalova (2010) identifies as losing tariff protection cut education expenditure to save money and that the burden fell disproportionately on girls.

Maertens & Swinnen (2012) look at the gender impact of the expansion of modern supply chains on the export of high-value agricultural goods in Senegal. They find that modern supply chains, although gender discriminating in several aspects, have a lower gender wage gap than other employment sectors do and can thus contribute to the reduction in gender wage inequality in rural labor markets.

Overall, the reviewed studies show mixed results concerning the gender impact of trade liberalization. However, we believe that there is sufficient recent evidence to conclude provisionally that interindustry shifts may be a potentially favorable channel for improved female labor outcomes following trade liberalization.

CONCLUSION

A decade ago, Winters et al. (2004) concluded that there is no simple general conclusion about the relationship between trade liberalization and poverty. This conclusion still pertains, but we have learned more about the process since then. The literature of the past decade reinforces the presumption that trade liberalization generally raises average incomes (i.e., boosts economic growth temporarily), and shows that the response to trade liberalization is likely to vary with a series of complementary conditions, many of which refer to the ease with which factors of production can migrate between sectors. The latter feature raises the as-yet-unproven possibility that the beneficial effect of trade liberalization does not extend to the poorest countries. Exploring this possibility is a priority for future research.

The recent literature also reaffirms that the static and microeconomic effects of trade liberalization cannot be guaranteed to be benign. Because trade liberalization changes relative prices, it almost inevitably reduces the welfare of some people, some of whom may be poor: The precise effects of trade liberalization will depend especially on the nature of the trade reforms that are actually undertaken and on how the poor make their living. The consumption of the poor is more heavily weighted toward food than is the consumption of the more affluent and so is more at risk if agricultural trade is reformed or if food prices spike. In the longer run, however, the general equilibrium effects on incomes tend to offset at least a good share of these vulnerabilities. More important is the fact that the differences between the rich and poor are even greater in the ways that they earn their living than in consumption so that the differential effects on income tend to dominate in the overall effects of trade reform; this reality is most obvious in Porto (2006).

One stream of research showing considerable advance in recent years is that exploring how trade liberalization may increase wage inequality. Recent advances in trade theory at a firm level suggest that liberalization may be more unequalizing between skilled and unskilled workers than previously thought. Such advances thus raise the possibility of adverse poverty effects, but these effects are far from inevitable, because increasing inequality is quite consistent with even the lowest of wages rising to some extent (as Verhoogen 2008 suggests), and besides, households may have several sources of income. This literature hints that women may gain relatively more from trade liberalization.

A recurring theme in the recent literature is that factor, and especially labor, mobility is key to reaping the gains from trade and sharing them reasonably equally. This theme is evident from several macroeconomic studies and from several household studies that show that, absent reasonable mobility, working in an export sector or firm is good news and working in an import-competing sector or firm is bad news. This finding is hardly surprising, but commentators do not always fully appreciate that one cannot necessarily infer the general malignity of trade liberalization from observing the pain of import-competing workers. Fostering mobility is a policy margin that deserves a good deal more attention.

DISCLOSURE STATEMENT

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