Labor Market Responses to Tariffs: Frictions, Dynamics, and Policy Responses

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Abstract

This article introduces the evidence and associated modeling frameworks contemporary economists use to understand the effects of trade and trade policy on labor markets, with a particular emphasis on labor-market frictions and adjustment dynamics. The effects of trade shocks differ across industries, regions, and occupations, implying the presence of important adjustment frictions in labor markets, and these effects evolve slowly over time, implying the need for dynamic frameworks rationalizing slow transitions. After reviewing the key insights from this literature, we discuss policies aimed at mitigating costs to workers and ensuring that the gains from trade are shared more equitably.

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In recent decades, many countries around the world have seen a backlash against international trade, reflected in rising anti-globalization political sentiment, shifts in voting behavior, and substantial increases in protectionist policies (Goldberg and Reed, 2023). Colantone et al. (2022) survey the evidence on the drivers of this backlash and identify trade-induced inequality across social groups and regions as the central force driving these changes. These gradual shifts became acute in 2025, when the Trump administration began implementing a broad increase in US import tariffs. The administration justified its tariff policies with a wide range of rationales, including reducing trade deficits, countering allegedly unfair trade practices, addressing national security concerns, and generating tariff revenue. But perhaps its most prominent rationale was the claim that import competition—particularly from China—harms US workers by reducing their earnings and employment.

In response to this concern, this article provides an introduction to the evidence and modeling frameworks contemporary economists use to understand the effects of trade policy and import competition on labor markets. We start by discussing some of the classic workhorse models of trade, which rely on stark assumptions about the mobility of workers and capital. One class of these models assumes factors are perfectly mobile across sectors and regions, an approach typically used to characterize long-run outcomes. In this spirit, we briefly review a result that many readers will find familiar: the Stolper-Samuelson theorem in the context of the Heckscher-Ohlin model, which focuses on the long run by assuming perfectly mobile factors of production. At the other extreme are frameworks in which one or more factors of production are completely immobile, an assumption commonly employed to study short-run impacts. In particular, we discuss the specific-factors model, in which some factors can only be used in a single industry. As we will discuss, this model provides a central building block for the empirical literature studying the effects of national trade policy changes on local labor markets.

Neither extreme, however, captures the gradual and uneven adjustment processes that shape labor-market outcomes over time. Central concerns of policymakers and the public lie precisely in this intermediate horizon. Even if trade liberalization generates substantial gains in the long run, how quickly are these gains realized? Which workers, regions, sectors, and occupations bear the losses during the transition? How do institutional features such as labor-market regulations and their enforcement shape these outcomes? And what role do trade imbalances play in the adjustment process to trade shocks?

Over the past 15 years, a large and influential literature in international trade and labor economics has studied these questions from both empirical and theoretical perspectives. We begin by discussing recent empirical studies that credibly identify the causal labor-market effects of trade shocks. A central finding is that trade liberalization and import competition can generate sizable and highly localized labor-market disruptions. Specifically, employment and earnings losses tend to be concentrated in particular regions, sectors, and occupations, and adjustment is often slow, with effects extending beyond directly affected workers to entire local communities. We then turn to recent evidence on the labor-market consequences of increased tariff protection and examine whether it delivers the employment gains often claimed by its proponents.

The findings from this empirical literature have, in turn, motivated the development of quantitative trade and labor-market models that incorporate these adjustment patterns and are better suited to informing policymakers about the speed of adjustment, which workers lose during the transition, and the policies that can mitigate losses. In particular, the literature has increasingly moved from static to dynamic frameworks emphasizing mobility frictions across regions, sectors, and occupations, worker heterogeneity, and labor-market regulations.

The insights emerging from this recent literature have important policy implications. In an environment of rising skepticism toward globalization, governments pursuing a pro-trade agenda face the challenge of designing complementary policies that mitigate adjustment costs and support adversely affected workers and regions. Thus, we conclude by discussing policies aimed at smoothing worker transitions and compensating those who lose as a result of trade policy changes.

1 Long-Run Effects in a Frictionless World

If one asks an undergraduate economics student to predict the effect of changes in trade policy on factor prices, they are likely to cite the Stolper-Samuelson (1941) theorem in the context of the canonical two-industry and two-factor Heckscher-Ohlin model (throughout, we use "factor" and "input" interchangeably). The theorem predicts an increase in the real returns to the factor used intensively in producing the good whose relative price increased, while the other factor's real returns decrease, irrespective of the industry employing those factors. To be more specific, consider an economy with two products, A and B, with prices P_A and P_B. Both goods are produced by perfectly competitive, profit-maximizing firms using factors X and Y, whose prices are w_X and w_Y. We assume that both factors are perfectly mobile across industries and that product A is intensive in the use of factor X, implying that product B is relatively intensive in the use of factor Y.[1] Let hats represent proportional changes, such that $\widehat{x} \equiv dx/x$. If the change in trade policy leads to product price changes such that $\widehat{P}_B > \widehat{P}_A$, the Stolper-Samuelson result is that $\widehat{w}_Y > \widehat{P}_B > \widehat{P}_A > \widehat{w}_X$. In other words, the price of the intensive factor in the favorably affected industry increases relative to both prices, while the price of the other factor falls relative to both prices, a result Jones (1965) described as "magnification." Samuelson (1987) recalls experiencing "excited surprise" upon discovering this result in part because it differed from partial equilibrium

[1] Further assume that both production functions are linearly homogenous, twice differentiable, strictly quasi-concave, and have strictly positive marginal products.

models, in which output price changes tend to drive changes of smaller magnitude in their associated factor prices.

Despite the Stolper-Samuelson theorem's appeal, its applicability has limits. It yields sharp predictions in a two-by-two model, but when generalizing to more realistic settings with multiple products and factors, it often leads to indeterminacies or requires unintuitive technological restrictions to recover sharp predictions in empirically relevant contexts (see Deardorff (1994) and its associated volume). For example, the commonly-cited "friends-and-enemies" formulation states that, irrespective of the number of products and factors, a change in the price of one product will raise the real return to some factor and reduce the real return to some other factor (Ethier, 1974; Kemp and Wan, 1976; Jones and Scheinkman, 1977). While an intuitive generalization, this result is of limited practical use because it does not specify which factors will win and lose when a price change occurs nor does it provide information on how other factors will be affected.

The two-by-two model's predictions are also seemingly contradicted by salient empirical examples. For example, many developing countries that substantially reduced trade barriers between the late 1970s and the early 1990s experienced subsequent increases in inequality (Goldberg and Pavcnik, 2007). With skilled and unskilled labor as inputs, and assuming that developing countries are relatively abundant in unskilled labor, the Stolper-Samuelson theorem predicts the opposite, an increase in the relative wage of locally abundant unskilled workers and an ensuing reduction in inequality. This apparent contradiction motivated researchers to explore alternative mechanisms linking trade and inequality, as discussed in detail in Dix-Carneiro and Kovak (2025).

The theorem also applies only to a world without frictions, in which all factors of production are able to costlessly transition between sectors. While this feature might be relevant in the long run, in the short run many factors face costs when switching industries, including the cost of redeploying a machine in a different factory or allowing a worker to accumulate skills specific to a new industry. Moreover, in the frictionless setting, a worker or capital owner's industry is irrelevant to their preferences over trade policies; all workers should oppose a tariff on the capital-intensive good irrespective of their current industry of employment. Yet, in reality, workers and owners often align in their lobbying efforts for protection of their industry, without regard to factor intensities (Magee, 1980; Beaulieu, 2002; Mayda and Rodrik, 2005). Even Stolper and Samuelson (1941) acknowledge "Nobody, of course, ever denied that the workers employed in the particular industry which loses a tariff could be hurt in the short-run...." These observations led researchers to consider alternative frameworks incorporating factor-mobility frictions.

2 Short-Run Effects and Industry-Specific Factors

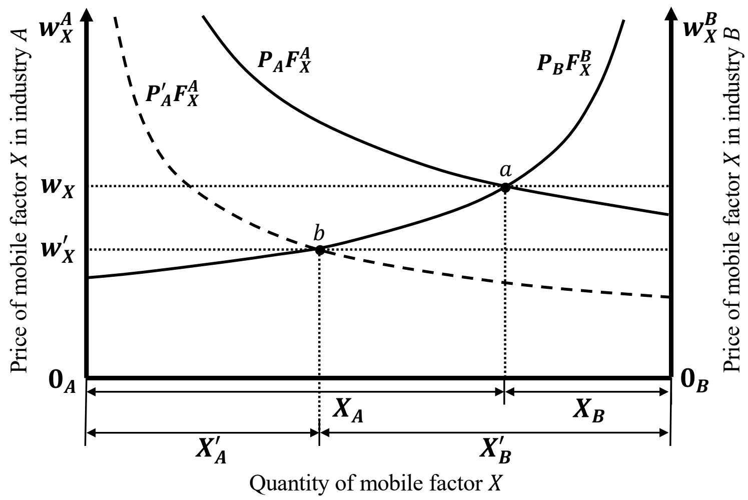
The simplest and most extreme version of mobility frictions assumes that all factors are entirely industry specific, i.e. that they cannot switch industries at all. In a very short-run model where all factors are industry specific, the implications of trade-policy induced price changes are trivial; with competitive factor markets and perfectly inelastic factor supply, a change in the price of a given product results in a proportional change in the price of its associated factors. While such a model might be relevant when inputs are highly specialized or in the very short run, the literature has focused on a model allowing for some factor mobility, in which each industry has a single industry-specific factor and all industries share a common mobile factor. This setup is known as the Ricardo-Viner or specific-factors model.

Consider an economy identical to the one discussed in Section 1 except that the production of product A uses a mobile factor X and an industry-specific factor Y_A, while production of B uses X and an industry-specific factor Y_B. While Y_A and Y_B are used exclusively in their respective industries, X is freely mobile, so its factor payment is equalized across industries. We can visualize the equilibrium using the diagram in Figure 1, which first appeared in Mussa (1974). The length of the horizontal axis represents the amount of the mobile factor, X. The left vertical axis plots the price of X in industry A, w_X^A, while the right vertical axis plots the same for industry B, w_X^B. The share of X employed in industry A increases as one moves to the right from 0_A. The solid curves labeled $P_A F_X^A$ and $P_B F_X^B$ are the price times marginal product of X in the relevant industry, which are decreasing in the amount of X employed in the industry since the quantity of each specific factor is fixed. Because factor markets are competitive and X is freely mobile between industries, the values of marginal product are equal across industries and equal to the price of X. Since the length of the x-axis reflects the total quantity of X in the economy, the intersection of the two value of marginal product curves at point a determines the factor price w_X and the allocation of X across the two industries, X_A and X_B.

Given this setup, imagine that the country implements a tariff cut that reduces the price of product A to $P'_A < P_A$. This change shifts the value of marginal product in industry A downward, leading to a new equilibrium at point b, with a reduction in the price of X to $w'_X < w_X$ and a reallocation of the mobile factor away from industry A and toward B. How does this change affect the real returns to each factor? For the mobile factor, the answer depends upon the preferences of its owners. Because w_X fell in nominal terms, its purchasing power falls for product B, whose price was unchanged. However, the decline in w_X is smaller than the reduction in P_A. This implies an increase in purchasing power in terms of product A, so the net effect of the price change depends on X owners' preferences for A vs. B.

Payments to the industry-specific factors can be seen on the figure as the area below the associ-

Figure 1: Specific-Factors Diagram



This figure visualizes equilibrium in the specific-factors model. The length of the horizontal axis represents the amount of the mobile factor, X. The left vertical axis plots the price of X in industry A, w_X^A, while the right vertical axis plots the same for industry B, w_X^B. The solid curves labeled $P_A F_X^A$ and $P_B F_X^B$ are the price times marginal product of X in the relevant industry. Point a represents the initial equilibrium, with mobile factor price w_X and mobile factor allocation X_A and X_B. Point b represents the equilibrium after a reduction in the price of product A from P_A to P'_A, with mobile factor price w'_X and mobile factor allocation X'_A and X'_B.

ated value of marginal product curve and above the mobile factor price.[2] The decline in P_A clearly increases payments to Y_B and also reduces payments to Y_A, because w_X falls less than P_A. This immediately implies an increase in the real return to Y_B and a decline in Y_A's purchasing power in terms of B. Y_A's purchasing power also falls in terms of A; the reduction in X_A implies a decline in F_Y^A, since X and Y are complements, and therefore w_Y^A falls relative to P_A, since $w_Y^A = P_A F_Y^A$. Hence, the real return to industry-A specific factor falls. To summarize these findings in a situation where $\widehat{P}_B > \widehat{P}_A$, the specific-factors model implies that $\widehat{w}_Y^B > \widehat{P}_B > \widehat{w}_X > \widehat{P}_A > \widehat{w}_Y^A$. In other words, the specific factor in the industry experiencing a relative price increase gains, the other specific factor loses, and the effect on the mobile factor is ambiguous, depending on its owners' preferences. Consistent with the friends-and-enemies generalization, the specific factors experience magnification effects similar to the Stolper-Samuelson theorem in general equilibrium, while the mobile factor experiences an effect like in a partial equilibrium model (Jones, 1971).

When labor is the mobile factor and capital the specific factor, workers and owners will in some cases agree to support protection for their current industry. Capital owners in the industry will

[2]Consider the payment to industry-A specific factor in the initial equilibrium at point a. Total revenue in industry A is the area under the value of marginal product curve, $P_A F_X^A$, since integrating the marginal product yields total output. The total payments to the mobile factor in industry A are $w_X X_A$, corresponding to the rectangular area below and to the left of point a. With perfect competition and zero profits, total payments to Y_A are total revenue minus payments to the mobile factor, i.e. the area below $P_A F_X^A$ and above w_X.

benefit unambiguously, and workers will also benefit if their consumption is weighted toward the other industry. This pattern is in sharp contrast with the Stolper-Samuelson theorem, in which the interests of capital and labor will always be in conflict, since any product price change will help one factor and harm the other. Mayer (1974) and Mussa (1974) interpret the specific-factors model as reflecting the short run and the Heckscher-Ohlin model as the long run, emphasizing the differences in each factor's support for or opposition to protection in the short vs. long run. Note, however, that despite the presence of winners and losers, both the Heckscher-Ohlin and specific-factors models imply that trade generates aggregate gains at the country level—that is, trade increases the overall size of the economic pie in all trading partners. In principle, because the aggregate gains exceed the losses, the winners from trade could compensate the losers while still remaining better off themselves, so that everyone would be weakly better off relative to a situation with less trade openness. We return to this idea in Section 6, where we discuss policies aimed at smoothing the adjustment costs associated with trade liberalization.

Along with the benefit of allowing analysts to consider effects in the short run or in contexts where productive inputs are inherently industry-specific, as with some machinery and natural resources, the specific-factors model also admits a straightforward generalization to many industries, each of which is assumed to have an industry-specific factor and to share a common mobile factor (Jones, 1975). This model avoids the indeterminacies of the more general Heckscher-Ohlin model and largely maintains the results just worked out in the two-industry case. In this many-industry specific-factors model, the mobile factor's price change is a weighted average of price changes across industries, where industries employing a larger share of the mobile factor receive greater weight. In the following section, we show how studies of the effects of trade on local labor markets have capitalized on the specific-factors model's ability to generalize to settings with many industries, facilitating empirical analysis using fine-grained industry data.

3 Static Effects of Trade on Local Labor Markets

As detailed data on product-level trade flows and worker-level labor market outcomes became more widely available in the 1990s, researchers began exploring new dimensions of trade policy's potential effects on labor markets. Many papers studied the effects of changes in trade policy or other measures of import competition on wages at the industry level, motivated by the idea that labor is industry-specific, at least in the short run, and therefore tied to the prospects of the employing industry. Prominent early examples include Revenga (1992) on the US, Revenga (1997) on Mexico, and Attanasio et al. (2004) and Goldberg and Pavcnik (2005) on Colombia, all of which find significant relative reductions in industry wage premia when facing larger reductions in trade protection, as predicted if labor is partly industry specific. This cross-industry approach raises an important interpretation issue: it can only identify *relative* effects between industries facing different changes in trade protection, not *aggregate* consequences. For example, the papers just mentioned are consistent with the interpretation that trade liberalization raised (lowered) wages across the board, but did so less (more) in industries facing larger tariff cuts (see Dix-Carneiro and Kovak (2025) Section 3.1.3 for a detailed discussion).

Because industries tend to be concentrated in particular locations within countries and workers face costs of moving geographically, these industry-level effects of changes in *national* trade policy may lead to different effects across *local* labor markets. In a pair of seminal papers, Topalova (2007; 2010) studied the effects of Indian trade liberalization on regional poverty through the lens of a two-industry specific-factors model, in which labor is industry specific and immobile across locations. Her approach related changes in regional poverty rates to an employment-weighted average of tariff changes, placing more weight on industries employing a larger share of regional labor. In this framework, regions face different local tariff shocks due to differences in industry mix across locations and differences in tariff changes across industries. Both papers find that Indian regions whose industries faced larger tariff cuts experienced slower reductions in poverty than other regions.

Topalova's insight of combining trade policy variation across industries with regional variation in industry mix using a weighted average has proven particularly influential in the subsequent two decades because of its intuitive appeal and empirical relevance to observed regional outcomes. Kovak (2013) develops a theoretical foundation for this empirical approach using a specific-factors model of regional economies, clarifying how to construct measures of regional labor-market exposure to trade liberalization and interpret the associated empirical results. In this setup each region is a multi-industry specific-factors economy extending Jones (1975), in which labor is treated as mobile across industries and each location is endowed with a vector of industry-specific factors.[3] Examples of these regional industry-specific factors include natural resource inputs such as mineral deposits, land suitable for particular agricultural products, or industry-specific machinery. In the short run, both types of inputs are assumed to be immobile across regions. Because labor is assumed to be freely mobile across industries within region, wages are determined at the regional level, and one can derive a model-consistent estimating equation relating local wage changes to changes in tariffs across industries:

$$\Delta \ln w_r = \theta_0 + \theta_1 RTR_r + \varepsilon_r, \tag{1}$$

$$\text{where } RTR_r \equiv -\sum_{i \in T} \beta_{ri} \Delta \ln(1+\tau_i) \qquad \text{and } \beta_{ri} \equiv \frac{\lambda_{ri}\frac{1}{\eta_i}}{\sum_{j \in T} \lambda_{rj}\frac{1}{\eta_j}}. \tag{2}$$

[3] Kovak (2013) additionally assumes that there are no trade costs across regions, so goods' prices are spatially equalized, that the liberalizing country is small, so domestic prices fall proportionately with one plus the tariff rate, and that nontradable goods' prices are determined in local equilibrium.

In words, the change in the log wage in region r, $\Delta \ln w_r$, relates to a weighted average of tariff changes across tradable industries $i \in T$, which we refer to as the regional tariff reduction, or RTR_r. The weights, β_{ri}, depend primarily upon the share of regional employment in each industry, λ_{ri}, but also upon the cost share of specific-factors in industry i, η_i (though in practice the latter term generally has little quantitative impact). As in any specific-factors model, when labor is the mobile factor, the effect of a given set of tariff changes on the real wage within a given region is ambiguous. Moreover, as in any difference-in-differences style regression, equation (1) compares outcome growth for units facing larger vs. smaller shocks but cannot identify absolute effects on either group. Instead, equation (1) shows that the *relative* effect across regions is driven by a simple weighted average of tariff changes. This inability to identify aggregate effects in this type of cross-sectional regression parallels the same limitation in the earlier cross-industry analyses.

To provide intuition for the weighted-average structure of equation (1), Figure 2 presents a graphical analysis in a context with two locations (regions $r = 1, 2$) and two industries ($i = A, B$). Each region is modeled as a specific-factors economy, as in Figure 1, and both regions face the same goods' prices. In Panel (a), labor L_r is mobile across industries within region r, and industry-specific factors T_{ri} are immobile across both locations and industries. We assume that region 1 has a larger endowment of industry-A specific factor relative to industry-B than does region 2, i.e. $T_{1A}/T_{1B} > T_{2A}/T_{2B}$. This difference in specific-factor endowments leads to differences in the marginal products of labor across regions such that, in equilibrium, the share of regional labor allocated to industry A is larger in region 1 than in region 2, as shown on the x-axes at the initial equilibrium points a and c.[4]

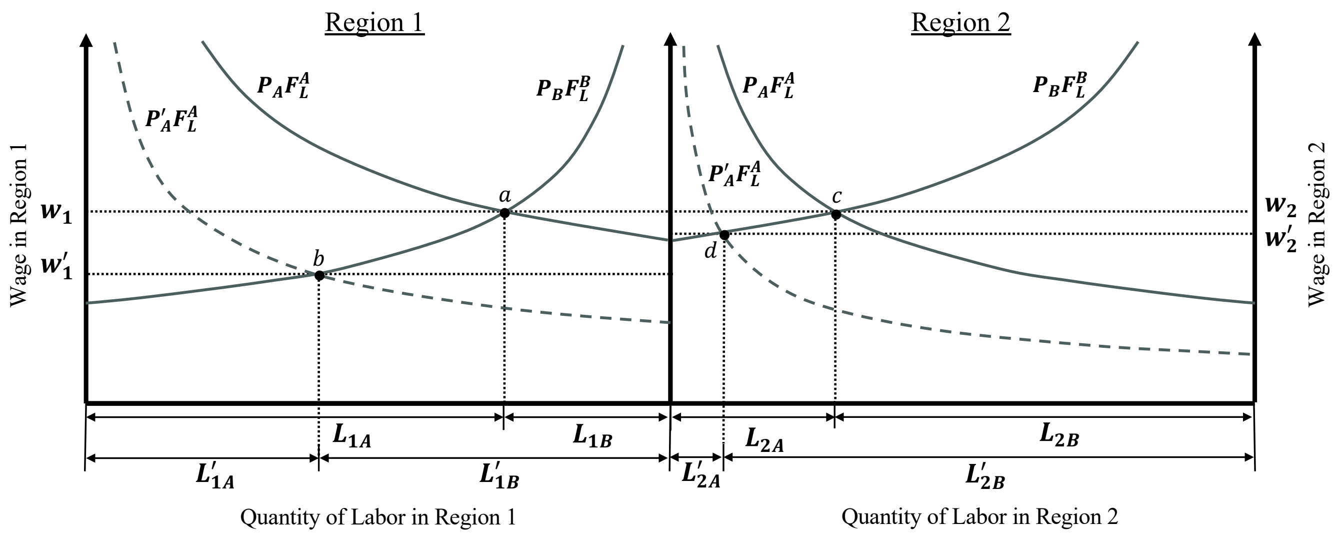
Starting from this initial equilibrium, assume the domestic price of good A falls due to a tariff reduction, lowering the value of marginal product for industry A in both regions. To restore regional equilibrium, workers shift out of industry A and into industry B until the values of marginal product (and thus wages) are equalized across the two industries. The magnitude of the resulting equilibrium wage decline will be greater when industry A is larger or if its labor demand is more elastic, because both of these features imply that a larger quantity of labor must leave the industry to drive a given decrease in the marginal product of labor. This reasoning explains the structure of the weights in equation (2): larger industries have larger λ_{ri}, and with a Cobb-Douglas production function, the industry-specific labor demand elasticity is $1/\eta_i$. Therefore, in the resulting equilibrium, region 1's wage falls more than region 2's. Similarly, a change in P_B would have a larger effect on the wage in region 2 than in region 1, consistent with the weighted-average structure in (1).

Kovak (2013) implements the regional research design in (1) in the context of Brazil's trade liberalization of the early 1990s, which involved large average tariff cuts and substantial variation

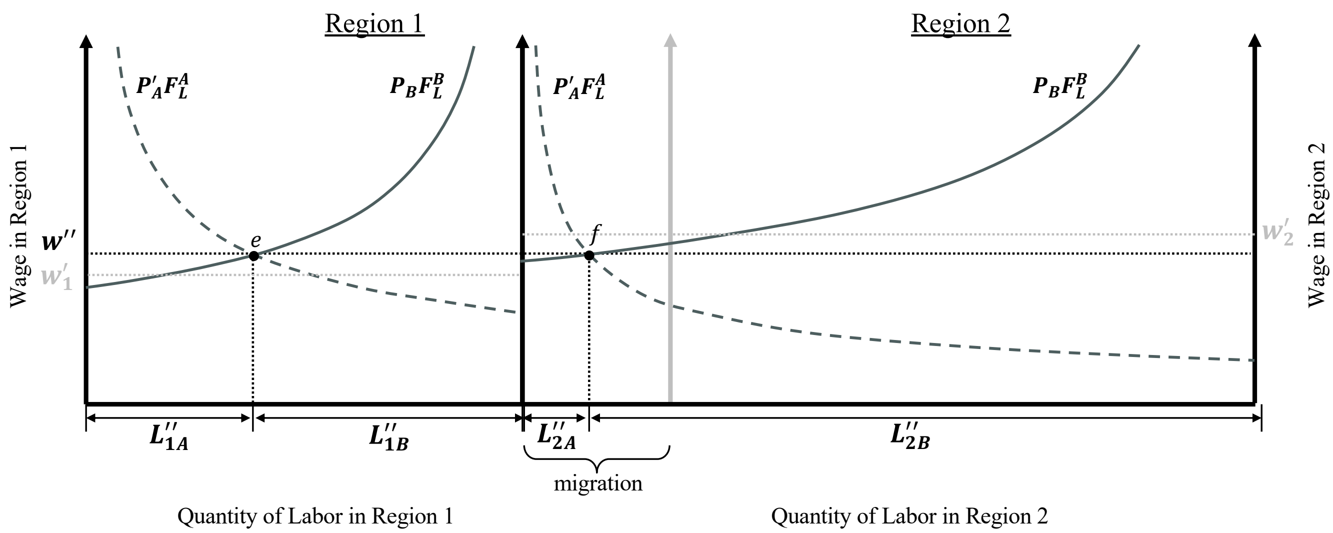
[4]For visual clarity, the figure was generated assuming wages are initially equalized between the two regions, but this assumption is not necessary for any of the conclusions drawn here.

Figure 2: Specific-Factors Model of Local Labor Markets

Panel (a): Without inter-regional migration



Panel (b): With costless inter-regional migration



In Panel (a) each region is a specific-factors economy as in Figure 1, where labor L is the mobile factor. Production is Cobb-Douglas, with specific-factor cost share $\eta_i = 0.5$ in both industries, $L_r = 10$ in both regions, $T_{1A} = 1$, $T_{1B} = 0.4$, $T_{2A} = 0.4$, and $T_{2B} = 1$. Initially, $P_A = P_B = 1$, and after the price change, $P_A = 0.5$. Panel (a) shows the effect of the price reduction in changing wages w in each region. Panel (b) shows the effect of costless inter-regional migration in equalizing wages across locations. For visual clarity, the figure was generated assuming wages are initially equalized between the two regions, but this assumption is not necessary for any of the conclusions drawn here.

in cuts across industries. The empirical findings confirm that regional wages fall more (grow less) from 1991 to 2000 in regions facing larger tariff reductions. While this model predicts that $\theta_1 = -1$ in the absence of inter-regional migration, the empirical estimates are approximately -0.4. This difference suggests the presence of some amount of equalizing migration or random measurement error in the regional shock estimates. Nonetheless, as in Topalova (2007; 2010), the fact that such large regional effects remain 9 years after the start of the liberalization episode implies the presence of important migration frictions across locations. In the following section, we place this effect estimate in the context of its evolution over time to learn more about the dynamic adjustment process.

While Topalova (2007; 2010) and Kovak (2013) examine countries lowering the barriers they impose on *imports*, McCaig (2011) studies the effects of lower barriers to *exports* in a dominant export destination. Specifically, he studies the effects of the US-Vietnam Bilateral Trade Agreement on local labor markets in Vietnam, finding larger poverty reductions in Vietnamese regions specialized in industries facing larger reductions in US tariffs, consistent with the notion that Vietnamese export goods facing larger US tariff declines experienced larger increases in relative prices. In a follow-up paper, McCaig and Pavcnik (2018) show that Vietnamese industries facing larger US tariff reductions experienced shifts into formal employment and increased productivity. In the context of the Canada-US Free Trade Agreement, Kovak and Morrow (2025) study the effects of tariff reductions on both imports and exports, finding adverse effects of Canadian tariff cuts and favorable effects of US tariff cuts for Canadian workers.

The literature on trade policy's effects on labor market outcomes has exploded in recent years, and a full literature review is beyond the scope of this paper, but a few additional threads are worth highlighting.[5] Workers may face frictions in switching industries and locations, meaning that industry-level and region-level shocks may be relevant for their outcomes. Hakobyan and McLaren (2016) examine the effect of NAFTA on US workers' wages, including terms capturing both an average regional shock, similar to equation (2), and a direct industry-level shock. They find quantitatively and statistically significant effects in both dimensions, suggesting that Mexican import competition was relevant to US workers' wages based both on their location and industry of employment. More recently, Pierce et al. (2024) use a similar approach to study the regional and industry effects of Chinese import competition in the US, finding that regional effects were more important than industry effects.

While not studying a trade policy change per se, a prominent literature beginning with Autor et al. (2013) studies the local effects of increased imports from China in the US, using a weighted-average measure similar to equation (2). They instrument for observed US imports from China

[5] In Dix-Carneiro and Kovak (2025), we provide a broader summary of the effects of globalization on inequality, including outcomes beyond the labor market, with a focus on Latin America.

using other countries' Chinese imports and find substantial and persistent relative reductions in manufacturing employment in regions facing larger growth in Chinese imports. This influential work has spawned many extensions and replications in other countries; see Autor et al. (2016) and Autor et al. (2025) for thorough literature reviews. A complementary approach to studying the effects of Chinese import competition focuses on reductions in trade policy uncertainty associated with the US granting China Permanent Normal Trade Relations in 2001 (Handley and Limão, 2017). While this change did not affect realized protection, it reduced the risk that the US Congress would raise tariffs on China, and that reduction in risk varied substantially across industries. Pierce and Schott (2016) show that US manufacturing industries facing larger reductions in tariff uncertainty experienced larger employment declines, and in Pierce and Schott (2020) they use a regional weighted-average approach similar to (2) to document relative increases in unemployment rates and reductions in labor force participation in more exposed regions.

Most of the empirical literature discussed so far examines the effects of tariff reductions or increases in import competition, which induce relative declines in labor demand across regions or industries. A natural question is whether the effects are symmetric when tariffs rise and trade protection increases. Evidence from the 2018-2019 US-China trade war is beginning to shed light on this issue. Flaaen and Pierce (2024) show that, in the short run, industries receiving greater tariff protection experienced modest increases in employment, all else equal. However, these gains were offset by higher costs on imported intermediate inputs and by retaliatory tariffs imposed by China on US exports. On net, industries more exposed to tariff increases experienced relative declines in employment.

Autor et al. (2024) examine a longer time horizon following the trade war. They find that industries benefiting from tariff protection experienced increases in sales, but not in employment. Instead, higher sales reflected firms' ability to raise prices and expand their capital stock. This evidence suggests that firms protected by tariffs responded both by exploiting reduced competitive pressure and by making production more capital intensive through automation and capital deepening. At the regional level, the authors find no statistically significant positive effects of tariff increases on employment. In contrast, retaliatory tariffs imposed by China generated relative employment declines in locations more exposed to these retaliatory measures, at least in the short run.

These findings offer three important lessons for the current debate over rising protectionism, particularly in large high-income economies. First, governments must be careful not to offset the intended benefits of tariff protection by raising the cost of imported intermediate inputs. Second, when a large country imposes tariffs on another large trading partner, retaliatory measures may substantially erode or even eliminate any employment gains from protection. Third, protecting industries may benefit firm owners without necessarily benefiting workers. Increased sales may reflect higher markups due to reduced competition and greater capital intensity in production, rather than higher labor demand.

Together, the industry- and region-level empirical approaches discussed in this section reveal a rich picture of the effects of trade policy on labor market outcomes, demonstrating the importance of labor market frictions even at decadal time scales. Yet, all of the models and evidence discussed so far are inherently static, comparing outcomes in a single period before and a single period after a trade policy change. In the following section, we consider dynamic labor market responses to trade policy, highlighting recent evidence that in many cases went against conventional wisdom and required a rethinking of the simplest models.

4 Tariffs and Labor Market Dynamics: Empirics

A clear lesson from the static local-labor-market literature is that effects of tariff changes on local outcomes tend to be far more persistent than economists had initially expected. As just discussed, Topalova (2010) and Kovak (2013) document local impacts on poverty and wages that last for more than a decade, and Autor et al. (2013) find similarly durable effects of import competition from China on US unemployment and labor force participation. These findings were surprising at the time: the prevailing view was that inter-regional migration would be strong enough to dissipate the effects of local labor-demand shocks on real wages and unemployment within a few years. That view was widespread in light of Blanchard and Katz (1992), who showed that US state-level unemployment and real wages tend to return to baseline over a roughly 5–7 year horizon, primarily through population outflows.

Given this background, Dix-Carneiro and Kovak (2017) fill an important gap in the literature by placing the snapshot provided by Kovak (2013) in the context of the long-run adjustment path. They document how regional employment and wages evolved year by year following liberalization, estimating dynamic responses of local labor-market outcomes to region-specific tariff declines:

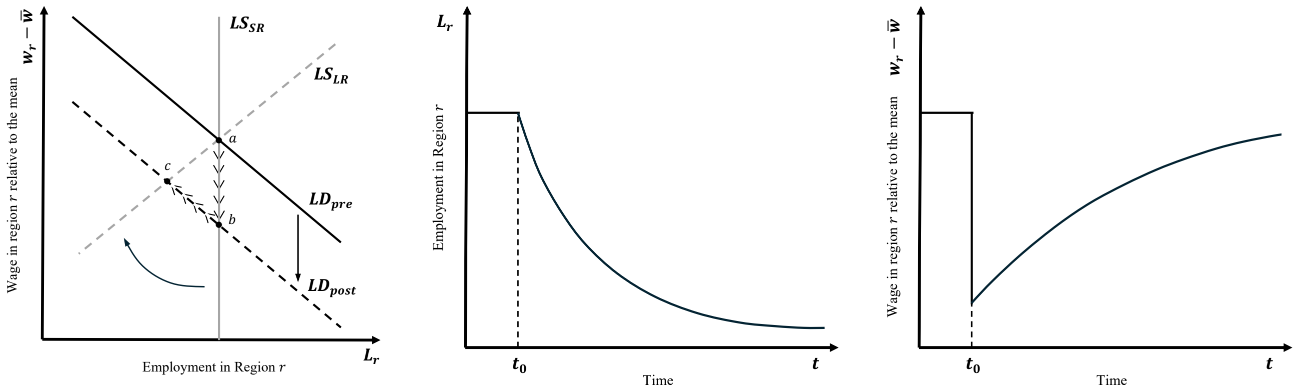
$$y_{r,t} - y_{r,0} = \theta_t RTR_r + \alpha_t + \epsilon_{r,t}, \tag{3}$$

where the left-hand side is the change in region r's outcome y between period 0 (just before liberalization) and period t, α_t is a year fixed effect, and $\epsilon_{r,t}$ is a residual term. Importantly, the local effect of liberalization, θ_t, is allowed to vary freely over time. Because Brazil's liberalization was effectively a one-time shock concentrated between 1990 and 1995, the trajectory of θ_t directly traces short-, medium-, and long-run regional impacts of the fixed tariff shock captured by RTR_r.

In standard spatial models, a permanent decline in local labor demand—e.g. induced by price declines faced by regional producers—leads to an immediate decline in wages, since workers are

Figure 3: Simple Model of Dynamic Labor Market Adjustment

(a) Shock response (b) Employment Adjustment (c) Wage Adjustment



Panel (a) shows the initial labor market equilibrium at point a, at the intersection of the pre-shock labor demand curve, LD_{pre} and the short-run labor supply curve LS_{SR}. After the negative tariff-induced labor demand shock, the labor demand curve moves down to LD_{post}, and the equilibrium moves to point b in the short run. Then, as workers migrate out of the negatively affected location, the labor supply curve gradually rotates clockwise to become the long-run labor supply curve, LS_{LR}. Panel (b) shows the predicted time path of regional employment, L_r, and panel (c) shows the time path of the regional wage relative to the cross-regional average, $w_r - \overline{w}$.

approximately immobile across regions in the short run and labor supply is effectively inelastic. As already shown in Panel (a) of Figure 2, when a change in trade policy reduces the relative price of a region's most important products, it drives a wage gap between the more affected and less affected locations, with the magnitude of the gap reflecting the size of the labor demand shock. Panel (a) of Figure 3 illustrates the same effect in a standard supply-and-demand framework as the equilibrium moves from point a to point b in the short run.

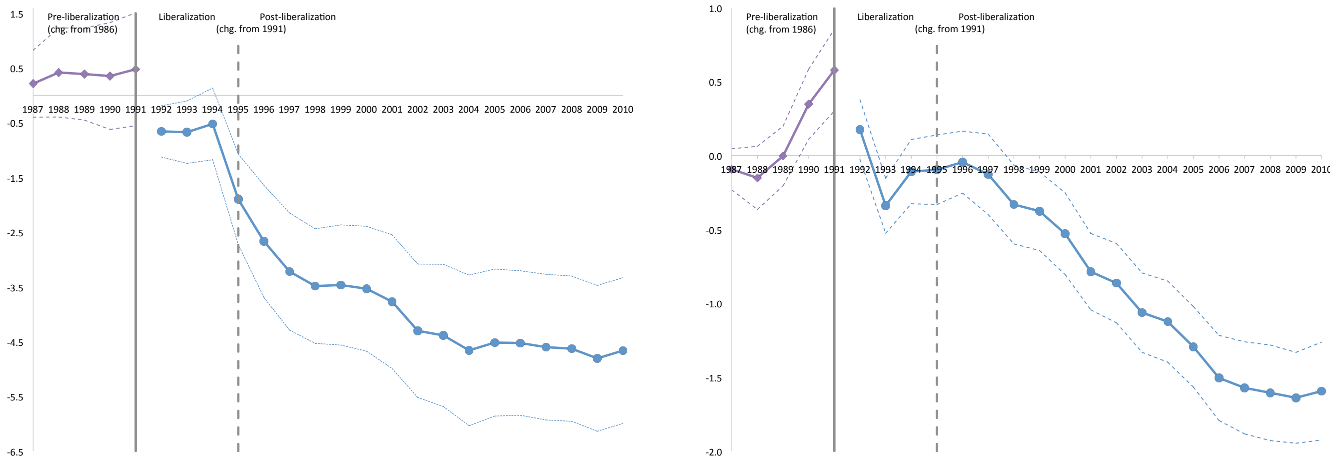
The wage gap gives workers an incentive to move away from the negatively affected region to the rest of the country. In Figure 2, when a worker moves from region 1 to region 2, the x-axis shrinks by one unit in region 1 and grows by one unit in region 2, shifting the middle y-axis to the left along with the value of marginal product curves measured with respect to that axis ($P_B F_L^B$ in region 1 and $P_A F_L^A$ in region 2). As this migration progresses, the middle axis shifts further left, the equilibrium wage in region 1 rises, and the wage in region 2 falls. In the extreme case of perfect inter-regional mobility in the long run, this process continues until wages are equalized across locations, as shown in Panel (b) of Figure 2.

The same migration process appears in Figure 3 Panel (a) as a clockwise rotation of the labor supply curve; as workers gradually move away from the negatively affected region, labor supply becomes more elastic, and the equilibrium point slowly moves along the labor demand curve from b to c. Panel (b) shows the gradual but permanent decline in employment in the negatively affected region. When labor demand falls in the adversely affected region, wages drop on impact, but as workers gradually move away, wages partially recover. Whether wage gaps persist in the long

Figure 4: Formal Employment and Earnings Dynamics—Dix-Carneiro and Kovak (2017)

(a) Formal Employment

(b) Earnings



Notes: Each point reflects an individual regression coefficient, θ_t, following (3). Panel (a) replicates Figure 4 and Panel (b) replicates Figure 3 of Dix-Carneiro and Kovak (2017).

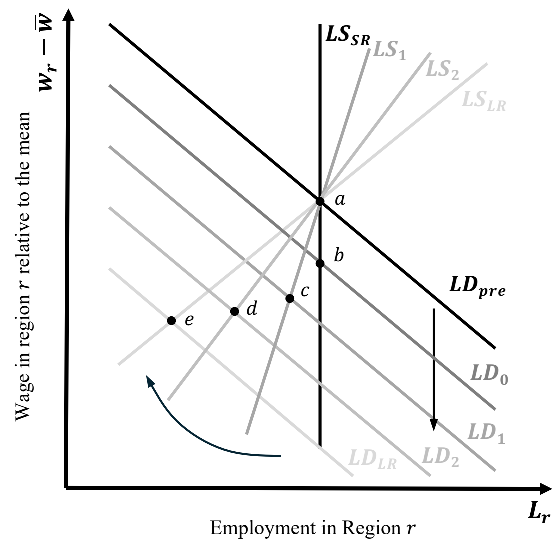
run depends on the long-run labor supply elasticity—that is, on whether workers are perfectly or imperfectly mobile across regions in the long run. Panel (c) shows the resulting wage path: short-run effects are more negative, while long-run impacts are smaller in magnitude.

Dix-Carneiro and Kovak (2017) show that the response of Brazilian regional formal employment closely follows the predictions of this simple spatial model. Panel (a) of Figure 4 plots the evolution of θ_t when equation (3) is estimated using the log of formal employment as the outcome y. Regions more exposed to tariff-induced import competition experience gradual relative declines in formal employment, with effects stabilizing roughly 15 years after the start of the liberalization episode. In sharp contrast, the behavior of log wages diverges markedly from the model's predictions. Rather than converging as workers migrate to equalize earnings across regions, the negative relative wage impacts deepen over time and stabilize only 17 to 20 years after liberalization begins, as shown in Panel (b) of Figure 4.[6]

Two main mechanisms explain this behavior. First, capital adjusts slowly across regions. As capital flows out of regions more exposed to import competition, the initial drop in labor demand is gradually amplified: a shrinking capital stock lowers the marginal product of labor and pushes labor demand further down over time. Labor demand therefore falls on impact and keeps falling as capital relocates toward higher-return regions. Second, agglomeration economies further magnify these shocks; as employment declines, so does productivity, reinforcing the reduction in local labor demand. Together, these channels imply that labor-demand dynamics gradually amplify the

[6]Note that due to a lack of hours information in most administrative data sources, including in Brazil, research in this area rarely distinguishes between monthly earnings and hourly wages.

Figure 5: Simple Model of Dynamic Labor Market Adjustment with Dynamics in Labor Demand



As in Figure 3, the y-axis measures the regional wage relative to the cross-regional average, $w_r - \overline{w}$, and the x-axis measures regional employment, L_r. The initial labor market equilibrium is at point a. After the negative tariff-induced labor demand shock, the labor demand curve falls to LD_0 and the equilibrium point moves straight downward to point b. As capital reallocates away from the region and lost agglomeration externalities further reduce productivity, local labor demand falls over time to LD_1, LD_2, and LD_{LR}. At the same time, workers slowly migrate away, rotating the labor supply curve from LS_{SR} to LS_1, LS_2, and LS_{LR}. The equilibrium then moves through points c, d, and e.

initial effects of the liberalization shock, and wage impacts remain persistent because workers are imperfectly mobile across regions (i.e. long-run labor supply is not perfectly elastic).

These mechanisms are illustrated in Figure 5. Following trade liberalization, labor demand in a region more exposed to tariff cuts falls on impact, shifting the equilibrium from point a to point b. Because short-run labor supply is inelastic, wages drop immediately. Over time, two forces unfold: (a) capital in the affected region depreciates and new investment flows elsewhere, pushing labor demand further down; and (b) workers gradually move out, rotating the labor supply curve clockwise. As these adjustments play out, the equilibrium shifts from point b to points c, d, and e. In this example, long-run wage effects exceed short-run effects, and employment losses are also amplified relative to those in Figure 3. Moreover, as labor flows out, it reduces local productivity—given the presence of agglomeration economies—which further reinforces the decline in labor demand caused by capital adjustment. The qualitative path for wages depends on which adjustment is faster: the downward shift in labor demand or the clockwise rotation of labor supply.

The main takeaways from Dix-Carneiro and Kovak (2017) are that tariff-induced shocks generate meaningful regional dynamics and long adjustment paths. In Brazil's case, the economy required 17 to 20 years to fully adjust to the liberalization episode. Their findings also underscore frictions in workers' geographic mobility and show that agglomeration forces and the spatial reallocation of capital are central to understanding the observed adjustment process.[7]

In a follow-up paper, Dix-Carneiro and Kovak (2019) investigate how the same tariff-induced local shocks affected individual workers, focusing on the margins along which workers adjusted. Using administrative panel data, they show that workers initially employed in regions more exposed to import competition experienced formal-sector employment declines that grew over time. These workers were able to shift toward formal non-traded activities—especially low-paying jobs—but this adjustment margin was more than offset by larger losses in traded sectors. Using decennial census data, the authors further document that more exposed regions saw increases in non-employment in the medium run (1991-2000). In the long run (1991-2010) employment recovered, but largely through the expansion of informal work, which is widely viewed as lower-quality (Perry et al., 2007). Taken together, these patterns indicate substantial disruption in local labor markets: firms exit in the short and medium run and new entry is limited, leaving displaced formal-sector workers unemployed for extended periods. Over time, however, local employment rebounds as workers shift into the informal sector, which appears to function as a buffer for trade-displaced workers. In its absence, the effects of negative labor-demand shocks on unemployment would likely have been larger and longer lasting—a hypothesis corroborated by Ponczek and Ulyssea (2022) and supported by the structural framework in Dix-Carneiro et al. (2026).

5 Tariffs and Labor Market Dynamics: Theoretical and Quantitative Insights

These empirical results, documenting complex, dynamic labor market responses to trade policy changes have motivated the development of trade models incorporating salient features of labor markets, including search frictions and unemployment; worker mobility frictions across sectors, regions, and occupations; labor market regulations and informality; and transitional dynamics. These features allow the models to capture nuanced and realistic distributional impacts of trade policy, replicating key empirical patterns and allowing researchers to quantify the aggregate and distributional effects of trade along the entire transition path.

From Static to Dynamic: Introducing Mobility Frictions and Transitional Dynamics Traditional models of trade capture either short-run effects (as in the specific factors model) or long-run outcomes (as in Heckscher-Ohlin or Ricardian models), but they offer no guidance on what happens during the transition—precisely the period over which policymakers worry most about the costs of trade liberalization. In particular, these models say little about the magnitude of

[7] We encourage researchers to examine similar dynamics in other contexts with one-time trade policy shocks to assess the extent to which the results from Brazil generalize to other contexts.

the costs workers face as they adjust, how long the adjustment will take, or the lifetime impacts on workers across regions and industries once mobility frictions and transitional dynamics are taken into account. They also cannot speak to anticipatory effects of policies announced in advance. These are core questions in contemporary debates over trade policy, yet they simply cannot be addressed within static frameworks. The first generation of structural labor–trade models—including the framework of Artuç et al. (2010)—filled this gap by introducing forward-looking workers and costly mobility across industries.

These dynamic models generate slow and gradual adjustment to trade shocks, as forward-looking workers face idiosyncratic and time-varying mobility costs. This structure generates aggregate adjustment paths that capture underlying mechanisms in which workers delay moving because better opportunities arise at different times; many are initially reluctant to relocate; uncertainty about future prospects resolves only gradually; and workers in declining sectors often lack the skills needed elsewhere. Together, these forces explain why labor reallocation is slow even when long-run gains from trade are positive, and they help us characterize the dynamic gains from trade: labor-market frictions delay the realization of benefits from comparative advantage and specialization, lowering the present value of those gains.

From Representative Worker to Rich Heterogeneity Still, these models do not allow for differences in adjustment across workers: in practice, some individuals move quickly while others barely adjust, but the framework discussed above treats them as responding in the same way. This is a key concern for policymakers who want to identify which groups are more vulnerable to changes in trade policy and to design effective policies that compensate those who lose, thereby sustaining support for globalization. These distributional concerns—together with the evidence that adjustment varies widely across workers, sectors, occupations, and regions—motivated researchers to incorporate richer forms of worker heterogeneity.

Young and old workers, skilled and unskilled workers, and individuals with different occupational profiles respond very differently to trade-induced shifts in labor demand across sectors. Incorporating this heterogeneity—through overlapping generations, worker comparative advantage across sectors (observed or unobserved), or sector-specific experience—substantially changes both the quantification and the interpretation of mobility frictions. Dix-Carneiro (2014) shows that once selection and sorting of workers across sectors are taken into account, many workers face far more modest sectoral mobility costs than those estimated using the methodology of Artuç et al. (2010), which assumed workers are identical. Moreover, because older workers tend to be less flexible while new entrants are more mobile, part of the aggregate sluggishness reflects generational turnover: the economy adjusts gradually as less adaptable cohorts retire and more adaptable cohorts enter. These differences in mobility frictions mean that tariff changes generate distributional consequences not only across sectors—as in the specific-factors model or Artuç et al. (2010)—but also within sectors, among workers with different abilities to adjust.

In addition, Traiberman (2019) finds that adjustment can be slow in response to sectoral demand shocks not because changing *sectors* is particularly difficult, but because switching *occupations* is the main hurdle—and occupational composition varies systematically across sectors. This perspective underscores that workers' ability to adjust depends heavily on their initial tasks and their task-specific human capital. Because all of these frameworks embed worker heterogeneity directly, they can also be used to simulate compensation policies for the groups hurt by trade, including spillovers onto workers who do not receive support.

From Partial to Full General Equilibrium with Labor Market Frictions The frameworks discussed so far are all partial-equilibrium in nature. They are built on small open-economy models in which changes in a country's trade policy do not affect world prices or global supply and demand. This prevents them from capturing how trade policy changes affect world prices, global patterns of specialization, and the resulting gains from trade, while also limiting the counterfactuals they can analyze. For instance, these models cannot simulate how China's productivity growth reshaped global production and labor markets.

To move beyond these limitations, a third step in the literature—initiated by Caliendo et al. (2019)—embeds labor-market frictions into multi-country general-equilibrium models of trade built on the workhorse frameworks of Eaton and Kortum (2002) and Caliendo and Parro (2015). These Ricardian, multi-sector environments incorporate labor market dynamics and provide a unified framework for studying the gains from trade and its distributional effects when adjustment frictions matter, also accounting for how shocks in one country propagate to others. Moreover, they are able to estimate aggregate effects of changes in trade policy, overcoming an important limitation of the reduced-form approaches discussed above.[8]

Another key advantage of these general-equilibrium settings is that they describe full adjustment paths, not just steady states. This makes it possible to evaluate policies such as tariffs or study the effects of technological change in environments where reallocation is gradual and varies across regions and sectors. As a result, structural models of trade are now better aligned with the questions policymakers increasingly care about: not only how much trade affects welfare, but when, where, and for whom those effects arise.

How Macro Conditions and Institutions Shape Adjustment These frameworks are also flexible enough to analyze how macroeconomic conditions and labor market institutions shape

[8] A key motivation of Caliendo et al. (2019) is to develop a general equilibrium model that rationalizes the relative, reduced-form effects documented by Autor et al. (2013) and to use this framework to infer the aggregate welfare and labor-market effects of the China shock in the United States.

the labor-market consequences of trade shocks. A central example is relaxing the balanced-trade assumption, which is common in traditional trade models. Under balanced trade, import shocks must be accompanied by simultaneous export expansions, allowing workers to move from import-competing sectors into growing exporting industries. But when import competition coincides with rising trade deficits, this mechanism breaks down. The economy absorbs the import shock without a corresponding export boom, making unemployment effects larger and more persistent than what balanced-trade models suggest—unless services or other less tradable sectors expand enough to absorb workers displaced by import competition.

Dix-Carneiro et al. (2023) examine the importance of trade imbalances for the adjustment process by developing a quantitative general-equilibrium model of trade with frictional labor markets and aggregate saving and borrowing decisions that generate trade imbalances. This structure allows the model to capture episodes like China's "saving glut," in which shifts in foreign saving behavior drive persistent global imbalances independently of productivity or changes in trade costs. A key insight from this and related work is that allowing trade imbalances to adjust in response to import shocks substantially changes the dynamics of labor-market adjustment and unemployment. This work implies a significantly stronger role for developments in the Chinese economy in explaining the decline in US manufacturing employment than balanced-trade models do because rising trade deficits amplify the reallocation of labor toward services and other less tradable sectors.

In a similar spirit, other models introduce institutional frictions such as downward wage rigidity to generate unemployment responses to negative shocks (Rodriguez-Clare et al., forthcoming). Related work, building on the evidence in Dix-Carneiro and Kovak (2017), incorporates forward-looking capital accumulation and shows that slow capital adjustment interacts with labor mobility frictions, prolonging the local scarring effects of trade and delaying convergence (Kleinman et al., 2023).

A complementary line of research examines how institutional features—especially labor market regulations and the prevalence of informality—shape adjustment in developing economies. In environments where regulations are imperfectly enforced, firms choose between operating formally or informally, and this choice interacts with trade shocks in economically meaningful ways (Dix-Carneiro et al., 2026). Because more productive firms tend to operate formally while smaller and less productive firms remain informal, trade reforms reallocate resources across activities that face very different regulatory burdens. The central insight from this approach is that the gains from trade depend not only on comparative advantage, but also on how tariff changes shift activity between formal and informal production. When trade liberalization expands the more productive, but more heavily distorted, formal sector, overall gains from trade can be substantially larger than in otherwise similar economies without informality.[9]

[9] This showcases the distinction between relative and aggregate effects. In general equilibrium, Dix-Carneiro et

Kambourov (2009) and Ruggieri (2022) also show that stringent labor market regulations such as firing costs and minimum wages can significantly delay adjustment following trade liberalization. Restrictive labor institutions slow the reallocation of workers across sectors after a trade reform, muting the subsequent gains in output, productivity, and welfare. The overarching message is that trade reforms are most effective when paired with labor-market reforms that facilitate reallocation.

Summary Taken together, the newly-developed structural frameworks give us a much richer view of how labor markets adjust to trade shocks. Dynamic models make it possible to study transitions, including how long adjustment to trade policy is likely to take and who will bear the costs. Introducing worker heterogeneity reveals differences in mobility across workers, sectors, occupations, and regions, and allows for a more detailed characterization of distributional consequences of trade policy shifts. Embedding these ideas in multi-country general equilibrium demonstrates how shocks in one country transmit to others and more accurately quantifies the gains from trade when labor-market frictions and slow adjustment matter. These advances have made quantitative models of trade and labor markets more realistic and therefore more useful for policymakers evaluating past trade reforms and forecasting the labor-market consequences of future policy changes. Reflecting this progress, government agencies increasingly rely on these frameworks to evaluate not only past reforms but also prospective policies such as tariff changes.[10]

6 Smoothing Policies

Given the extensive evidence that trade shocks generate significant disruptions in labor markets, a natural question arises: How can governments mitigate the costs to workers and ensure that the gains from trade are shared more equitably? A voluminous body of literature studies the effects of active labor-market policies targeting the broader population of displaced or searching workers, but there is much less evidence on policies specifically designed to compensate workers in occupations or sectors exposed to foreign competition.[11]

al. (2026) show that trade liberalization shifts activity toward the *formal* sector in the aggregate, while in partial equilibrium Dix-Carneiro and Kovak (2019) find that regions facing larger tariff reductions experience relative growth (or smaller contractions) in the *informal* sector. These results are reconciled if trade liberalization reduces aggregate informality, but regions more exposed to import competition experience slower declines in informal employment.

[10]For example, in papers prepared for the US International Trade Commission, Riker (2022, 2024) adapt models from Caliendo et al. (2019) and Dix-Carneiro et al. (2023) to examine the effects of productivity growth in China's Plastics and Rubber Products industry and of proposed labor provisions in trade agreements designed to strengthen workers' bargaining power. Likewise, in a paper prepared for the Brazilian Secretariat for Strategic Affairs, Góes et al. (2019) use the framework of Caliendo et al. (2019) to assess a proposed tariff liberalization in Brazil, while World Bank (2025) employ the same framework to study the effects of trade liberalization and labor-market reforms in South Asia.

[11]For surveys of the broader literature on the effects of active labor market policies, see Crépon and van den Berg (2016), Card et al. (2018), and Bown and Freund (2019). These papers tend to find wide variation in the measured

Before discussing policy options, it is important to understand three central arguments for instituting programs specifically targeting workers negatively affected by changes in trade policy. First, consistent with our discussion in Sections 1 and 2, freer trade generally increases aggregate welfare while still leaving some groups of workers worse off. In this case, only by providing compensation to workers who lose from freer trade can it become Pareto improving, making all agents in the economy weakly better off. Second, compensating those who lose from trade is essential for the successful and durable implementation of pro-trade policies. Since the benefits of trade are often diffuse and the costs concentrated, political opposition to a liberal trade regime is likely to arise absent compensation (Magee, 2003). For example, Kim and Pelc (2021) find that US counties in which workers receive approval for trade-related support from the Trade Adjustment Assistance (TAA) program exhibit reduced demands for protectionism in comparison to other counties facing similar import competition. Third, the demand for trade-displaced workers' occupational experience and skills may fall throughout the labor market as a result of trade liberalization such that they struggle to find reemployment even more than the average unemployed worker. If so, targeted support and training programs may be particularly helpful to trade-displaced workers in gaining new skills and transitioning into growing occupations.

These arguments motivated the creation of the TAA program, which operated in its modern form from 1974 to 2022 and was the largest program explicitly compensating workers who experienced job loss due to import competition or offshoring.[12] The program provided a variety of benefits to trade-displaced workers, with the most important provisions being extended unemployment insurance payments and subsidized job training. These benefits were designed both to compensate workers for their trade-induced job loss and to help them train for employment in another sector or occupation. Hyman (2018) studies the effects of TAA using the quasi-random assignment of eligibility petitions to examiners with different baseline probabilities of approving or denying eligibility. TAA substantially increases earnings and employment for eligible workers, who are more likely to switch industries and to move to stronger labor markets. These results are encouraging, as they imply that with sufficiently generous benefits, trade-displaced workers' outcomes can be substantially improved in a cost-effective manner.

While the main provisions of the TAA program subsidize trade-displaced workers while unemployed and in training, from 2002 onward the program included an alternative benefit known as "wage insurance," which provided an employment subsidy incentivizing speedy reemployment.

effectiveness of worker-support policies including job training, public or private employment subsidies, and job-search assistance.

[12]While the program stopped considering new eligibility petitions on July 1, 2022, workers previously deemed eligible were able to continue receiving benefits after that date, consistent with their eligibility upon receiving certification. Note also that from 2002, onward, TAA covered workers indirectly affected by imports or offshoring, in industries upstream or downstream from directly affected industries.

Specifically, if a trade-displaced worker quickly found reemployment at a lower wage than in their pre-displacement job, they could receive a subsidy covering up to half of the gap between their old and new wages for up to two years (subject to caps on cumulative benefit payments and on reemployment earnings). In theory, by making lower-paying jobs more attractive, this subsidy structure should shorten costly unemployment spells but could also lead to poor job matches. Hyman et al. (2024) take advantage of the fact that the subsidy was available only to workers age 50 or over to identify its effects using a regression-discontinuity design, finding that the program reduced unemployment durations without meaningfully lowering wages or changing other job characteristics. It was also self-financing, with higher tax revenue from increased employment and savings from reduced benefits exceeding program costs. Wage insurance is therefore a promising option for helping trade-displaced workers quickly return to work, particularly among those for whom retraining may not be effective, feasible, or available.

An important caveat to the favorable findings for standard TAA and wage insurance is that the programs are relatively small (TAA served an average of 24,000 workers per year from 2009-2022), so their existence is unlikely to induce spillovers through general equilibrium. If a larger share of workers were eligible for these policies, it is likely that eligible workers' favorable outcomes would come partly at the expense of ineligible workers or that firms would change their hiring strategies to capture a portion of the subsidies. We are unaware of evidence on these equilibrium effects in the specific context of policies targeting trade-displaced workers, but Crépon et al. (2013) document evidence for equilibrium spillovers associated with another active labor market policy.

Given the evidence in Sections 3 and 4 finding spatially concentrated effects of trade policy changes, support for geographic relocation may help workers migrate to stronger markets and speed labor market transitions. For example workers could apply for financial support to search for jobs outside their local labor market or governments could subsidize moving costs upon finding a job elsewhere. In the context of Bangladesh, Bryan et al. (2014) found that a modest subsidy induced a significant share of rural workers to migrate to urban areas during the pre-harvest season, with positive effects on income and consumption and persistent effects via repeated migration in subsequent years.

Another potential means of facilitating worker transitions is to use algorithmic job recommendation systems to lower search costs for jobs that might be a good fit for trade-displaced workers but of which they might be unaware. Carranza and McKenzie (2024) observe that in many countries, the vast majority of workers search for jobs through friends and relatives. As these networks are often concentrated by location and industry, it is likely that trade policy changes will affect network members' prospects similarly. Job recommendation tools can broaden opportunities available to workers by presenting job openings in distant labor markets or in alternative industries or occupations whose skill demands match a searching worker's experience. The evidence on these systems is thus far mixed, with some increasing employment probabilities and/or earnings (Altmann et al., 2022; Belot et al., 2025a,b; Le Barbanchon et al., 2023), and others minimally affecting workers' outcomes (Bächli et al., 2025; Ben Dhia et al., 2022; Bied et al., 2025). An informal comparison of the papers just cited suggests that effects are more likely to be favorable when searching workers are incentivized to meaningfully engage with the recommendation system and when job recommendations are based on observed worker transitions, though more evidence is needed.

Trade policy reforms themselves could also be adjusted to account for the costs associated with labor market frictions. For example, the government could plan a gradual change in policy to avoid abrupt labor-market disruptions, allowing firms and workers time to prepare and adjust. The cost of this gradualism would be to delay the long-run gains from trade, with the potentially offsetting benefit of reducing short-run adjustment costs. As discussed in the preceding section, trade reforms can also be coupled with reforms relaxing labor market regulations, with the goal of making labor markets more flexible and helping trade-displaced workers find reemployment more quickly (Kambourov, 2009).

Finally, we conclude by emphasizing that, ideally, governments will implement policies for which there is evidence of success and that have undergone credible cost-benefit analysis. However, even imperfect policies may be beneficial if they compensate those who lose the most due to globalization and help maintain support for free trade. In the absence of some policy response supporting those experiencing the downsides of trade liberalization, the ongoing backlash against free trade is likely to continue, with trade wars reducing economic efficiency and eroding consumer purchasing power. Demonstrating concern for workers bearing the costs of globalization will likely be essential for political success in the years to come.

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