

**TRADE, TRADE POLICY, AND  
LOCAL LABOR MARKET EFFECTS:  
A REVIEW OF LITERATURE**

Emma Blair

Tamara Gurevich

**ECONOMICS WORKING PAPER SERIES**  
Working Paper 2021–10–A

U.S. INTERNATIONAL TRADE COMMISSION  
500 E Street SW  
Washington, DC 20436

October 2021

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Trade, Trade Policy, and Local Labor Market Effects: A Review of Literature  
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Office of Economics Working Paper 2021–10–A  
October 2021

### **Abstract**

We review the theoretical and empirical literature on local labor market effects of trade and trade policy. We summarize literature on: (1) sector- and industry-specific impacts, (2) factor immobility of labor and geographic concentration of effects, and (3) labor adjustment, which leads to local labor market, poverty and distribution, and spillover effects. We also highlight areas in the literature for future research.

Emma Blair,  
Front Office, Office of Economics  
U.S. International Trade Commission  
[emma.blair@usitc.gov](mailto:emma.blair@usitc.gov)

Tamara Gurevich,  
Research Division, Office of Economics  
U.S. International Trade Commission  
[tamara.gurevich@usitc.gov](mailto:tamara.gurevich@usitc.gov)

Exposure to international trade and trade policy can affect local labor markets in a variety of ways. Effects related to specific sectors of the economy (“sectoral impacts”), and industries within those sectors, differ due to geographic location, exposure to imports, education of workers, and other factors. Workers and capital in impacted industries may also face barriers to moving between different areas of the economy, known as “factor immobility.” This issue, combined with the geographic concentration of impacted sectors, can lead to workers being “stuck” as markets respond to changes in trade and trade policy, resulting in a range of local labor market effects. The resulting labor adjustment can take the form of changes in employment shares and earnings, labor market participation rates, take-up of publicly funded benefits, and job creation rates. These effects also spill over, impacting poverty and inequality, wage dispersion, and public goods and services at the local and regional level, as well as sectors not directly affected by international trade and trade policy.

This paper reviews the literature focused on the ways in which trade and trade policy affect local labor markets, including: (1) how trade can impact some sectors and industries differently and (2) how geographic concentration and factor mobility barriers in some sectors and industries can lead to (3) some workers being “stuck” as (4) regional markets respond to these impacts. The availability of literature on this topic varies at each step. Literature on sectoral impacts of trade and trade policy focuses largely on the U.S. manufacturing sector due to practical interest in this topic and data availability, however literature examining services sectors emerged in recent years. As such, discussion in this paper is focused primarily on industry-specific impacts within the manufacturing sector, but the available literature on cross-sector impacts is also discussed. There is substantial work focusing on factor immobility and the geographic concentration of trade impacts. Labor adjustment is the most prevalent topic related to local labor market effects, while impacts on poverty and distribution and outcomes in non-traded sectors are less studied.

Generally, the literature indicates that exposure to import competition varies across in-

dustries in the manufacturing sector, and increased exposure leads to negative effects on workers in those industries (increased unemployment, decreased subsequent earnings, decreased employment growth, etc.). Additionally, a thread of this literature focusing on cross-sectoral effects of trade and trade policy shows that worker displacement in the manufacturing sector has spillover effects onto other sectors, particularly the services and construction sectors. As workers in trade-vulnerable industries are impacted, they transition out of the manufacturing sector and into less vulnerable sectors, which may put downward pressure on wages in their new sectors. An important finding of this literature is that trade-vulnerable industries and sectors tend to be geographically concentrated and feature workers that face mobility issues. The effect of this factor immobility and geographic concentration is discussed extensively in the primary component of this literature review, which focuses on labor adjustment.

The remainder of this paper gives an overview of the literature covering each step outlined above. Section 2 discusses characteristics that shape the impacts of trade on industries within the U.S. manufacturing sector. A sub-section is devoted to the sparse literature related to the sectoral and cross-sectoral impacts of trade and trade policy, focusing primarily on the services and manufacturing sectors. Section 3 discusses the geographic concentration of effects and factor immobility through different frameworks. Section 4 focuses on the following local and regional effects: (1) labor adjustment, (2) poverty and distribution, and (3) other (non-traded) sector spillovers. Section 5 discusses possible future trends and remaining gaps in the literature, and section 6 concludes.

## 2 Impacts of Trade and Trade Policy in the Manufacturing Sector

The impacts of trade and trade policy differ across an economy's sectors and industries and for its different types of workers. Sectors and industries of an economy vary based on geographic location, production technology, and composition of the labor force. Measures of import competition represent the extent to which the domestic industry competes with imports, and is another factor that differs across sectors and industries.

Addison et al. (1995) was among the first to directly link the trade sensitivity of a worker's industry within the manufacturing sector to economic dislocation, specifically job loss, duration of unemployment, or subsequent reduction in earnings. The authors use import penetration rates, export penetration rates, average trade penetration rates, changes in import penetration, and changes in export penetration as alternative measures of trade sensitivity.<sup>1</sup> While the authors do find a significant positive relationship between trade sensitivity and the likelihood of job loss, namely that the likelihood of job loss increases with trade sensitivity, the authors find no evidence that trade sensitivity is related to the duration of unemployment or subsequent change in earnings. They argue these findings indicate that, while trade sensitivity may lead to worker displacement in the short run, it does not have impacts on outcomes following employment termination.

Like Addison et al. (1995), import exposure of industries in the manufacturing sector is also the focus of Bernard et al. (2006), which introduces a new measure of industry exposure to international trade by focusing on the location of import origination, rather than the overall level of imports. However, instead of studying the relationship between trade sensi-

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<sup>1</sup>The import penetration rate is the ratio of U.S. imports of a good to the domestic supply of the good (imports plus domestic product shipments); export penetration rate is the ratio of U.S. exports of a good to the value of domestic product shipments. Average trade penetration, then, combines these two measures using the simple arithmetic mean. Lastly, the change in import (export) penetration is simply the percentage point difference between import (export) penetration rates in 1982-86.

tivity and economic dislocation of workers, Bernard et al. (2006) focuses on production plant survival and growth. The authors find a negative relationship between industry exposure to imports from low-wage countries and plant survival, indicating that imports from low-wage countries lead to more plant closures. Moreover, the authors look within the manufacturing sector to show that, when dislocated by exposure to international trade, manufacturing activity is disproportionately reallocated towards capital-intensive plants. Firms may also switch industries (i.e., manufacture a different product) altogether when their import exposure is high. In terms of impacts on workers, the authors report that increased import competition from low-wage countries is negatively and significantly correlated with employment growth.

Another paper by Pierce and Schott (2012) uses a change in U.S. trade policy towards China to investigate the relationship between employment in the U.S. manufacturing sector and increased exposure to Chinese imports. While prior to 2001 the U.S. had granted Normal Trade Relations (NTR) status to Chinese imports via waivers, these low rates required annual renewals that were uncertain and politically contentious. Without such renewals, tariff rates on Chinese imports would have increased to higher non-NTR rates. China's accession to the World Trade Organization (WTO) in December 2001 eliminated this uncertainty and established Permanent NTR with China. The authors find a link between this change in U.S. trade policy and a decline in U.S. manufacturing employment. There is some evidence that part of this change in employment was driven by offshoring, the practice of relocating company operations overseas to take advantage of lower costs. However, the general trend underlying these findings, as related to the impact of import competition, aligns with Addison et al. (1995) and Bernard et al. (2006).

Trade and increased globalization have varying impacts not only across manufacturing industries, but also across demographics. Sachs et al. (1994) identifies the impact of trade on workers in U.S. manufacturing, differentiating between "low-skilled" and "high-skilled" workers. The authors note three labor market trends in the United States that coincided with

growing globalization between the 1970s and 1990s: (1) a decline in overall manufacturing employment, (2) a widening of income inequality between low- and high-skilled workers, and (3) an especially sharp decline in employment in low-skilled manufacturing. By disaggregating trade into 131 manufacturing categories and more than 150 trading partners from 1978 to 1990, the authors find that globalization has contributed to the decline of manufacturing employment, particularly for low-skilled workers. Additionally, widening wage inequalities between low- and high-skilled workers may be a product of this trend.

Howland and Peterson (1988) also highlights different impacts by type of workers in the manufacturing sector, but focuses on local labor market conditions and their impact on the financial losses of displaced workers. The authors use data from the January 1984 Current Population Survey and find that stronger overall growth in the local economy reduces the economic losses of “white-collar” workers whose industry was declining, but not necessarily of “blue-collar” workers. Moreover, they find that all workers, regardless of education, skill level, or age, suffer larger financial losses when located in a depressed local economy. This paper shows that local labor market conditions are another important factor to consider when identifying the sectoral and industrial impacts of trade and trade policy.

Lastly, recent literature suggests that improvements in technology may exacerbate the impacts of trade on local labor markets and may even add to the sectoral and industrial differentiation of these effects. Autor et al. (2014a) offers a juxtaposition of the effects of trade and technology on employment in U.S. local labor markets from 1980 to 2007. While both trade and technology affect local labor markets, the authors find divergence between the two; rather than finding that technology and trade are mutually reinforcing in shaping labor market developments, Autor, Dorn, and Hanson find that the two have distinct impacts. Import competition from trade leads to sharp declines in local employment, particularly in the manufacturing sector and among workers without college degrees, while exposure to routine task specialization (from technology) has largely neutral employment effects. Workers

without a college degree are most affected by trade, but experience only small employment declines from technological change. They find that non-college employment declines from trade competition even occur outside of the manufacturing sector, which may be a result of local demand spillovers. Other findings at the sectoral level are discussed further in the next section.

## **2.1 Sectoral and Cross-sectoral Impacts of Trade and Trade Policy**

The literature on the sectoral impacts of trade and trade policy is largely focused on industries within the manufacturing sector, but there is some evidence of sectoral and cross-sectoral impacts as well. In particular, the literature highlights the differences in impacts between sectors and potential spillover effects from one sector to another (usually, manufacturing to services).

Menezes-Filho and Muendler (2011) studies labor reallocation following trade liberalization in Brazil in the 1990s and show that tariff cuts led to worker displacement and subsequent increased transitions to the services sector. Similarly, Ebenstein et al. (2014) finds evidence of the reallocation of workers away from manufacturing jobs into other sectors of the U.S. economy as a result of trade. Using industry-level data on trade and offshoring and individual-level worker data from the 1984–2002 Current Population Surveys, this paper expands the literature beyond the manufacturing sector, looking at wage effects across the economy, including in non-tradable services sectors like fast food. The authors find no effects of international trade or offshoring at the industry level, but focusing on the occupational level and including manufacturing and services, they find large and significant wage effects of exposure to globalization (trade). Increased trade competition puts downward pressure on worker wages by displacing workers from higher-paying manufacturing jobs to lower-wage jobs in services sectors and by shifting labor away from trade-vulnerable occupations. Across sectors, they find that workers in routine occupations suffer greater losses from globalization.



The Autor et al. (2014a) paper, discussed in the previous section, also investigates trade and technology impacts on local labor markets and finds that the impact of technology and trade on employment differs, in magnitude and direction, by occupation and sector. Like Ebenstein et al. (2014), this paper differentiates between routine and non-routine occupations. Job losses from technology in routine task-intensive occupations are largely offset by local employment growth in more manual-task-intensive and abstract occupations. This pattern occurs in both manufacturing (e.g., in routine production jobs) and non-manufacturing (e.g., in routine clerical jobs) sectors. Conversely, trade exposure also causes large employment declines in routine jobs in manufacturing, but these losses are not offset with job gains. Rather, further job losses occur in manual and abstract, task-oriented jobs, so there is a strongly negative overall employment effect of import competition (whereas technology has a relatively neutral effect). Thus, while changing technology results in shifting occupational composition within sectors, import competition has a broad sectoral impact, leading to negative employment effects even for higher-skilled workers in non-routine jobs.

Noting that there is little evidence on whether trade liberalization leads to structural change in an economy at the sector level, Wacziarg and Wallack (2004) attempts to fill this gap by studying the movement of labor across sectors in response to trade liberalization, but do not find significant evidence of this reallocation. Using 25 liberalization episodes, primarily in developing economies, the authors find evidence suggesting weakly negative effects of liberalization on intersectoral labor shifts on a broad sector level. These findings contradict the idea that trade liberalization would result in increased labor movements across sectors. However, looking at industries in manufacturing, the authors do find increased inter-industry mobility after liberalization, though these estimates are small in magnitude and not statistically significant. The authors find that liberalization impacts vary across countries and depend in part on the scope and depth of reforms, but trade liberalization has smaller effects on intersectoral labor shifts than often presumed and it does not lead to declines in

employment in broad sectors.

## 2.2 Linking Manufacturing and Services Sectors

In recent years, the scope of this literature has broadened to study the effects of trade and trade policy on the services sector and the economy as a whole in general equilibrium framework. The findings from this emerging literature are discussed in this section.

While it does not follow a general equilibrium framework, Acemoglu et al. (2016) does incorporate services into its analysis. Findings are similar to earlier literature in that the historic contraction in manufacturing employment from 2000 and 2007 was driven largely by increased imports from China. However, the authors look further, estimating that overall weak U.S. job growth during this time period was, too, a result of import competition from China largely through input-output and cross-sectoral linkages. The authors' direct estimates indicate that, absent increased import penetration from China after 1999, there would have been 560,000 fewer manufacturing job losses from 2000 to 2011. However, incorporating full input-output measures, which account not only for shocks to an industry's immediate buyers or suppliers but also for the full set of input-output relationships among all connected industries, albeit not in a general equilibrium model, estimates of trade-induced job losses in 1999–2011 increase to 985,000 in the manufacturing sector alone, and 1.98 million workers in the entire economy.

Caliendo et al. (2019) provides an extensive study of trade and labor adjustment in a general equilibrium setting, focusing specifically on the sharp rise in U.S. imports from China from 2000 to 2007. This increased import competition affected the manufacturing sector most heavily, resulting in a reduction of about 550,000 U.S. manufacturing jobs. This decline accounted for approximately 16 percent of the observed decline in U.S. manufacturing employment over the same period. In conjunction with these manufacturing impacts, the authors find that workers tend to relocate to the construction and services sectors, noting

that 20 percent of the total increase in employment was in the health industry, 10 percent of the increase was in the construction sector, and another 10 percent was in the education sector. These findings are in line with the other papers noted that indicate a transition from manufacturing to the services sector following changes in trade and trade policy.

Rodríguez-Clare et al. (2020) aligns with the general consensus of the literature that the regions most exposed to import competition from China experience a significant decline in employment. However, the authors indicate that this decline is temporary, and employment eventually rises to a level above the pre-shock level. In the United States as a whole, the authors find that the “China shock” is responsible for an overall decline in the employment to population ratio. However, by 2008 the U.S. employment to population rate is slightly higher than pre-shock levels. Furthermore, the authors find that the welfare increases in the wake of the “China shock” in most U.S. regions, including some of those that experience unemployment during the transition.

Feenstra and Sasahara (2017) quantifies the impact of the increased imports from China on U.S. employment and find results similar to other papers, estimating a loss of 1.4 million jobs in manufacturing and 0.6 million jobs in services sectors. In addition to examining the effects of the “China shock” on imports, the authors examine its impact on U.S. exports in 1995–2011 and find that the expansion of U.S. merchandise exports to the world relative to imports from China created a net gain of about 1.7 million jobs. Most notably, the authors show that while demand for jobs in U.S. manufacturing decreased, the increased demand for services jobs offset this loss. In other words, when services exports are included and total imports and exports are compared, there is a rise in net labor demand compared to the pre-shock period. Dix-Carneiro et al. (2021) reports similar findings, showing that while the increase in imports from China contributed to decline in U.S. manufacturing employment, jobs were soon created in the services sector leading to an overall small net effect.

### 3 Factor Mobility and Geographic Concentration

While technological change broadly impacts sectors and industries across the United States, the impacts of trade are more concentrated geographically.<sup>2</sup> Trade and trade policy may impact workers in different sectors differently, but the mechanism by which trade influences local labor markets is the geographic concentration of sectors and industries and limited geographic mobility of workers. Given this regional concentration of industries exposed to trade, if workers are unable to move freely across different parts of the economy, then significant local and regional labor market impacts can be expected.

Recent studies in this area have found that trade liberalization reduces the wages of low-skilled labor and leads to greater income inequality. Topalova (2010) explores the mechanisms through which trade reform may impact income distribution, highlighting the importance of factor mobility. The author finds that, while poverty declined in both rural and urban India in the 1990s following the country's opening to international trade, rural areas where many workers were employed in industries subject to larger reductions in tariff protection reported lower levels of poverty reduction. Moreover, the findings are reported to be consistent with a model of trade in which labor is immobile in the short run, as there is little evidence of trade-induced reallocation of workers across geographical districts or production sectors, and Indian states with labor laws that impede reallocation of labor are the areas with the most severe adverse effects.

Artuç et al. (2010) also examines factor mobility by considering the relationship between the welfare effects of trade shocks and the costs workers face in moving between sectors. While much of the literature relies on static models with workers that are assumed to be either instantly and costlessly mobile or perfectly immobile, Artuç et al. (2010) expands this analysis to a more dynamic framework. The authors estimate the mean and variance

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<sup>2</sup>For example, see Autor et al. (2013) and Autor et al. (2014a).

of workers' switching costs from the U.S. Current Population Surveys. Both parameters for moving from one broadly aggregated sector of the economy to another are estimated to be several times the average annual wages, indicating slow adjustment of the economy in response to trade shocks. These findings highlight the impacts that trade and trade policy may have due to the costs of transitions for workers.

In addition to moving across space, workers may also find barriers to moving from one sector to another. Dix-Carneiro (2014) uses a dynamic equilibrium model of the Brazilian labor market that includes costly switching of sectors. Like Artuç et al. (2010), Dix-Carneiro estimates the median costs of mobility and finds a range from 1.4 to 2.7 times the average annual wage, with a high dispersion of these costs across the population. Moreover, by including endogenous accumulation of sector-specific experience, the author finds additional barriers to mobility. Overall, findings align with Topalova (2010) in that there is a large labor market response (i.e., worker reallocation) following trade liberalization, and with Artuç et al. (2010) in that this transition is slow. Due to the delayed adjustment, Dix-Carneiro (2014) finds that potential aggregate welfare gains from trade liberalization may be significantly reduced, but trade-induced welfare effects also depend on the initial sector of employment and other worker demographics.

Dix-Carneiro and Kovak (2019) examines both regional and cross-sectoral margins of labor market adjustment, looking specifically at formal and informal employment sectors in Brazil. The authors find that in presence of trade shocks that affect some regions more than others, workers' initial region of employment is crucial in determining the subsequent wage and employment status. Workers initially employed in regions more affected by the shock are less likely to be employed in formal sectors and earn less. At the same time Dix-Carneiro and Kovak (2019) finds no evidence that workers move across regions in response to trade shocks.

Commuting and migration are other factors that may influence factor mobility: they

serve as spatial linkages in factor markets. Firms in a location aim to attract workers, and this ability depends on whether they can attract local residents and whether they are able to attract commuters from other nearby locations. Using county-level data from the United States, Monte et al. (2018) shows that firms' ability to attract workers depends on the commuting openness of the local labor market. Furthermore, the authors' estimates suggest that moving people is more costly than moving goods across geographic space. The authors find that reducing commuting costs can lead to substantial welfare gains and changes in employment. While the authors do not directly discuss the relationship between commuting and migration costs and trade and trade policy, these findings relate to difficulties in labor adjustment following trade shocks, leading to workers being "stuck."

Kambourov (2009) considers a different factor that may restrict reallocation and mobility of workers, the degree of regulation within labor markets. The author begins from the assumption that trade liberalization is beneficial because the removal of trade barriers results in workers reallocating toward sectors in which their domestic economy has a comparative advantage. However, institutional features of the local labor markets have an effect on the impact of trade reforms; labor market regulation influences the amount and speed of reallocation, in addition to post-reform output, productivity, and welfare. Kambourov finds that high firing costs (e.g., requirements to provide advance notice or compensation for dismissal) slow down reallocation of labor across sectors after trade reforms by impeding firms' ability to fire workers. These costs have two effects that disrupt gains from trade: (1) firms do not fire the optimal number of workers, and (2) firms are cautious in hiring new workers due to the potential for facing firing costs in the future. In countries that liberalize trade in a rigid labor market environment, reallocation may be up to 30 percent slower than in countries with a more flexible labor market environment. Furthermore, Kambourov finds that a rigid labor market may also lead to as much as a 30 percent reduction in potential gains in real output and labor productivity.

Geographic concentration of workers and sectors is another factor in the response of local labor markets to trade and trade policy changes. Bednarzik and Shelburne (1993) studies the geographic concentration of trade-sensitive employment, finding that manufacturing industries which are more involved in international trade also tend to be more geographically-concentrated. Moreover, trade-related employment displacements are also geographically concentrated. The authors argue that due to this “clustering”, reemployment is likely more difficult when a worker loses a job in an industry that is concentrated. Among different industries, mining is the most concentrated as geological deposits are highly localized; agriculture, subject to natural conditions like weather, soil, and environmental patterns, is also concentrated. While manufacturing is typically more flexible than these sectors, it is only slightly less concentrated. Services and construction (which may be non-traded), however, are significantly less concentrated.

Caliendo et al. (2019) also finds evidence of geographical concentration of industries that face import competition in the United States. Similar to Bednarzik and Shelburne (1993), the authors indicate that U.S. economic activity and import exposure are not equally distributed across space; rather, trade-sensitive industries tend to be concentrated in certain regions. For example, employment in the computer and electronics industry, which faces significant import competition from China, is heavily concentrated in California. Generally, U.S. states that feature a larger concentration of trade-sensitive industries also tend to lose more manufacturing jobs in response to trade shocks. However, California, which features a lower concentration in overall manufacturing than other states, experienced the largest increase in non-manufacturing employment following the China shock. The authors also find that changes in employment shares by sector tend to be geographically concentrated in trade-sensitive sectors. While the reduction in local employment shares in the manufacturing industry is concentrated within a handful of states, the increase in local employment shares in non-manufacturing sectors is more equally distributed across U.S. states.

Helm (2020) also explores the spatial concentration of economic activity, but unlike the previously discussed studies, the author focuses on agglomeration. In addition to sector-specific factors, agglomeration economies, where firms benefit from productivity or cost advantages when they locate near other firms, are an additional explanation for geographic concentration and clustering.<sup>3</sup> Helm finds that positive trade shocks, which increase demand for products made by the affected industries, result in increased employment in those industries. Moreover, there are positive spillovers from other tradable industries' shocks; these spillover effects tend to be stronger within the same broad sector and are only generated by high-technology industries. These spillover effects indicate that positive trade shocks increase employment both within the directly affected industry and in other industries, particularly in those that are within the same broad sector. The author finds that worker transitions between industries following trade shocks are largely responsible for employment spillovers. Overall, Helm's findings highlight the potential to incorrectly estimate the regional effects of trade shocks if indirect effects are not considered, as geographical concentration and agglomeration may result in spillover effects across industries and, to a smaller extent, sectors.

## 4 Local and Regional Effects

The literature on local and regional effects of trade and trade policy focuses on labor adjustment, poverty and distribution (welfare) effects, and spillovers onto the non-traded sector. As trade has different effects on workers in different sectors, and workers facing import competition tend to be geographically clustered with low mobility in the short-term, researchers identify a variety of local labor market effects.

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<sup>3</sup>These benefits may result from decreases in transportation costs or the potential for knowledge spillovers.



## 4.1 Labor Adjustment

Autor et al. (2013) focuses on the local labor market effects of rising import competition from China in the United States (the “China shock”). The authors find that the rising imports from China and increased import exposure of U.S. firms result in higher unemployment, lower labor force participation, and reduced wages in the local labor markets that contain import-competing manufacturing industries. Specifically, import competition explains about a quarter of the contemporaneous aggregate decline in U.S. manufacturing employment. Importantly, the authors find that exposure to Chinese import competition does not just affect local labor markets through manufacturing employment, but also through a decline in wages observed primarily outside of the manufacturing sector. This decline in manufacturing employment increases the supply of workers in non-manufacturing sectors, leading to a downward pressure on wages in those sectors (i.e., cross-sector impacts). Additionally, reductions in employment and wage levels lead to a decline in average household earnings. As such, the authors find that local labor markets with higher import exposure see sharp increases in transfer payments for unemployment, disability, retirement, and healthcare.

Autor et al. (2014b) further investigates the impacts of exposure to rising import competition from China on U.S. workers’ earnings and employment. The authors find that individuals who worked in manufacturing industries that experienced high import growth receive lower cumulative earnings over the sample window of 1992 to 2007 and face a higher risk of collecting disability benefits. Trade exposure also increases job churning across firms, industries, and sectors, so compared to industries with less trade exposure, workers in industries with high import growth spend less time working for their initial employers and less time within the manufacturing sector more broadly, as they transition to less trade-exposed sectors. Moreover, the authors differentiate among low- and high-wage workers, finding that earnings losses from import competition are larger for those with lower initial wages, shorter

initial tenure, and “lower attachment” to the labor force (part-time or intermittent workers). Furthermore, lower-wage workers tend to churn throughout the manufacturing sector, which continuously exposes them to subsequent trade shocks and rising import competition. In contrast, high-wage workers have more mobility and are thus able to move across employers, industries, and sectors, minimizing earnings losses. Generally, these findings demonstrate that import shocks involve significant labor adjustment costs that are distributed unevenly across workers.

Hakobyan and McLaren (2016) continues this line of investigation, but focus on the effects of the North American Free Trade Agreement (NAFTA) and subsequent U.S. exposure to imports from Mexico, rather than China. They estimate the effects of NAFTA on U.S. wages by industry and geography. Industries are subject to varying degrees of import competition from Mexico, and localities are subject to varying degrees of dependence on vulnerable industries. Findings indicate that “blue-collar” workers in the most vulnerable industries and localities experience dramatically lower wage growth; this finding extends beyond the direct impact in the manufacturing industry to service workers in affected localities. The authors further posit that the impacts on service workers’ wages are likely due to increased competition for jobs from trade-displaced workers (i.e., cross-sector impacts) and a resulting decrease in consumer spending on non-traded services. Similar to Autor et al. (2014b), the authors also find that there are significant distributional effects, resulting in a small number of workers seeing substantial negative effects from trade competition.

Kondo (2013) also looks at the relationship between U.S. employment and foreign competition, but focuses more on displacement and job creation than wage impacts. Like Hakobyan and McLaren (2016), Kondo focuses on individual localities and finds that areas subject to more foreign competition have higher job destruction rates, lower job creation rates, and lower employment rates. The author finds that an unexpected trade liberalization coupled with limited labor mobility results in a sharp decline in employment in locations facing

greater degrees of import competition, despite an aggregate increase in welfare and employment.

Moving beyond labor adjustment within the United States, researchers also focus on the impact of trade and trade policy on labor markets in other countries. Menezes-Filho and Muendler (2011) investigate labor reallocation in response to trade liberalization in Brazil in the 1990s. The authors find that tariff cuts result in worker displacements, especially in previously protected industries, but neither exporters nor comparative-advantage sectors absorb the displaced workers for several years. Rather, exporters terminate more employees and hire less than the average employer. Brazil's trade liberalization resulted in increased transitions from the formal manufacturing sector to services, unemployment, and movement out of the labor force altogether. The authors argue that these results highlight how trade liberalization can lead to efficiency gains for specific firms and industries that gain product-market shares as trade barriers fall, but not necessarily in the aggregate due to the slow reallocation process resulting in idle resources..

## 4.2 Poverty and Distribution

In addition to the significant adjustments within the labor market that result from changes in trade and trade policy, there are also related impacts on poverty and distribution of income. Using evidence from Indian districts, Topalova (2005) investigates the relationship between trade liberalization and poverty and inequality. While theory broadly indicates that trade liberalization raises GDP in the aggregate, there are also important effects on individuals. Topalova finds that, following trade liberalization, poverty incidence and depth decreased less in districts containing industries that were more exposed to the liberalization. Specifically, these districts faced a "setback" in poverty reduction of about 15 percent. Topalova also notes that these findings are likely related to India's extremely limited mobility of labor across regions and industries.

Feliciano (2001) also focuses on distribution and inequality by studying the impacts of trade liberalization and reforms in Mexico. The author explores the impact of significant trade liberalization reforms on wages and employment, finding only a modest effect overall in the Mexican labor market. However, wage dispersion increased in both the “non-tradables” and “tradables” sectors, which suggests an increase in wage inequality as a result of the trade reform. While Feliciano acknowledges that other contemporaneous policy changes, such as a decline in the real minimum wage and union concessions, may have contributed to wage dispersion, the increase in dispersion was much larger in the tradables sector. As such, the author argues this implies the influence of trade policy. Moreover, industries that experienced greater reductions in trade protection levels (tariffs) also had larger percentages of low-skill workers, which may have exacerbated these effects due to factors like limited geographic and inter-industry mobility.

Lastly, a recent paper by Feler and Senses (2017) takes a different approach, considering the impact of trade shocks on the provision of local public goods and services. While public goods and services are not directly tied to poverty or distribution, their provision is funded through property and sales taxation, which are impacted by local poverty and income levels. The authors analyze the impact of trade-induced income shocks on local governments’ provision of public goods and services. Localities in the United States that experience declining labor demand and income due to increased import competition from China are shown to experience relative declines in business activity and housing prices. Since local governments are funded largely by property and sales taxation, these declines lead to less funding for public goods and services. Specifically, an increase in Chinese imports per worker is found to result in a relative decline in per capita expenditures on public welfare, public transport, public housing, and public education.<sup>4</sup> As such, the impacts of wage and income dispersion that individuals experience due to trade may be exacerbated locally by declines in the quality

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<sup>4</sup>Per capita spending on public safety remains unchanged.

and quantity of public goods and amenities available in trade-exposed localities.

### 4.3 Non-traded Sector Spillovers

One step removed from spillover effects in the local labor market, trade and trade policy also have the potential to have spillover effects on non-traded sectors, impacting the prices of non-traded goods and generating responses within the informal sector. There have been a few studies on these indirect effects. Oda and Stapp (2003) develops a model of non-traded goods to investigate how trade, trade liberalization, and changes within the traded sector influence the price of non-traded goods. In the context of international trade, industries that produce goods can be grouped into three broad sectors: an export sector, an import sector, and a non-traded goods sector. As international trade has expanded and production processes have become more fragmented globally, traded sectors have been connected among countries, leaving the non-traded sector as the local “home” market. The authors find that a decline in the price of imports (a tariff reduction) may increase the relative price of non-traded goods: consumer demand of non-traded goods may increase as consumers’ real income increases due to improvements in terms of trade.

The informal sector, which does not comply with labor market legislation, is generally believed to expand in developing countries due to increased foreign competition. However, Goldberg and Pavcnik (2003) considers the response of the informal sector to trade liberalization and do not find much support for this argument. The authors use data from Brazil and Colombia, which experienced large trade barrier reductions in the 1980s and 1990s, respectively. In Brazil, Goldberg and Pavcnik find no evidence of expansion of the informal sector, while in Colombia, there is evidence of some impact, but only for a period preceding a major labor market reform. Overall, these findings indicate that labor market institutions are an important factor to consider in assessing the effects of trade policy on the labor market.

## 5 Current Issues and Future Trends in Literature

Despite increased interest in the impacts of trade and trade policy in recent decades, the scope of this literature is still relatively narrow, mainly focused on labor adjustment and factor mobility. Additionally, many researchers have investigated industry-level impacts within the manufacturing sector. However, substantial gaps remain for certain topics, which presents opportunities for future research.

First, sectoral impacts of trade and trade policy have been largely neglected so far. Both the differentiated impacts of trade and trade policy by sectors outside of manufacturing and the relationship between trade policy and cross-sectoral adjustments are potential avenues for future research. As noted by Arnold et al. (2011) and Oda and Stapp (2003), the services sector represents a significant part of many countries' economies and some services industries may still face extensive trade barriers. As such, extending our knowledge of trade impacts beyond the manufacturing sector into sectors like services is increasingly relevant. Additionally, the labor adjustment literature indicates that trade liberalization in the manufacturing sector may lead to worker transitions to the services sector and these cross-sector movements affect employment and wages in the services sector. The literature exploring these dynamics could be greatly extended; currently, authors tend to discuss any impacts outside of the manufacturing sectors as secondary effects, rarely focusing directly on services or non-traded sector impacts.

Additionally, while the literature does consider the impacts of trade and trade liberalization on workers of different wage and education levels, and workers performing different kinds of tasks (routine v. non-routine), there are some gaps in analysis of other demographic factors like gender and race. Further research could be done to disaggregate impacts on these levels in order to better understand local labor market effects and how these differ across types of workers.

## 6 Conclusion

Trade and trade policy are complex issues because they produce effects that take place on a variety of levels. While most literature focuses specifically on the manufacturing sector, there is substantial evidence that trade and trade policy affect different industries and sectors in different ways, sometimes also causing cross-sectoral spillover effects. Industry- and sector-level impacts, combined with the factor immobility that some workers face and the geographic concentration of many industries and sectors, results in significant local labor market effects from trade and trade policy. By considering the mechanism through which these local labor market effects occur, we can better understand how workers are affected and labor adjusts, which may prove important for consideration in trade policy going forward.

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