Chapter 8: Do multinational firms export jobs?

Lindsay Oldenski
Georgetown University
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Abstract: Offshoring by multinational firms is a controversial topic. Multinationals often move production offshore, negatively affecting the displaced workers. But in many cases, this offshoring enables job creation at home. The majority of US firms that increase their offshoring simultaneously hire more workers in the US, suggesting that offshoring does not simply substitute for domestic employment. However, the effects on US workers are heterogeneous, as less educated workers and those who perform routine tasks are more likely to experience job losses and reduced wages as a result of offshoring, while more highly educated workers gain. Evidence suggests that worker training programs can help mitigate some of the negative effects of offshoring without sacrificing the benefits.

Introduction

By definition, multinational firms do some of their work outside of their headquarters country. As a result, it may seem inevitable that they "export jobs" by hiring employees in other countries. This process, also known as offshoring, often has very negative connotations, conjuring up images of firms that fire workers at home and replace them with cheaper labor in another country. And this type of offshoring certainly does occur, resulting in real harm to the displaced workers. Yet multinational firms are large and complex. They expand abroad in many different ways and for many different reasons, which may have different consequences for workers in their home country, some positive and some negative. For example, a US firm may set up a plant abroad not to replace US production, but to gain access to a market that would have been otherwise difficult to serve. This market access may allow the firm to grow and expand in ways that benefit their employees at home, as well as abroad.

This chapter will examine the evidence on offshoring by multinational firms and draw conclusions about the aggregate effects on US workers, as well as identifying which types of workers are more likely to gain or lose from offshoring and how big those gains and losses are likely to be. Programs designed to help workers displaced by offshoring will also be discussed and evaluated.

Because the US has much higher wages and worker benefits than other countries, firms have an incentive to cut costs through offshoring and labor-substituting technologies. However, the data show that while some US workers are displaced, new high-paying jobs are created in the US by firms that offshore production. In general, more highly skilled workers gain and lower skilled workers are more likely to lose their jobs. Programs that help retrain displaced workers

have been shown to mitigate the losses, though these programs would need to be greatly expanded in order to assist all workers that have been negatively affected by offshoring.

In this chapter, the word "offshoring" will be used to describe any production done by a multinational enterprise (MNE) outside of its headquarters country. Offshoring can take the form of a US company shutting down a factory in the US and moving those jobs to another country. In this case, US workers are clearly hurt by this action, as they are left unemployed and competing with other laid off workers for potentially scarce jobs. But this is not the only effect of offshoring on US workers. While some workers are clearly hurt by offshoring, others gain as their firms become more competitive, allowing them to expand and hire more employees in the US. Sorting out these different effects of offshoring on US workers is challenging. One problem with trying to measure these effects is that the jobs that are lost due to offshoring and the jobs that are gained are often in different cities and/or different occupations. Not only does this complicate our understanding of how offshoring works, but it is also not very reassuring to tell an auto assembly worker in Detroit that there are plenty of new sales jobs available in California. In many cases, it is extremely difficult for workers to find jobs that are similar to the ones that were offshored, resulting in very real costs.

Ford Motor company provides one example of the complexity of multinational production. In 2016 Ford announced plans to shift all of its small car production from the US to Mexico. But around the same time, they also announced plans to invest $4.5 billion over the next four years in new battery-powered models and reiterated their commitment to developing an autonomous vehicle, work that would primarily be done in the US (Gardner 2016). If taken in isolation, the decision to shift small car production to Mexico could be seen as a huge loss for US workers and the US manufacturing sector more broadly. Yet that step freed up resources for the development of the next generation of battery-powered and driverless cars. As jobs were destroyed in the old production lines, new ones were created in the forward-looking models. The problem is that workers who used to assemble small cars may not have the skills needed to work on more technologically advanced battery-powered or driverless cars. This leads to unemployment and increased income inequality, at the same time that it creates new high-paying jobs.

It is also extremely difficult to sort out the effects of offshoring from other factors affecting employment, such as technology change, consumer demand, and the overall health of the economy. US manufacturing employment, as a share of total US employment, has been declining steadily since the 1950s, long before offshoring became a trend. Much of that decline has been due to technology change and a shift in consumption away from goods and towards services. At the same time, technological advancements have made it easier to offshore services as well as goods, leading to greater concerns among white collar workers. Measuring the offshoring of services presents its own problems, as they are less tangible than goods and thus harder to measure.

The following sections will review what we know about the various effects of different types of offshoring on different types of workers and try to paint a more complete picture of how those effects fit together to impact the overall economy. They will look at who is hurt by offshoring, and how big those costs are, as well as who benefits and how large those gains are. Conclusions will be drawn about the net effects on the US economy as well as distributional consequences and concerns for individual workers.

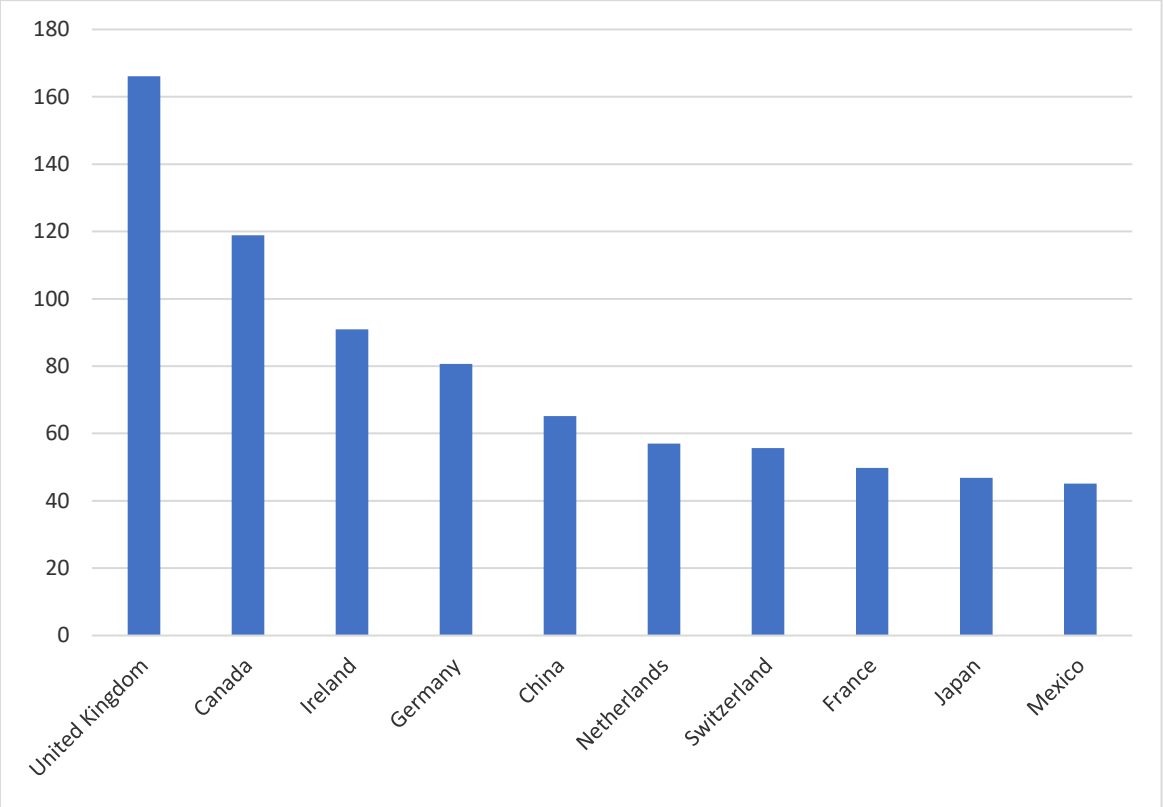
What, where, why, and how do firms offshore?

To understand the effects of offshoring on US workers, it is important to first understand where and how firms operate abroad.

Figure 1 shows the top ten locations for offshoring by US MNEs. Offshoring is measured using the value added by US-owned firms in each host country. This value-added measure is preferable to measures of financial flows, as it captures the actual economic activity performed by US firms in each country. Only two of the top ten destinations, Mexico and China, are developing countries and they only account for 14% of the total value added in the top ten offshoring locations. When US firms produce abroad, they are much more likely to do so in high-income countries than in low-income countries. This suggests that taking advantage of low wages is not the primary motivation for firms to produce abroad. Instead, firms consider a variety of factors including worker skills, local institutions, tax policy, proximity to global value chains, and the size of the local market.

In almost all cases, US MNEs sell at least some of what they produce abroad to customers in the host country. From 1987 to 2011, about 95 percent of foreign affiliates of US MNEs in the manufacturing sector sold some goods to the local market, and about 37 percent sold exclusively to their host market (Garetto, Oldenski, Ramondo 2019). In many cases, market-seeking motives are the primary reason for expanding internationally in the first place. In 2009 affiliates of US MNEs abroad accounted for 75 percent of US sales to foreign customers. It is likely that at least some of these sales would not have been made if US firms had not located close to their customers, as proximity to customers is necessary for the sale of many goods and services and motivates a large share of FDI by US firms (Oldenski 2012). In this case, foreign direct investment (FDI) may allow US firms to expand and gain market share relative to their foreign competitors, benefiting their US workers rather than substituting for them.

Figure 1: Top ten US foreign direct investment destinations in 2016 ($billions of value added)

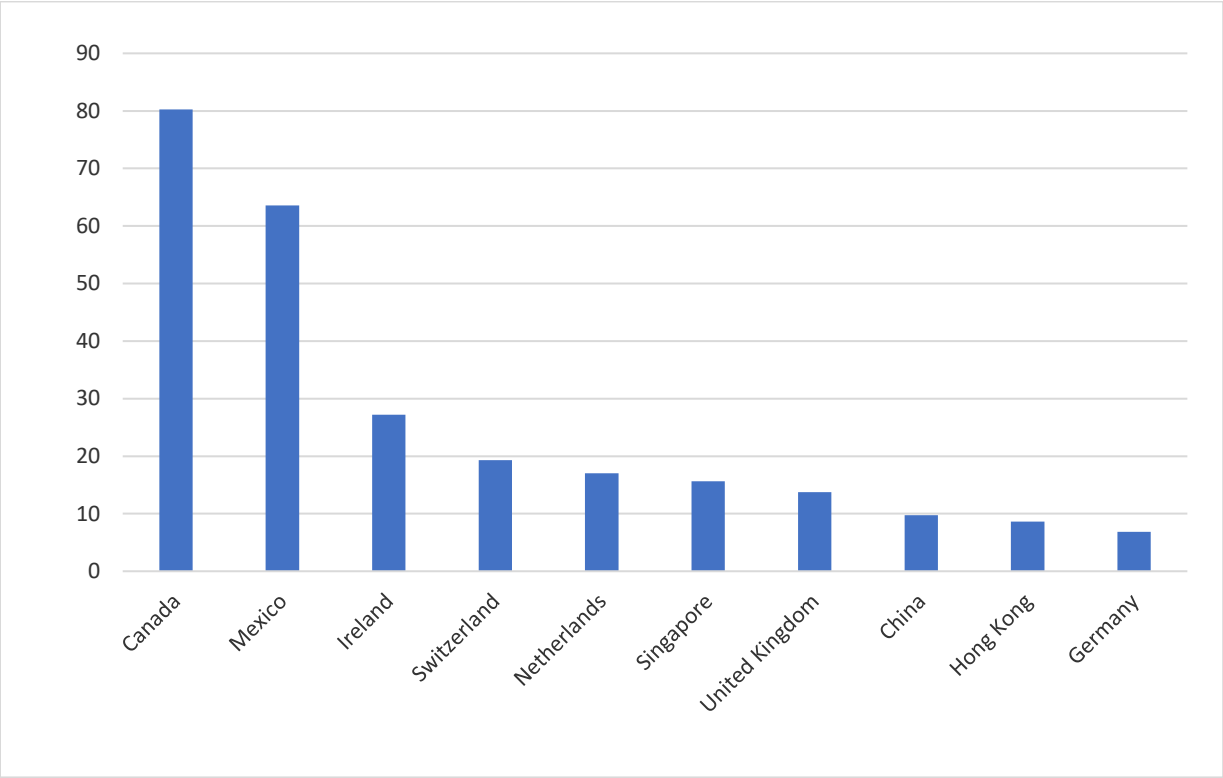


Source: Authors calculations based on data published by the US Bureau of Economic Analysis

Most MNEs do some combination of different types of FDI, including sourcing intermediate inputs and assembling goods to be consumed at home, as well as selling to local markets. However, when people discuss offshoring, it is often global sourcing and assembly that they have in mind. When firms expand to find customers, they may be more likely to do so to higher income countries where customers can afford to buy their goods and services. But offshoring that is done to cut the cost of production may be more likely to take place in low income countries, where workers earn much lower wages than in the US. To focus on this second motive, it is useful to consider only US MNEs that produce something abroad that is then shipped back to the US. Figure 2 shows the volumes of US imports from majority-owned affiliates of US firms in 2016 (the latest year for which data are available) for the top ten source countries. These represent goods that were produced abroad by US MNEs and then shipped to the US. Unfortunately, the data do not distinguish between imports that are sold to consumers in the US and imports of intermediates, which may have been used in the production of goods that could either be consumed in the US or eventually exported. However, this category does remove pure market-seeking FDI, and focuses on sales to the US (either US consumers or US firms). Even within this group, most of these within-firm imports are from other developed countries, with Mexico, China, and Hong Kong making up only 31% of within-firm imports from

the top ten countries. Again, this suggests that low wages are not the primary motivation for offshoring by US MNEs.

Figure 2: US imports from majority-owned foreign affiliates of US MNEs 2016 ($billions)



Source: Authors calculations based on data published by the US Bureau of Economic Analysis

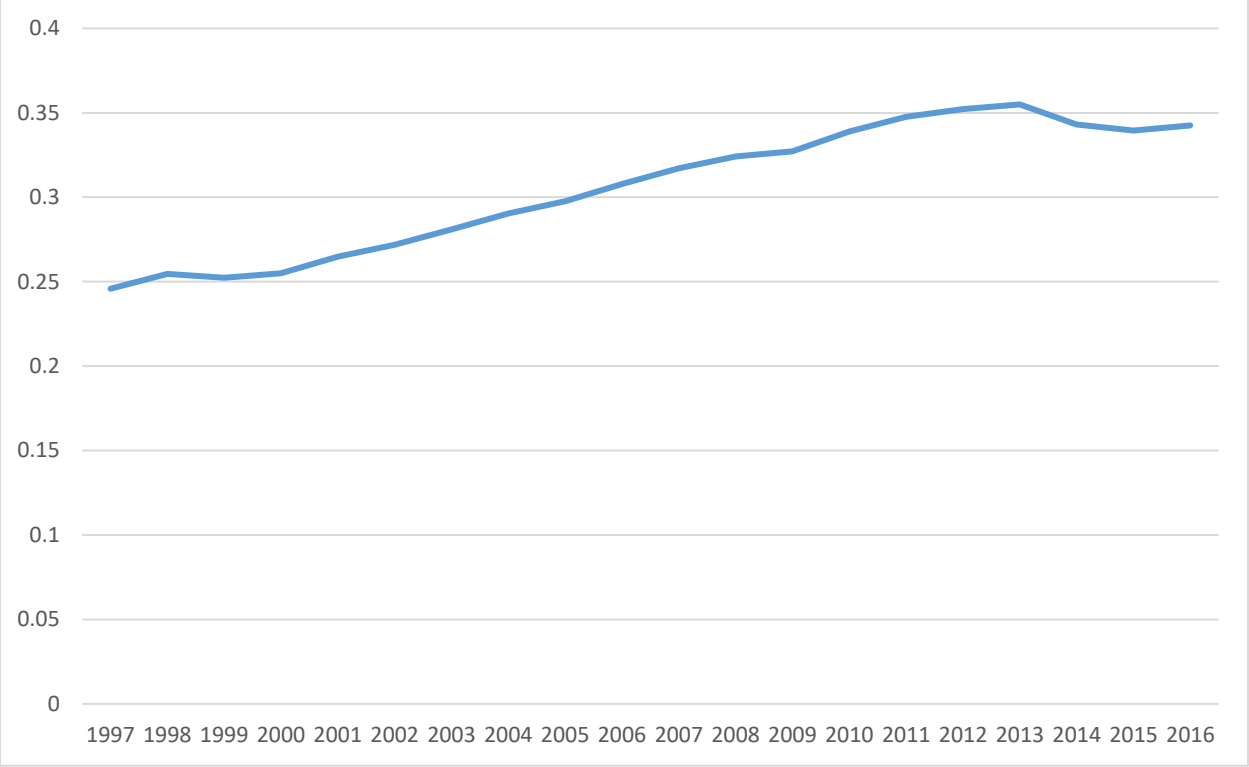
Even the most global firms do not offshore all of their production because, as studies show, to do so would be infeasible. Blinder and Krueger (2013) conducted a survey of US workers that asked them detailed questions about the nature of their jobs, then used that information to create an index of how feasible it would be to offshore each job. The authors used several approaches, including asking workers directly about the possibility of offshoring their job, hiring professional coders to create offshorability measures using characteristics of the job requirements, and creating an index themselves. All of these approaches concluded that about 25 percent of US jobs were offshorable, a number that is much higher than estimates from other studies. For example, Bardhan and Kroll (2003) conclude that about 11 percent of all US jobs are potentially offshorable by looking at data on sectors in which at least some offshoring has already taken place. Similarly, a McKinsey Global Institute study (2005) concluded that about 11 percent of service sector employment was technically capable of being offshored. Note that these estimates are all upper bounds, as they capture the share of jobs that *could* be offshored, not the share of jobs that will be offshored. These studies suggest that even when

US firms take advantage of offshoring opportunities, they still need to perform much of their work in the US for practical reasons relating to technology, the need for customer interaction, or legal restrictions. Moreover, as pointed out by Jensen and Kletzer (2008), referring to jobs that can be relocated across borders as "offshorable" misses the fact that many of these occupations are areas in which the US has comparative advantage. Many of the characteristics that are used to classify "offshorability" actually capture "tradability". Trade includes exports as well as imports, so some of the so-called "offshorable" products and may actually be exported by the US instead of offshored. Instead of a threat, the tradability of these jobs can present an opportunity for US workers, who can perform services and, to a lesser extent, produce goods for the rest of the world. Oldenski (2012) used data on the actual offshoring by US multinationals to characterize which types of goods and services US firms are more likely to produce in the US and which are more likely to be produced abroad. The results suggest that US MNEs move the most routine tasks to other countries, keeping jobs that require more complex skills, decision making, and communication in the US. This is in part because routine tasks are easier to separate from the firm's headquarters. But the US also has a comparative advantage in nonroutine tasks such as problem solving, creative thinking, and making decisions. These results are consistent with the findings of other studies, including Firpo, Fortin, and Lemieux (2011) and Ebenstein, Harrison, McMillan, and Phillips (2014), which use data for the US, as well as Baumgarten, Geishecker, and Görg (2013) and Becker, Ekholm, and Muendler (2013), which use data on Germany.

Changes in Offshoring over time

Some of the concerns over MNE offshoring stem from the perception that it has been increasing over time. Figure 3 shows that, indeed, the share of total employment by US MNEs that is located outside of the US has been increasing in recent decades, going from about 25% in 1997 to about 35% in 2016. The foreign employment share seems to have leveled off, or even decreased, between 2013 and 2016. This could mean that US MNEs began to do more work in the US relative to other countries in 2013-2016. But it is important to note that Figure 3 shows employment only *within* multinational companies. If firms are purchasing goods and services from contractors in other countries rather than making them in the majority-owned affiliates, then this could also show up as a decline in the share of MNE employment at foreign affiliates.

Figure 3: Share of US MNE employment located outside of the US



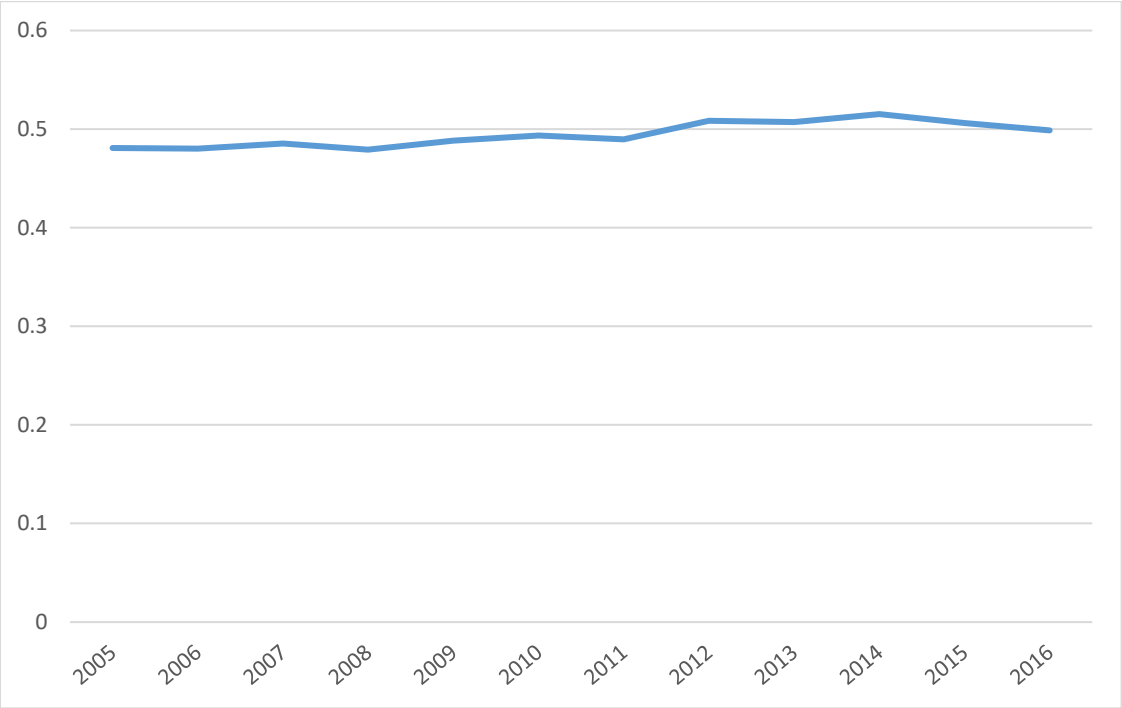
Source: Authors calculations based on data published by the US Bureau of Economic Analysis

The role of contracting and arm's length offshoring

Thus far the analysis in this chapter has focused on production within multinational firms. But firms may also contract out the provision of goods or services to unrelated companies. Unfortunately, it is extremely difficult to observe this arms-length offshoring in the data, as US firms are only required by law to report what they produce themselves. Information published by the US Census Department, however, is instructive on this issue.

The US Census Department publishes data breaking out the share of total imports that are shipped between related versus unrelated parties. This information, however, has some limitations. Although it includes unrelated party imports from offshore outsourcing purchases, a large portion of these trade flows are traditional imports that do not involve a multinational firm at all. In addition, the import data are only available for goods, and do not capture any offshoring of services. With these caveats, Figure 4 shows that related party imports (those that happen within multinational firms) have consistently made up about 50% of all US imports over the past decade. This pattern suggests that even given recent reports of firms using external contractors, production within MNEs is still extremely important. However, if it is becoming increasingly common for MNEs to contract out services, rather than goods, that had previously been done within firm, then the statistics presented in Figure 3 above may understate the extent to which foreign sourcing by MNEs is growing.

Figure 4: Share of US Imports that Occur Within Firms



Source: Authors calculations using data from the US Census Bureau Related Party Trade Database

Figure 4 suggests that offshoring within multinational firms has not declined as a share of total US imports, even with the option of external contracting. However, because it is difficult to measure the exact extent of outside contracting, it is possible that this type of offshoring is more widespread than the data suggest. From the perspective of workers, the important question is whether there is any reason to expect US workers to be affected differently by arms-length offshoring than by MNEs producing at affiliates abroad. Research on this topic suggests that workers would not be affected differently, as long as a US MNE is doing the offshoring. Evidence suggests that US workers at non-multinational firms are more negatively impacted by imports than workers at multinational firms (Kovak, Oldenski, and Sly 2019; Autor, Dorn, and Hanson 2013). This is because multinationals experience productivity gains from offshoring that allow them to expand domestically as well as internationally. Imports that consumers purchase from purely foreign firms do not have these benefits. When US workers perform tasks that are complementary to imported goods, most likely (but not necessarily) because the US firm doing the importing employs these workers, then imports can be beneficial. Consider a US electronics firm that hires engineers, project managers, and marketing employees in the US to design and sell their products, and may also produce some components in the US. If the firm is able to import some of their inputs or assemble their products abroad, then the cost savings from doing so may allow them to lower prices and sell more, leading to greater demand for workers in the US. What matters for the productivity

gains in this scenario is that the firm has a presence in the US, a location where Americans can be hired when gains from offshoring lead to expansion. These positive effects are likely to exist regardless of whether offshoring happens at arm's length or within the firm. The more negative effects materialize when there is no US presence to gain from the efficiency effects. Of course, in the case of imports, consumers gain from lower prices and firms that use the imports as inputs into their production are better off, but the employment effects are different than in the case of offshoring by MNEs.

Firm-level offshoring decisions

The information presented so far looks at aggregate trends in offshoring. But what about within individual firms? The US Bureau of Economic Analysis conducts annual surveys of all US-based multinational firms, and every five years conducts a more detailed benchmark survey. Column 1 of Table 1 shows the number of US MNEs that have expanded and contracted in the US and abroad between the two most recent benchmark survey years, 2009 and 2014.[1] Most US firms that expanded abroad also expanded in the US. Of the 1,345 US MNEs that increased their foreign employment between 2009 and 2014, 72 percent also increased their employment in the US. Firms that contracted abroad were also more likely to add workers in the US, but they did not expand in the US at the same rate as the firms that grew both at home and abroad. Of the 908 US MNEs that decreased their foreign employment between 2009 and 2014, 58 percent increased their employment in the US. This means that the firms that were most likely to hire more workers in the US were also the firms that hired more workers in other countries.

If you consider all 2,253 US multinational firms, the largest group is the one that expanded both at home and abroad, followed by firms that contracted abroad and expanded at home. In fact, more US firms have grown domestically while reducing their employment abroad than have added workers abroad while scaling back at home. Thus, the raw data show no systematic replacement of US jobs with foreign jobs.

Table 1 reports the number of firms with net employment gains and losses. In terms of magnitude, the median firm's growth was slightly higher in the US than abroad, and the rate of job loss was lower in the US than at foreign affiliates. Between 2009 and 2014, the median firm that expanded in the US had job growth of about 24% and the median foreign employment growth of firms that expanded abroad was 23%.[2] For firms with net job losses, those numbers

[1] The findings presented in table 1 are based on the statistical analysis of firm-level data on US multinational companies at the Bureau of Economic Analysis, US Department of Commerce under arrangements that maintain legal confidentiality requirements. The views expressed are those of the authors and do not reflect official positions of the US Department of Commerce.

[2] To avoid disclosing values for individual firms, reported medians average the values of the nine firms around the median.

were a 14% reduction in the US and a 23% reduction abroad. However, there were some large firms that had much greater gains and losses, as the average employment changes were much larger than the medians. The average firm that expanded in the US had employment growth of 31% while the average growth abroad was 52%. Average losses in the US were 23% and average losses abroad were 32%.

The patterns described above focus on changes from 2009 to 2014 because they are the two most recent benchmark survey years. But using 2009 as a comparison year may be problematic because of the great recession. For that reason, column 2 of Table 1 reports the same figures for 2010-2015. The pattern is very similar. Column 3 of Table 1 considers changes from 2004 to 2014. Even when the recession years are included in the middle of the sample, the largest category of firms is still those that increase both in the US and abroad. The main difference between the 2004-2014 period and the post-recession years is that firms that contracted abroad between 2004 and 2014 were more likely to also contract in the US.

Columns 4 and 5 of Table 1 break down the results by manufacturing and non-manufacturing (service) firms. The patterns are very similar across these two sectors, with service firms exhibiting a slightly higher correlation of hiring patterns in the US and abroad.

Table 1: Number of firms that increased and decreased their US and foreign employment

	1	2	3	4	5
	2009-2014	2010-2015	2004-2014	2009-2014	2009-2014
				Manufacturing	Services
Firms that expanded abroad					
… and expanded in the US	974 (72%)	959 (73%)	704 (67%)	499 (71%)	475 (74%)
… and contracted in the US	371 (28%)	360 (27%)	354 (33%)	200 (29%)	171 (26%)
Firms that contracted abroad					
… and expanded in the US	524 (58%)	512 (58%)	293 (47%)	298 (60%)	226 (55%)
… and contracted in the US	384 (42%)	372 (42%)	336 (53%)	200 (40%)	184 (45%)

Note: This table was constructed using firm-level data on US multinational companies at the Bureau of Economic Analysis, US Department of Commerce under arrangements that maintain legal confidentiality requirements. The views expressed are those of the authors and do not reflect official positions of the US Department of Commerce.

Effects of offshoring on domestic workers

Sorting out the effects of offshoring on domestic workers is extremely difficult, given the many forces other than offshoring that may lead workers to lose their jobs. This section reviews the data sources and methodologies that have been used to identify the winners and losers from

offshoring, and describes what is known about the magnitude of the effects of offshoring on various types of workers. While some individual workers may be badly hurt by offshoring, the likelihood of this happening to any given worker is relatively low, and the gains to workers who benefit from offshoring are high. Worker training programs have been shown to mitigate the negative effects, but have not been widely implemented in the US.

Using Trade Adjustment Assistance data to identify and assist displaced workers

As mentioned in the introduction, it is much easier to observe the workers who are hurt by offshoring relative to those who gain. However, even that has its challenges. If a plant closes, it can be difficult to distinguish what role was played by offshoring relative to other factors, such as technology, demand, or the overall health of the firm. One approach is to focus on firms and workers that qualify for Trade Adjustment Assistance (TAA). TAA is a US government program that offers assistance to those who are hurt by trade and offshoring. To become certified to receive such assistance, a group of three or more workers, a company official, or a union representative must submit a petition to the Department of Labor (DOL), which then verifies the role of trade in the job dislocation. While some unions, such as the United Steelworkers, publicize and coordinate the process for their members[3], as of 2011 two-thirds of TAA participants were not union members (Solis and Kirk 2011). For a petition to be approved, it must be the case that workers were harmed either by increased imports or because their firm has shifted production or services to a foreign country. If approved, individual workers covered by the petition may apply for benefits. In 2009, 42% of certified petitions were due to a shift in production abroad, rather than import competition (DOL 2009). Benefits include subsidized training; career counseling; job search and reallocation allowances; income support for training participants; and wage insurance for workers over 50 years of age. From 2007 to 2012, about 2,464 TAA petitions were filed each year, covering an average of 158,280 workers per year. Of these, about two-thirds were certified as eligible for TAA by the Department of Labor. However, less than 40 percent of certified workers end up participating in the TAA programs. Thus, a total of about 375,493 US workers received TAA benefits during the six-year period from 2007 and 2012. (Cimino-Isaacs and Hufbauer 2015). This is an extremely small number, especially compared to the total US jobs that are destroyed and created on a regular basis for reasons other than trade. For example, from September 2018 to December 2018, the US lost a total of 6.9 million jobs from closing and contracting private-sector establishments. Over the same period, gross job gains from opening and expanding private-sector establishments were 7.7 million, resulting in a net employment gain of 814,000 jobs in the private sector during the fourth quarter of 2018 (US Bureau of Labor Statistics 2019). TAA certified individuals make up a very small share of total laid off workers.

Table 2 shows the distribution of TAA petitions filed and approved by state in fiscal year 2017. These petitions were distributed more or less evenly with state population, showing

[3] https://www.usw.org/members/laid-off-members/trade-adjustment-assistance-services

surprisingly little geographic concentration. Only three states (Alaska, Delaware, and Wyoming) did not file any petitions in 2017.

Table 2: Trade Adjustment Assistance Petitions Filed and Approved by State, FY 2017

State	Petitions Filed	Petitions Certified	Est. # of Workers	State	Petitions Filed	Petitions Certified	Est. # of Workers
Alabama	1	4	1,627	Nebraska	11	9	578
Alaska	0	1	13	Nevada	2	1	8
Arizona	12	9	2,294	New Hampshire	5	2	40
Arkansas	13	10	502	New Jersey	35	29	1,567
California	114	91	12,338	New Mexico	3	3	1,842
Colorado	19	18	2,073	New York	85	59	3,065
Connecticut	20	17	949	North Carolina	23	20	3,472
Delaware	0	0	0	North Dakota	1	0	0
DC	1	0	0	Ohio	35	21	3,934
Florida	17	15	1,333	Oklahoma	15	21	2,312
Georgia	11	7	1,334	Oregon	73	58	3,949
Hawaii	1	1	13	Pennsylvania	94	72	4,219
Idaho	7	4	788	Puerto Rico	3	3	299
Illinois	44	35	2,830	Rhode Island	3	1	263
Indiana	14	12	1,416	South Carolina	21	17	2,291
Iowa	4	8	1,196	South Dakota	2	3	321
Kansas	21	17	936	Tennessee	17	16	3,653
Kentucky	11	15	1,143	Texas	80	63	5,501
Louisiana	1	3	397	Utah	7	6	535
Maine	5	7	351	Vermont	5	4	90
Maryland	8	4	411	Virginia	10	8	1,170
Massachusetts	36	31	2,870	Washington	30	23	7,416
Michigan	43	26	7,135	West Virginia	3	7	593
Minnesota	27	22	1,444	Wisconsin	22	18	1,050
Mississippi	2	2	387	Wyoming	0	0	0
Missouri	15	13	1,552	**Total**	**1,037**	**844**	**94,017**
Montana	5	8	517				

Source: US Department of Labor

TAA certified individuals are not likely to be representative of all workers affected by trade for several reasons. First, only workers who lose their jobs as a result of trade or offshoring have an incentive to apply, so the statistics do not capture workers who were positively affected by offshoring. Second, of that subset of laid-off workers, those who are quickly reemployed have no incentive to apply. Finally, the TAA numbers likely miss many workers who are hurt by trade or offshoring but do not apply for benefits because of lack of information about the program on the part of workers or lack of incentive to apply on the part of their employers. Despite these

caveats, it can still be useful to study workers who qualify for TAA, as it provides information on the consequences of offshoring for a specific group that can be easily identified as being negatively affected by offshoring.

Monarch, Park, and Sivadasan (2017) look at about 1000 firms that were certified as offshorers through the TAA program between 1999 and 2006. The authors were not able to follow the outcomes for individual workers, but instead looked at what happens to the firms. Firms whose workers receive TAA benefits due to offshoring of production experience overall declines in US employment, and their employment remains lower than that of similar non-offshoring firms up to six years after the initial offshoring occurred. After six years, the TAA firms are more capital and skilled labor intensive than their peers, though there is no change in average wages for either production or nonproduction workers. Firms that have been certified as offshorers through TAA are also more likely to shut down over the following 3 to 5 years. This suggests that offshoring can have lasting negative consequences for some workers and firms.

These results are in stark contrast to the results for all multinational firms presented in Table 1, which show that 72% of firms that increase their offshore employment also increase their domestic employment. They also differ from other empirical studies, such as Sethupathy (2013), which examines offshoring by US firms in Mexico, and finds an increase in wages and no US job losses at the offshoring firms. This contradiction is most likely because firms that qualify for TAA assistance are the ones who are most negatively affected by offshoring. Employees of firms that offshore but also create more jobs in the US have no need to apply for government assistance. However, the existence of the TAA firms and the evidence of their negative outcomes suggests that there is a great deal of heterogeneity in the way workers are affected by offshoring. If a worker is fortunate enough to be employed by a growing firm, even one that does a considerable amount of offshoring, then that worker may be sheltered from the negative effects of offshoring. But, if a worker is employed by one of the less dynamic or shrinking firms, such as those that are eligible for TAA benefits, then they are worse off as a result of their firm's offshoring. Even though the results in Table 1 show an overall positive correlation between expansion at home and expansion abroad, they also suggest that about 28% of firms that expand abroad reduce their employment in the US.

It is also useful to look at what happens to displaced TAA workers after they lose their jobs to offshoring. The Department of Labor publishes annual reports of the uptake and outcomes of TAA programs. According to official DOL data, from October 1, 2016 to September 30, 2017, an estimated 94,017 workers became eligible for TAA benefits and 43,615 participants received these benefits. Over 63 percent of individuals that participated in TAA programs received job training, and over 89 percent of those who completed training received a credential. Performance among TAA recipients was high, with 75 percent of TAA participants obtaining new employment within 6 months of completing the program. Over 71 percent of participants who exited the program were re-employed in non-manufacturing industries (DOL 2017). Table 3 provides more detail on the employment outcomes of workers who participated in TAA training programs between 2013 and 2017. In each of these years, more than 70% of the

workers who completed TAA training were employed within 3 months of exiting the program. Of these, more than 90% were still employed six months later.

Table 3: Trade Adjustment Assistance (TAA) worker training outcomes

Fiscal Year	Employed in the first quarter after training[1]	Still employed after 6 months[2]	Average earnings in the first 6 months[3]
2013	71.60%	91.70%	$18,104
2014	72.40%	91.40%	$17,857
2015	74.10%	92.40%	$17,910
2016	74.30%	92.20%	$18,750
2017	72.90%	90.90%	$19,129

Source: https://www.doleta.gov/tradeact/docs/AnnualReport17.pdf
Notes:
1 Percentage of TAA participants who were employed in the first quarter after exit as reported in the third quarter after exit.
2 Percentage of TAA participants employed in the first quarter after exit who are still employed in the third quarter after exit. This six-month retention rate is based on data collected five quarters after exit to allow for time to collect and report data.
3 Average (mean) earnings for TAA participants in the 2nd and 3rd quarters after exit. These earnings are based on data collected five quarters after exit to allow for time to collect and report data.

Taken together, these data suggest that there are large negative consequences for some workers as a result of offshoring, but that trade adjustment assistance can be a potentially effective way of helping these workers find employment. Unfortunately, the DOL only publishes data on employment rates and average incomes after the training programs, but not on the wages of participants before losing their jobs to offshoring. It is possible that displaced workers are earning less than they were before the offshoring and retraining occurred. In a study of Connecticut workers affected by mass layoffs for reasons not directly related to offshoring, Couch and Placzek (2010) estimate that some laid off workers experienced wage reductions that were initially more than 30 percent and as much as 15 percent after six years. That study considers workers who were laid off for reasons other than offshoring, but it is possible that there could be similar wage effects for workers who lost their jobs because their firms shifted production to another country.

Recent research by Ben Hyman (2018) combines worker-level data from the US Census Bureau with data on all TAA petitions filed with the US Department of Labor (DOL). These data track approximately 300,000 displaced workers as they move in and out of unemployment status and across employers of diverse industries and regions, both before and after their initial job separation to measure the effects of the TAA program on displaced workers. To avoid the problem of selection into TAA programs, this study uses the fact that some TAA case

investigators are more or less likely to approve petitions. If assigned to more lenient investigators, displaced workers have a higher likelihood of receiving TAA benefits, for reasons not related to their own work experience. The results suggest that workers who undergo TAA training give up about $10,000 in income while training, yet ten years later have approximately $50,000 higher cumulative earnings relative to similar workers who do not retrain. About 33% of these returns are driven by higher wages, which suggests that the benefits to TAA-trained workers do not only come through greater labor force participation or higher priority in hiring. Rather, TAA workers also appear to be paid a premium for their newly acquired human capital. Again, these workers make up only a small share of those potentially affected by offshoring, but the results do suggest that TAA training can be a valuable tool for helping this group of workers.

Are foreign workers substitutes for US workers?

Another important question to ask when trying to understand how vulnerable US workers are to competition from offshoring is whether foreign workers can be easily substituted for US workers. If a foreign worker can perform a job as well as a worker in the US, then why wouldn't firms locate production where wages are lower? But it is also possible that US workers have unique skills and experience which makes them difficult to replace with foreign workers. Assessing how similar workers are across countries can be challenging. Many of the important differences between workers cannot be summed up by simple statistics like years of schooling or work experience. To address this, some researchers use multinational firm cost functions to estimate the elasticity of substitution between domestic and foreign workers. This approach explicitly holds firm output fixed to isolate substitution effects, so it cannot capture the overall effects of offshoring. But it is useful for estimating the extent to which domestic and foreign workers can be used to produce the same level of output. This approach generally looks at how responsive firms' offshoring decisions are when foreign wages fall. The results are mixed. Slaughter (2000) finds that offshoring by US firms to low-wage countries has no detectable impact on their US employment. Harrison and McMillan (2011) find that offshoring to low wage countries substitutes for domestic employment, but for firms that perform very different tasks at home than abroad, foreign and domestic employment are complements. A number of other studies have looked at offshoring by European firms to low wage countries and found little or no substitution (Braconier and Ekholm (2000), Konings and Murphy (2006) and Marin (2004)). Some firm-level studies have found that wages or per-capita incomes are not significant predictors of where MNEs decide to locate their production in the first place (Devereux and Griffith (1998); Buch, Kleinert, Lipponer and Toubal (2005)). Other studies, however, have found low wages to be a significant predictor of offshoring location choice (Disdier and Mayer (2004); Becker, Ekholm, Jackle and Muendler (2005)). Muendler and Becker (2010) point out that there may be bias in studies that only look at changes within existing offshorers, without controlling for location selection, or that only consider one potential offshoring destination at a time. They use data on German multinationals and find that foreign and domestic labor are substitutes at both the extensive margin (when firms open new affiliates) and the intensive margin (when firms expand their existing operations in other countries). However, they find evidence of intensive margin substitution only for other

European countries, but not for developed or developing countries outside of Europe. And even the effects within Europe are small. A one-percent reduction in the wage in central and eastern Europe, for instance, is associated with a 0.03 percent drop in home employment at German MNE parents. As mentioned above, all of these papers are looking at the technical substitutability of workers across countries. To accomplish this, they must hold output fixed. This means that they do not allow for any increases in the size of the firm that are enabled by the cost savings that result from offshoring. In other words, what they capture is not the overall effect of offshoring – including the positive productivity effects as well as the negative substitution effects-- but instead they ask a more technical question about the extent to which domestic and foreign workers can be substituted for each other in production. Even with that caveat, the available evidence suggests that there is not a high degree of substitutability between domestic and foreign workers.

Of course, some jobs are easier to perform abroad than others. As a result, offshoring does not affect all workers in the same way, with effects varying based on a number of different dimensions. In general, high skilled workers are most likely to gain from offshoring, and low skilled workers are most likely to be made worse off. This has been shown to be the case for both employment (Crino 2010) and wages (Baumgarten, Geishecker, and Görg 2013; Hummels, Jorgensen, Munch, and Xiang 2014). The effects also depend on the country in which the offshoring takes place. Negative effects on US workers are more likely to materialize when offshoring takes place in low income countries. But these negative effects are small, as developing countries are more likely to compete with each other for offshoring jobs than they are to compete with US workers (Brainard and Riker 1997). For firms that perform significantly different tasks at home and abroad, foreign and domestic employment are complements (Harrison and McMillan 2011). This is due in part to the fact that the US has a comparative advantage in higher skilled jobs and occupational tasks. It is also because some jobs are simply more difficult to perform abroad because they require communication with US customers or management, or because they are simply too complex for a firm to trust to workers in another country (Oldenski 2012).

Quantifying the negative effects of offshoring

How large are the effects of offshoring on vulnerable workers? The negative effects of offshoring are generally small, even for groups of workers who are most likely to be negatively affected. For low wage workers, a 10 percent increase in offshoring leads to an average wage decrease of 0.22% (Hummels, Jorgensen, Munch, and Xiang 2014) to 0.40% (Ebenstein, Harrison, McMillan, and Phillips 2014). Liu and Trefler (2011) find that the probability of switching to a lower-wage occupation increases by about 0.039%. Offshoring has been found to increase the unemployment risk of low-skilled workers, but the quantitative impact is modest. Munch (2010) estimated the employment effects of offshoring using Danish data and found, for example, that a 30-39 year old male with only a high school education experienced an increase in the risk of unemployment from 26.1 to 27.1 percent over the 1991 to 2002 period when outsourcing by Danish firms increased by 2.7 percentage points. These results

suggest that while the potential effects on an individual worker may be large (e.g. the loss of a job), the odds of any given low skilled worker being negatively affected are low enough to make the aggregate effects quite small. There is ample evidence that low skilled workers, and manufacturing workers in particular, have experienced widespread job loss and wage declines in the US (see, for example, Fort, Pierce, and Schott 2018). But there is little evidence relating these losses to offshoring, suggesting that other factors, such as technology, changes in demand, and import competition, may be much larger factors.

Quantifying the positive effects of offshoring

Much less is known about those who gain from offshoring. This is in part because job gains are generally not as concentrated as losses. It is also much more difficult to establish a causal relationship between offshoring and job creation. One reason is that the gains are often in different industries, different geographic locations, or even different firms relative to where the initial offshoring took place. Consider Apple. It offshores the production and assembly of most of the components for its smartphones and tablets. Yet doing so allows the firm to sell more products, which creates jobs in the US from engineers in Silicon Valley to Apple Store clerks in the Midwest. On its website, Apple claims to be responsible for creating 2,000,000 jobs in the US. This includes 80,000 Apple employees, 450,000 jobs through their US-based suppliers, and 1,530,000 U.S. jobs "attributable to the App Store ecosystem".[4] These jobs are spread over all 50 states. Apple employment outside of California is 28 times higher in 2019 than it was in 2000. The problem is that it is difficult to know the counterfactual, in other words, how many Apple-related workers would be employed in the US if Apple was not able to offshore production. It is possible that Apple might employ even more workers in the US if it no longer produced its components abroad. It is also possible that without the ability to offshore, Apple would not be the highly successful company that it is today, and that could cost jobs in the US. One thing that is clear, however, is that Apple is responsible for a large number of US jobs-- 80,000 of them direct employees of the firm-- even with a substantial amount of its production located abroad.

Despite the difficulties of establishing causality, several studies have managed to address this problem by studying exogenous decreases in the cost of offshoring, that is, factors that affect firm's decisions to offshore, but are not a result of decisions made by the firms themselves. These studies have generally found positive effects of offshoring on some US workers. Offshoring does not mean simply shifting production abroad. Instead, when firms offshore they also increase their production in the US and we observe greater output (Wright 2014) and greater employment (Desai Foley, and Hines 2009; Criscuolo and Garicano 2010; Kovak, Oldenski, and Sly 2019) as a result. These effects do not change the fact that some workers lose their jobs, but they do suggest that offshoring brings strong positive effects to the US economy and some US workers, and is not a purely negative shock.

[4] https://www.apple.com/job-creation/

As shown in Table 1, firms that expand abroad tend to expand in the US at the same time. This is generally good news for workers. But it does not tell us much about the causal effects of offshoring on US employment. It could just be that productive, growing firms hire more workers in all of their locations, and that the offshoring has no direct effect on hiring abroad. It is also possible that the sign of the relationship is reversed, and that even though we see firms expanding simultaneously in the US and abroad, they would have actually hired more workers in the US if offshoring had not been an option. It is extremely difficult to sort out the causal relationship between offshoring and domestic employment because firms make decisions about both of these things simultaneously based on their own productivity and other characteristics. Kovak, Oldenski, and Sly (2019) address this problem by looking at an exogenous shock to the cost of offshoring, in the form of bilateral tax treaties (BTTs). These treaties, which are signed between the US and other countries, lower the cost of offshoring by US multinational firms, yet they are not correlated with the firms' productivity or other characteristics. Thus it is possible to see what happens to the domestic US employment of firms that already have an affiliate in a treaty country after the treaty reduces the cost of offshoring for those firms. The results suggest that a reduction in the cost of offshoring helps employees of multinational firms in the US. A 10 percent increase in affiliate employment drives a 1.8 percent increase in employment at the US parent firm. However, these gains are mostly offset by losses to workers at other, non-MNE firms in the US. At the industry level, a 10 percent BTT-induced increase in affiliate employment only leads to a 0.14 percent increase in US domestic employment.

Who wins and loses?

So what determines who wins and who loses as a result of offshoring? Workers at MNEs are more likely to gain than workers at non-MNEs. As mentioned above, workers who are likely to be hurt the most are those with less education (Hummels, Jorgensen, Munch, and Xiang 2014), who perform routine tasks (Ebenstein, Harrison, McMillan, and Phillips 2014; Hummels, Jorgensen, Munch, and Xiang 2014; Ottaviano, Peri, and Wright 2013; and Oldenski 2012), and who work in industries that offshore more to low income countries (Ebenstein, Harrison, McMillan, and Phillips 2014). Yet these losses are often offset by gains to workers with more education or that perform nonroutine tasks. Hummels, Jorgensen, Munch, and Xiang (2014) use data on offshoring by Danish firms and find that offshoring lowers the wages of low skilled workers and raises the wages of high skilled workers, while exporting increases the wages of both high and low skilled workers. They find that if a firm doubles its offshoring, the average low-skilled worker incurs a loss of 4.2 percent of their pre-offshoring earnings over the next five years. This loss includes any wage changes in their current job, wage changes in new jobs, and losses due to time spent in unemployment. In contrast, the average high-skilled worker gains 4.9 percent of their pre-offshoring earnings. Because higher earners gain and lower earners lose, offshoring can have an effect on income inequality. Oldenski (2014) uses firm-level data on offshoring paired with occupation-level data on employment and wages to estimate the impact that offshoring has had on US workers from 2002 to 2008. The results suggest that offshoring by US firms has contributed to relative gains for the most highly skilled works and

relative losses for middle skilled workers. An increase in offshoring in an industry is associated with an increase in the wage gap between workers at the 75th percentile and workers with median earnings in that industry, and with a decrease in the gap between workers earning the median wages and those at the 25th percentile. This pattern can be explained by the tasks performed by workers. Offshoring is associated with a decrease in wages for occupations that rely heavily on routine tasks and an increase in wages if the occupation is nonroutine and communication task intensive. Workers who perform routine tasks tend to be in the middle or bottom of the wage distribution, while workers who perform nonrountine and communication-intensive tasks are more likely to be in high paying jobs.

In aggregate, there are gains at US MNEs that offshore, albeit with much churning and distributional consequences. Given the presence of both gains and losses, the most relevant policy question is whether it is possible to mitigate the losses from offshoring, without forgoing the benefits. The available evidence suggests that worker training programs may be effective at achieving this goal.

Much of the research on the labor market effects of offshoring focus on US multinationals. However, research using data on firms from other countries suggests that the effects are likely similar, at least across other developed countries. The labor market effects of offshoring by firms from less developed countries has not been studied in much detail, in large part due to lack of sufficiently detailed data on firms from these countries, and thus remains an open question.

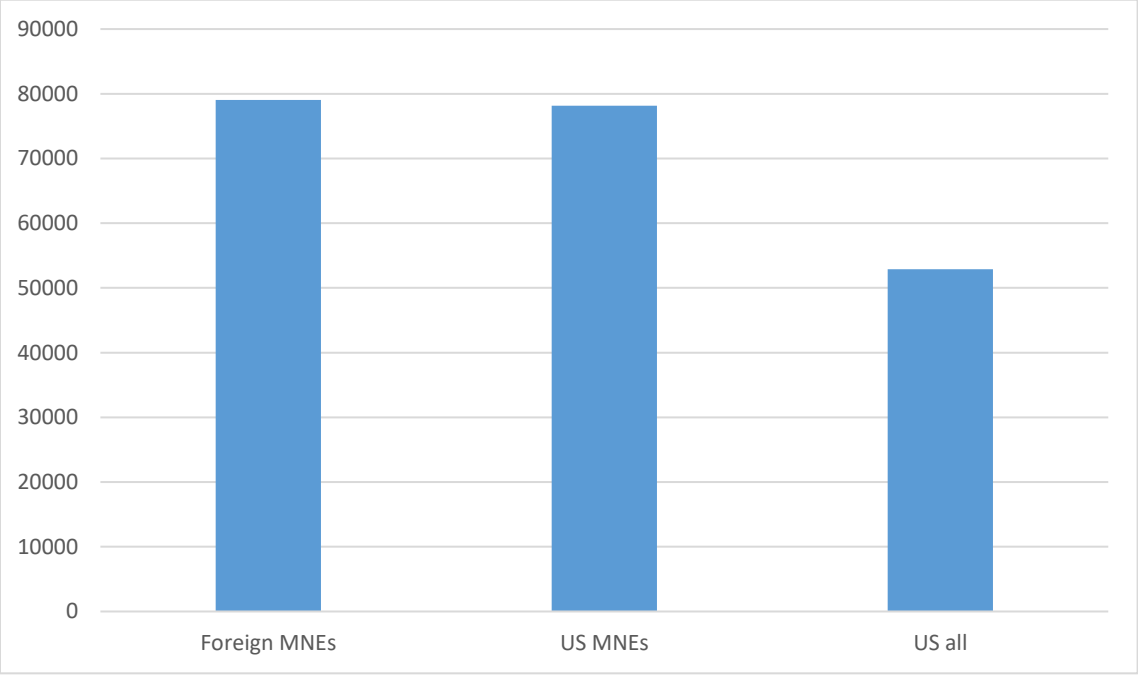
Effects of foreign MNEs on domestic workers

US workers are not only affected by the actions of US-owned MNEs. They are also affected by foreign-owned multinationals in the US. As multinational production expands globally, this implies not only that US firms will expand abroad, but also that foreign firms will increasingly perform more work in the US. From the perspective of US workers, this is a good thing, as it creates jobs in the US.

In 2016, more than 7.6 million US workers were employed by affiliates foreign-owned multinational firms in the US. As shown in Figure 5, these Foreign investors in the US pay on average higher wages than US employers. They even pay higher wages than US multinationals, which are among the highest paying of all US firms. This should not be surprising. First, multinational firms are the largest and most productive of all firms, and are known to pay higher wages than purely domestic firms, resulting in a multinational wage premium. Second, when foreign firms locate in the US, they are not doing it to take advantage of low wages. Instead, they are drawn by the highly skilled workforce, culture of innovation, and large consumer market, implying a selection effect in which foreign firms create jobs that require higher skills than the average US firm. Setzler and Tintelnot (2019) are able to separate the

relative contributions of the MNE premium and worker composition by studying workers who move between foreign and domestic firms. They find that the typical worker earns 7 percent more at the average foreign firm relative to the average domestic firm. In their aggregate data, foreign firms pay 25 percent higher average wages than domestic firms, after controlling for industry and location. Together, these results suggest that most of the foreign firm wage differential can be attributed to the types of workers they hire, but there is also a substantial foreign firm premium for a given worker. The wage premium paid by foreign multinationals is quite large in the aggregate—accounting for a total of $34 billion annually in wages.

Figure 5: Average Annual Compensation of US workers in 2015



Source: Authors calculations based on data published by the US Bureau of Economic Analysis
Note: Average annual compensation of workers is the cost to the firm of employing workers, including wages and benefits.

In addition to creating high paying jobs, foreign firms may also have indirect effects on domestic firms. When foreign firms enter a market, they bring with them new production technologies and management practices that can spillover to the local market. These FDI spillovers can take the form of horizontal technology transfers from foreign to domestic firms in the same industry. For example, workers may leave the foreign owned firm and take the techniques that they have learned with them to their next job in a domestic firm. Domestic firms may also learn by observing their competitors. Spillovers may also be vertical. For example, if foreign-owned firms wish to source inputs locally, they may demand higher quality or even share production technology with their suppliers, resulting in greater productivity of

local firms in upstream industries. Research on multinational spillovers initially focused on the presence of developed country firms in less developed markets.[5] This is the situation in which the gap between the technology level of the firm's headquarters location and the host country is the greatest, and thus the potential for gains may be the highest. However, several studies have also found evidence of positive spillovers from FDI in developed countries.[6] For example, Moran and Oldenski (2013) found that a 1 percentage point increase in the share of total employees in an industry who work at foreign-owned firms in the US increases the productivity of all firms in the industry by an average of 0.81 percent after one year and by 2.75 percent in the second year, or a total of more than 3.5 percent. These numbers imply that that productivity spillovers from FDI alone are responsible for US TFP growth of about 3 percent from 1987 to 2007.[7] This 3 percent is more than one-tenth of the 25 percent US TFP growth over that period. In other words, about 12 percent of the total productivity growth in the US from 1987 to 2007 can be attributed to productivity spillovers from inward FDI. Setzler and Tintelnot (2019) find that an increase in employment at foreign-owned firms significantly raises value added, employment, and wage bill at domestically owned firms in the same commuting zone. Their estimates imply that, for every 1 job created by a foreign multinational, approximately 0.42 jobs and $91,000 in value added are generated by domestic firms in the same local labor market. Their combined estimates of the direct and indirect effects imply that one additional job created by a foreign multinational generates, on average, annual aggregate wage gains for local workers of approximately $16,000, two thirds of which is due to the indirect effects. This has important implications for workers as the expansion of both foreign and domestic firms can lead to job creation in the US.

Summary: What propositions on offshoring are supported by research?

To summarize the results described in this chapter, some conventional wisdom on offshoring is supported by careful research, but some is not. The proposition that foreign workers can be easily substituted for domestic workers only has limited support, suggesting that US and foreign workers are at most imperfect substitutes, and that substitution is more likely between similar countries. There is also no evidence of widespread replacement of US jobs with foreign jobs. However, research has shown that the effects of offshoring are heterogenous, that is, offshoring has very different effects on different workers. Employees of multinational firms and more highly skilled workers are more likely to benefit from offshoring, while less skilled workers and those at purely domestic firms are more likely to be worse off. Trade adjustment assistance (TAA) in the US has been relatively limited, but research on TAA suggests that it can

[5] For example, evidence of positive spillover effects from FDI have been found for Mexico (Blomström 1986 and Kokko 1994), Mauritius (Rhee, Katterback and Whie 1990), Malaysia (Rasiah 1995, Canpanelli 1997), Indonesia (Blomström and Sjoholm 1999, Blalock and Gertler 2005 and 2008), Lithuania (Javorcik 2004), Ghana (Gorg and Strobl 2005), and Thailand (Kohpaiboon 2007 and 2009).

[6] Branstetter (2006); Haskel, Pereira and Slaughter (2007); Keller and Yeaple (2009); Moran and Oldenski (2013)

[7] From 1987 to 2007, employment at foreign-owned firms as a share of total US employment grew from about 3.8 to 4.6 percent (a 0.8 percentage point increase). That implies that productivity spillovers from FDI are responsible for US TFP growth of about 3 percent (0.008*(0.81+2.75)).

be an effective way of helping displaced workers, especially through the use of job training programs.

Conclusions

The answer to the question "Do multinational firms export jobs?" is a definite "Yes". However, they also import jobs, and in many cases, offshoring enables that job creation at home. Overall, the net effect of MNE offshoring on domestic jobs and wages is close to zero or possibly a small positive. But that net effect masks the fact that some workers are hurt by offshoring while others gain. In general, less educated workers and those who perform routine tasks are more likely to experience job losses and reduced wages as a result of offshoring, while more highly educated workers gain. Evidence suggests that Trade Adjustment Assistance (TAA), particularly in the form of worker training, can help mitigate some of the negative effects of offshoring without sacrificing the benefits.

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