

Offshoring and the migration of jobs

Offshoring has little net effect on domestic employment, while pushing domestic workers toward more complex jobs

Keywords: offshoring, employment, tasks, skills

ELEVATOR PITCH

The impact of offshoring on domestic jobs is more complicated than it first appears. In the standard narrative, offshoring production is thought to harm domestic workers by providing cheap alternative sources of labor. However, while offshoring may directly displace domestic workers, the resulting foreign market access and lower production costs allow domestic firms to increase efficiency, expand production, and thus create new jobs for domestic workers. These new jobs often involve more complex tasks, as revealed by the positive relation between the share of offshored jobs and the average cognitive and interactive task content of domestic jobs.

KEY FINDINGS

Pros

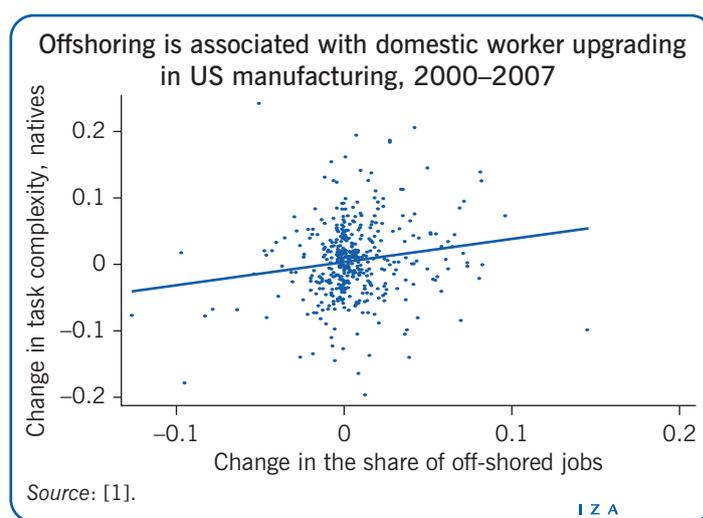
- ⊕ Offshoring gives domestic firms access to foreign markets and reduces production costs.
- ⊕ Foreign market access and lower production costs allow domestic firms to increase efficiency, expand production, and thus create new jobs for domestic workers.
- ⊕ As offshored jobs are typically less intensive in communication and cognitive skills than tasks that remain domestic, offshoring leads to task upgrading for domestic workers.
- ⊕ The net employment effect of offshoring for domestic workers is limited.

Cons

- ⊖ Job creation abroad through offshoring may come with job destruction at home.
- ⊖ For offshoring to have a positive effect on domestic employment, the efficiency gains it generates must be large enough to adequately boost the overall number of jobs.
- ⊖ Whether the increase in the overall number of jobs is large enough remains inconclusive because of data limitation.
- ⊖ Task upgrading requires domestic workers to have or to develop the higher skills needed, which may cause job and wage polarization among domestic workers.

AUTHOR'S MAIN MESSAGE

Firms choose to relocate production abroad to gain access to foreign markets and reduce production costs. Relocation may be associated with domestic job destruction, but the net effect is generally limited and comes with task upgrading. As task upgrading requires domestic workers with the right skills, a negligible overall net effect may conceal non-negligible job and wage polarization among workers of different skills. Thus, the policy challenge is to help domestic workers seize the opportunity for task upgrading by building the type of communication and cognitive skills that domestic firms have a hard time finding abroad.



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MOTIVATION

Offshoring relocates production abroad, leading to trade in intermediate goods across borders. Its impact on domestic jobs is more complicated than directly replacing domestic workers with foreign ones. The most common view on offshoring is that it harms domestic workers by allowing firms to tap cheap foreign labor. However, while offshoring production may directly displace domestic workers, it may also indirectly raise the demand for domestic workers by paving the way to an increase in overall production. In the end, whether direct job destruction or indirect job creation dominates is an empirical question.

At the same time, the overall net employment effect of offshoring may also conceal asymmetric effects across workers that vary according to their skills, sectors, and occupations. Whether “winners” and “losers” are concentrated in different skill groups, industries, or occupations is also an empirical question. It is, however, harder to answer as it requires a degree of detail in the data that is more difficult to obtain.

DISCUSSION OF PROS AND CONS

There are two main reasons why firms choose to relocate production abroad: better market access (horizontal motive) and lower production costs (vertical motive). Where trade barriers of various sorts exist (administrative, legal, informational), local production may be an effective way—sometimes the only way—to reach foreign customers. But even without such barriers, relocating production abroad may be an effective way to cut costs by sourcing from cheap foreign suppliers. And it is certainly the only way to take direct advantage of cheap foreign labor.

Offshoring and its discontents

While the horizontal motive has more traction when trade barriers are high, the vertical motive gains appeal as trade barriers fall. Jumping high trade barriers to better access foreign markets is precisely why horizontal relocation takes place. High trade barriers stand in the way of the international fragmentation of production, which would situate stages of the supply chain wherever they happen to be most cost-effective, the vertical motive for relocating production abroad. While both motives involve some reallocation of jobs between domestic and foreign production sites, in the public debate the term “offshoring” typically refers to the relocation abroad of intermediate stages of the value chain but whose ultimate aim remains serving domestic customers. This interpretation may be due to the fact that, by lowering trade barriers, globalization promotes more vertical than horizontal relocation. It may also be due to the fact that horizontal relocation is more readily understood as a necessary evil, worth suffering in order to penetrate foreign markets (especially when domestic markets are anemic). Contrarily, as long as the final customers remain domestic, vertical relocation is more likely to be seen as opportunistic behavior, to the detriment of domestic workers and suppliers.

Direct and indirect employment effects

One reason for the negative public image is that the migration of some jobs abroad is the most visible development accompanying offshoring and, as such, is generally perceived as its overall net effect. For example, if a UK bank is reported to have offshored 500 back-

office positions to India, in the public debate there is a presumption that 500 jobs have been destroyed in the UK as a net effect of this offshoring choice [2], [3]. In fact, the calculation is more complicated than that due to many parallel direct and indirect effects. The 500 jobs relocated to India constitute a direct “displacement effect” of UK workers with Indian ones. However, offshoring these jobs may increase the UK bank’s efficiency; for example, by allowing its UK employees to specialize in tasks in which they have a comparative advantage—tasks in which they are relatively more productive than their Indian counterparts. This pattern of international task specialization according to workers’ comparative advantage may eventually allow the bank to grow and thus to create new jobs in the UK market. This is the indirect productivity effect of offshoring.

So far, both the displacement and the productivity effects are internal to the bank, but additional effects may operate outside its boundaries. Moving some back-office operations to India directly destroys jobs in upstream suppliers serving those operations. On the other hand, if offshoring boosts the bank’s efficiency, its UK business customers will enjoy better service at a lower price. This will reduce the business’ costs, making the bank more efficient and possibly fostering its expansion and the creation of additional domestic jobs. Analogously for final consumers, saving on the price of banking services will enable them to divert expenditures to other goods and services. As long as some of these are supplied domestically, overall domestic employment by their suppliers will increase.

What the empirical evidence shows

Whether the negative displacement effects of offshoring dominate the positive productivity effects inside and outside the boundaries of the offshoring firm is ultimately an empirical question. While a complete answer would take all these effects into account, the data requirements for completeness are simply too difficult to meet, especially for measuring the effects outside the boundaries of specific sectors and in a cross-country perspective.

Firm- and sector-level studies

As a result, most empirical assessments are restricted to analyzing only the effects within the firm or sector in which offshoring takes place. In yet another complication, offshoring is rarely the only possible cause of domestic workers losing their jobs. Turnover in the labor market may be driven by other concurrent developments, such as technology change, customer needs, competition, and business context. The impacts of these developments must be accounted for before attributing any domestic job losses to offshoring [3].

Firm-level studies are crucial to understanding the mechanisms through which offshoring can cause domestic workers to lose their jobs [3], [4], [5]. However, sector-level studies are more relevant if the aim is to quantify the aggregate employment effects of offshoring. When the focus is on more reliably measured effects within sectors, the impact of offshoring on employment in member countries of the OECD is found to be quite limited. A hallmark study suggests that an increase of 1% in offshoring results in a decrease of 0.15% in sectoral employment in manufacturing and of 0.08% in services [2]. Disentangling displacement and productivity effects reveals that offshoring within the same sector does not have much impact on domestic employment. That is because job creation associated with the productivity effect is strong enough to offset job destruction associated with the displacement effect, although domestic production stages become less labor intensive [6].

Overall, when sectoral studies are complemented by more disaggregated analyses at the firm level, the evidence supports a rather limited impact of offshoring on domestic employment within sectors [3]. Some variation is observed across workers at different skill levels, with low-skill workers more likely to suffer and high-skill workers more likely to prosper [4]. Differences are also observed between horizontal and vertical offshoring, with horizontal offshoring hurting domestic employment and vertical offshoring fostering it [5].

Distinguishing between the effects of skills and occupations

This variation observed across workers at different skill levels has motivated more detailed analyses to distinguish between the effects of skills and occupations. The idea is that the sectoral perspective complicates the impact of offshoring by focusing on sectors in which the offshoring takes place while neglecting parallel effects on other sectors, linked by the inter-sectoral mobility of workers employed in similar occupations. This leads to stressing occupational exposure to offshoring activities, defined as the weighted average exposure to offshoring of an occupation across sectors, with each sector's exposure weighted by its share of workers in that occupation [7]. Measuring occupational exposure by linking sector-level data on offshoring with data on individual workers reveals a substantial divergence between the effects of sectoral exposure on wage outcomes and those of occupational exposure. When exposure is measured at the sectoral level, offshoring has no negative effects on the wages of all types of workers. When measured by occupation, the negative effects are sizable.

Occupational exposure puts downward pressure on wages through the reallocation of workers from higher-wage manufacturing jobs to lower-wage jobs in other sectors and occupations [7]. This pressure is reinforced when the cross-sectoral effects of offshoring are factored into the analysis, depending on the type of occupation. Non-routine and interactive job tasks can act as a shield against the negative wage impact of offshoring [8]. Employment adjusts accordingly, as shifts toward more non-routine and more interactive tasks favor highly educated workers. In particular, offshoring within multinational manufacturers and service providers is associated with skill upgrading for domestic jobs.

Interactions between the routineness of tasks and the skills of workers

The shift from routine and non-interactive job tasks toward non-routine and interactive tasks suggests that “offshorability” is inversely related to non-routineness and interactivity [9]. It is therefore important to understand the interactions between the routineness of tasks and the skills of workers. Routineness may be conducive to automation, which in principle could be used to replace domestic workers with substitutable skills without turning to offshoring [10].

Many middle-skilled cognitive and manual jobs are characterized by routine. Examples include book-keeping, clerical work, repetitive production, and monitoring jobs. The defining feature of these tasks is that they are performed according to “codifiable” practices that follow precise and well-understood procedures. As such, these tasks can be readily translated into mechanical instructions that can be implemented by machines or by foreign workers remotely. For example, computerization has been singled out as a likely cause behind the hollowing out of several clerical and administrative occupations in high-income countries such as the US. It is the possibility of codifying routine tasks in computer software that allows the tasks to be performed by machines or by workers abroad. This does not necessarily mean that computerization has reduced the importance of routine tasks. What it means is that tasks in which workers devote much of their time to collecting, organizing, analyzing,

and transmitting information are increasingly reallocated to machines or offshore workers as long as the costs of offshoring information-intensive tasks are progressively reduced by technological advances.

The rise in the automation and offshoring of routine tasks has a positive impact on the relative demand for workers who have the right skills to perform complementary non-routine tasks. A classification that has proven useful for empirical analysis partitions non-routine tasks into two main categories that are traditionally at opposite ends of the skill spectrum: abstract and manual [10].

On the one hand, there are non-routine abstract tasks, which include activities intensive in problem-solving, intuition, persuasion, and creativity. Abstract tasks require high levels of education and analytical skills and characterize professional, managerial, technical, and creative occupations such as those in design, engineering, management, medicine, and science. These tasks are complementary to automation and computerization because of their intensity in analytical reasoning, problem-solving, and creative thinking. As the tasks often rely heavily on information content, technological advances that lower the costs of gathering, systematizing, and analyzing information will raise demand for workers who can perform such abstract tasks. As this type of worker is relatively scarce in low-income countries, non-routine abstract tasks are less likely to be offshored.

On the other hand, there are non-routine manual tasks, which include activities involving in-person interactions, situational adaptability, and visual and language recognition. Though not requiring much formal education above high-school level, these tasks are nonetheless impossible to offshore as they usually have to be performed in person in the place where the corresponding service is to be provided. They include mundane activities, such as driving a bus, cooking a meal, installing a wooden floor, and cleaning an office, that require physically fit workers, often (but not necessarily) with good language skills. Formal education above the high-school level is not usually required, especially for service jobs such as food preparation and serving, cleaning and janitorial work, grounds cleaning and maintenance, in-person health assistance by home health aides, and some jobs in security and protective services [10]. These jobs are hard to automate because they need interpersonal and environmental adaptability as well as the freedom to respond to interactions that are hard to predict and capture in a codified set of procedures.

Understanding the interactions between the routineness of tasks and the skills of workers is thus very important. Automation and offshoring can be used to replace domestic workers with skills involving routine and non-interactive tasks, thus cutting into their employment. At the same time, automation and offshoring may instead foster the employment of workers with skills involving non-routine and interactive tasks thanks to their complementarity. These differences may explain part of the polarization of employment observed in high-income countries at opposite extremes of the occupational skill spectrum [10].

The devil in the details

Analyses at the level of individual firms or workers suggest that even a limited aggregate net effect of offshoring on domestic jobs may mask considerable change at a more disaggregated level in the distribution of gains and losses among workers with different skills. As not all jobs have the same skill content, additional insight can be gained by looking at how offshoring affects the matching of the skill requirements of tasks to the skills of workers [11].

Conceptually, when tasks have different relative skill intensities and workers have different relative skill abundance, the comparative advantage of high-skill workers in high-complexity tasks (tasks intensive in communication and cognitive skills rather than manual skills), and the larger relative supply of those workers in OECD countries, imply that jobs involving more complex tasks stay whereas jobs involving less complex tasks migrate. Accordingly, easier offshoring pushes domestic workers toward more complex tasks (task upgrading), increasing domestic wage and employment inequality among domestic workers with different skill levels due to the increase in the overall supply of cheaper low-skill labor.

The problem in confirming these predictions is that it requires detailed information on the complexity of tasks performed by domestic and offshore workers together with detailed information on their skills. Some countries (such as Germany and the US) do provide such information on domestic workers, but similar information on offshore workers is virtually unavailable. It is, therefore, very hard to know the precise attributes of offshored tasks and offshore workers. A way around this obstacle is to adopt a “dark-matter approach” that infers the unobservable relative skill intensity of offshored tasks and the unobservable relative skill abundance of offshore workers from the evolution of the observable task specialization of native and immigrant workers. The underlying idea is that unobserved offshore tasks and workers must exhibit specific features in order to make sense of the response of native and immigrant task specialization to easier offshoring [1].

Differentiation of tasks and skills of immigrant, native, and offshore workers

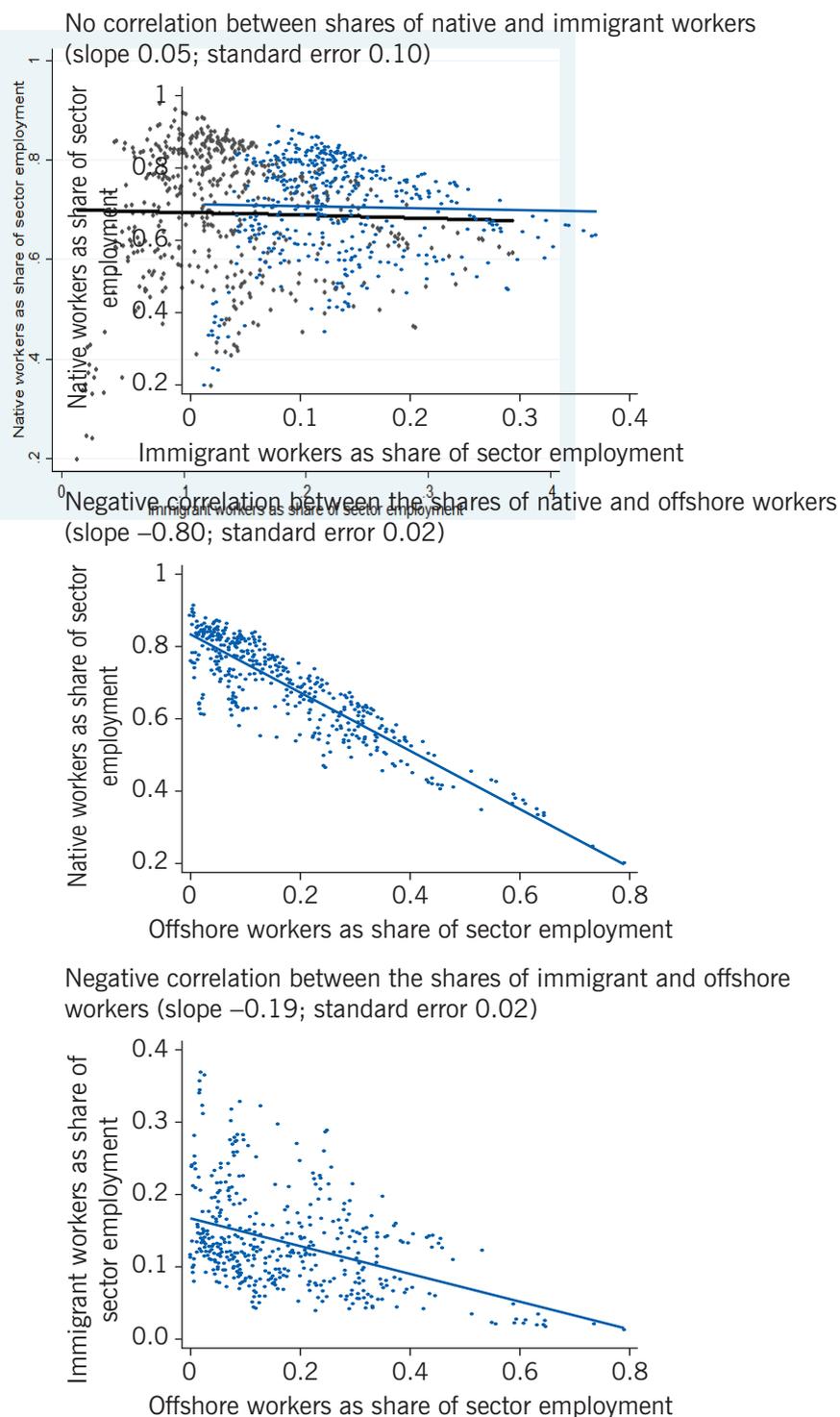
Figure 1 summarizes the distribution of immigrant, native, and offshore workers across 58 manufacturing sectors in the US for 2000–2007. It shows no cross-sectoral correlation between the shares of native and immigrant workers but a negative correlation between the shares of offshore workers and of immigrant and native workers. For concreteness, Figure 2 gives some examples of the relative employment shares of the different types of workers across sectors.

On their face, these facts appear consistent with a scenario with the following three characteristics: stronger substitutability between immigrants and offshore workers than between immigrants and natives; immigrant, native, and offshore workers are relatively specialized in tasks of different skill complexity; and immigrants are relatively specialized in low-complexity tasks, natives in high-complexity tasks, and offshore workers in medium-complexity tasks [1].

Deeper investigation confirms this initial impression [1]. In terms of direct job destruction, more offshoring decreases the share of natives and immigrants in overall sector employment, while more immigration decreases the share of offshore workers but has no impact on the share of natives. In terms of indirect job creation, more offshoring has no impact on the employment levels of natives, while more immigration has a small positive impact. This reveals the presence of efficiency gains, which lead to the expansion of production and employment.

Crucially, analyzing the impacts of offshoring and immigration on the complexity of the average task performed by natives and immigrants reveals that more offshoring shifts the average native task toward higher communication and cognitive content and pushes the average immigrant task toward higher manual content. In contrast, the impact of more immigration on the average native task is negligible.

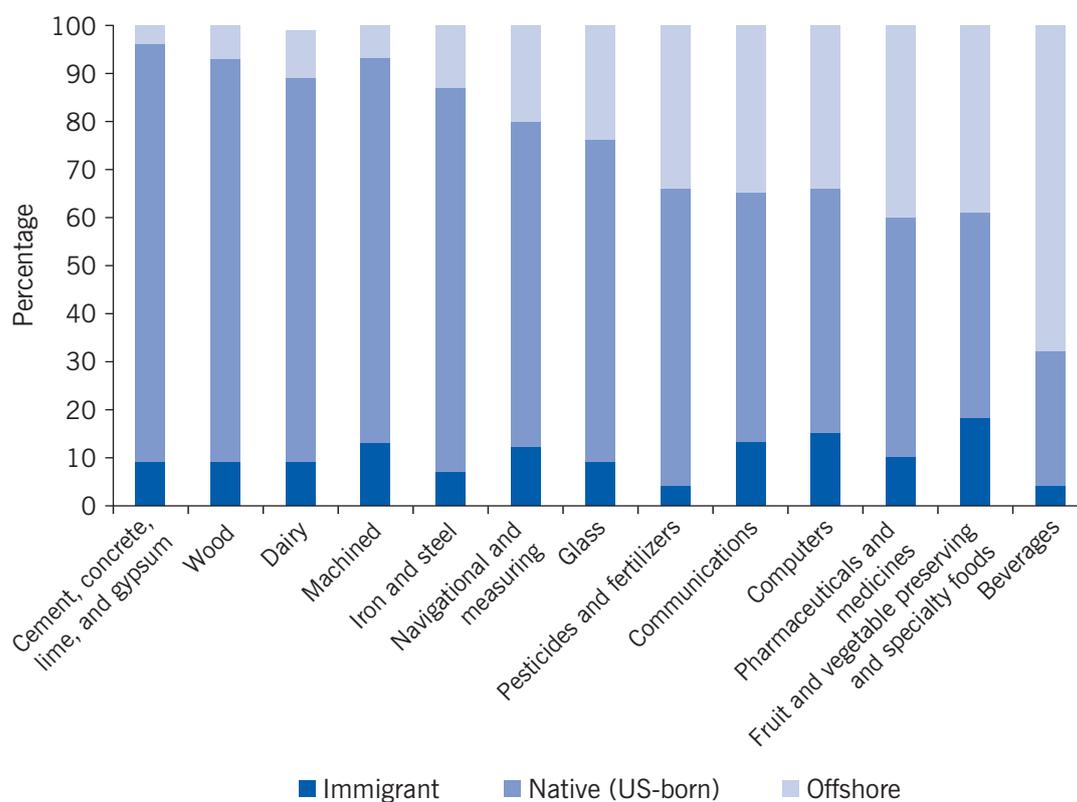
Figure 1. Cross-sectoral correlations of shares of immigrant, native, and offshore workers for US manufacturing sectors, 2000–2007



Note: Data are for 58 manufacturing sectors in the US. The slope of the regression line shows the unit change in the share of the variable shown on the vertical axis for a unit change in the share of the variable shown on the horizontal axis.

Source: Ottaviano, G., G. Peri, and G. Wright. "Immigration, offshoring and American jobs." *American Economic Review* 103:5 (2013): 1925–1959 [1].

Figure 2. The shares of immigrant, native, and offshore workers vary by US manufacturing sector, 2007



Source: Ottaviano, G., G. Peri, and G. Wright. "The impact of immigration and offshoring on American jobs is far more complicated than directly replacing workers." London School of Economics and Political Science, American Politics and Policy blog, December 3, 2013. Online at: <http://blogs.lse.ac.uk/usappblog/2013/12/03/the-impact-of-immigration-and-offshoring-on-american-jobs-is-far-more-complicated-than-directly-replacing-workers/>

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Accordingly, immigrants seem to compete more for tasks performed by offshore workers than for tasks performed by natives. More to the point, for these findings to make sense, it has to be the case that while immigrants specialize in low-complexity tasks and natives specialize in high-complexity tasks, offshore workers specialize in intermediate-complexity tasks. More offshoring then takes away jobs of intermediate complexity from both immigrants and natives, pushing immigrants toward less-complex tasks and natives toward more-complex tasks. Nevertheless, by allowing production to expand, the efficiency gains from offshoring indirectly offset the direct destruction of native jobs.

LIMITATIONS AND GAPS

The quality of the public debate on job migration would benefit from richer harmonized data and more homogeneous methodologies. A full assessment of the domestic employment effects of offshoring requires information that is not fully available in existing data sets.

Employment effects should be measured applying the same methodologies to harmonized cross-country data sets. Their measurement should account not only for intra-sectoral effects but also for inter-sectoral effects since offshoring in a sector may affect the performance of

all related sectors. Doing this requires consistent information on inter-sectoral input–output linkages. As different effects may appear over different time intervals, the ideal data set should also allow for long periods of observation.

Even when correctly measured, aggregate effects may still hide rich disaggregate developments that are particularly important in assessing the distribution of gains and losses from offshoring across categories of workers and occupations. The ideal data set should thus provide detailed information on workers' relative skill abundance and on the relative skill intensity of various tasks.

Because the current evidence does not draw on such an ideal data set, it is “difficult if not impossible to evaluate single individual studies within the larger literature, as these studies differ tremendously in terms of countries, databases, empirical estimations” [3].

SUMMARY AND POLICY ADVICE

That offshoring is a hotly debated issue in high-income countries is easily explained. By definition, offshoring is associated with job creation abroad. If the overall number of jobs is taken as fixed, then job creation abroad comes with job destruction at home. However, the overall number of jobs is not necessarily fixed. Offshoring allows domestic firms to gain access to foreign markets and to reduce production costs. As long as better foreign market access and lower production costs make domestic firms more competitive, offshoring expands production and creates new jobs for domestic workers as well. New jobs do not necessarily involve the same tasks that are offshored, but the new jobs certainly involve tasks that are complementary to the offshored tasks.

Policymakers should be aware that the available evidence for high-income countries shows a limited net employment effect of offshoring on domestic jobs, with most of the impact realized through task upgrading of domestic workers. Task upgrading occurs because the offshored tasks are less complex than the tasks that remain at home. Because offshoring can lead to productivity gains and task upgrading at home, what policymakers should prioritize is not curtailing offshoring but rather helping domestic workers seize the opportunities presented by task upgrading. Policymakers can do this by supporting domestic workers in building the types of communication and cognitive skills that domestic firms have a hard time finding abroad through forward-looking vocational education for future workers and focused retraining programs for current workers.

Acknowledgments

The author thanks two anonymous referees and the IZA World of Labor editors for many helpful suggestions on earlier drafts.

Competing interests

The IZA World of Labor project is committed to the *IZA Guiding Principles of Research Integrity*. The author declares to have observed these principles.

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Further reading

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