

Threat or Help? The Effects of Unskilled Immigrant Workers on National Productivity Growth

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While unskilled immigrant workers have relatively low formal human capital, theory suggests that they can still contribute to productivity improvements by helping to increase efficiency and upgrading the skills of the native labor force. Empirical studies indicate that positive productivity effects do occur. This body of evidence does not provide a compelling argument for the closing of national borders to unskilled foreigners on economic grounds.

A world in motion

The number of migrants—foreign-born residents in countries across the globe—reached 244 million in 2015 (United Nations 2015), about 3 percent of the world’s population. Over the past 50 or so years, the growth in migrants has been largely driven by people migrating from relatively less developed countries to relatively more developed nations (Ozden et al. 2011; Abel and Sander 2014). Figure 1 illustrates the pattern of migration to countries with higher education levels among key sending and receiving countries from 2005 to 2010.

Theoretical and empirical studies on the impact of immigrant labor on host countries have focused extensively on employment and wages (for instance, Nijkamp, Poot and Sahin (2012) and Peri (2014) note, on average, very small economic effects), but less so on wider implications, including for growth of total factor productivity (TFP). TFP growth, which measures how effectively inputs come together to produce output, reflects technological progress (creating new or better things) and improvements in efficiency (doing existing things better). TFP is key to sustaining per capita income growth over time. A country’s per capita income can be decomposed into labor productivity (how much a worker can produce in an hour worked), which is influenced by TFP; the employment rate; and the share of working-age people in the general population.

This policy brief discusses the channels through which unskilled immigrant labor (typically defined as workers with, at most, secondary education) affects labor productivity and its components in countries that receive migrants. It also summarizes available empirical evidence. Empirical work specifically relating to unskilled immigrant workers is scarce. Nevertheless, evidence on the impact of the total population

of immigrant workers on productivity suggests that the effects are slightly positive. Individual country outcomes, however, vary. Consequently, countries need to fully understand their own immigrant experience within the broader context of developments in the economy and policies aimed at productivity growth.

Channels through which unskilled immigrant labor affects productivity in labor-receiving countries

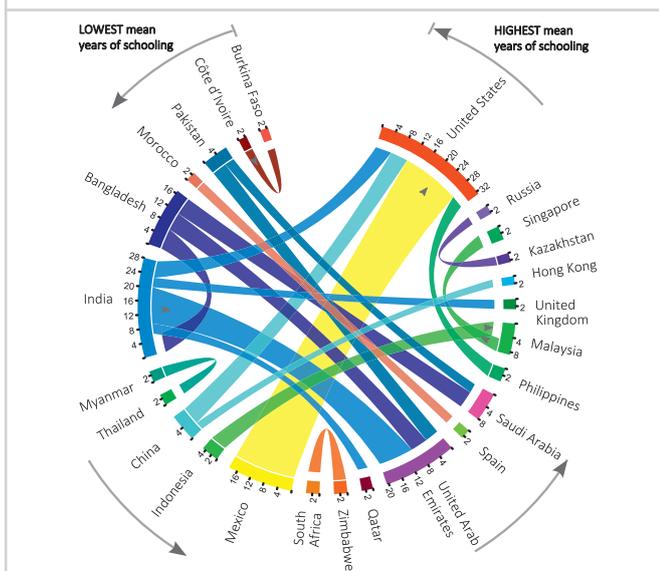
In general, higher labor productivity is driven by capital deepening (higher physical capital per worker); the skills intensity of workers (higher human capital per worker); and changes in TFP. These three factors and their interrelationships are shown in the center panel of figure 2. Physical capital (such as buildings, machinery, and equipment) and workers with knowledge and experience contribute to productivity increases, especially when both move together. Skilled workers without sufficient physical capital, or the accumulation of physical capital without capable operators, result in diminishing returns to the respective inputs. TFP growth is spurred by inventions or the adoption of new technology, as well as shifts in production management and organizational capabilities. TFP changes can be facilitated by skilled workers and physical capital via spillover effects (shown as dashed arrows in panel b). For instance, skilled workers involved in research and development may create new knowledge that is used across firms (this line of thinking is based on endogenous growth theory (Romer 1986, 1990)).

Panel a illustrates the immediate (mechanical) effects of an influx of unskilled immigrant workers. The labor productivity level declines if the influx of immigrants increases the proportion of unskilled workers. Meanwhile, capital is diluted because the supply of physical capital is fixed in the short term. However, this is only one part of the story. As firms and workers adjust, other resultant dynamic channels of effects come into play. In particular, unskilled immigrant workers can help upgrade the skills of the native labor force and increase the efficiency of production (see panel c). These dynamic channels for productivity effects are discussed next.

An influx of immigrant labor, if it has heterogeneity in skills with respect to natives, changes the relative distribution of skills in the labor force. High-skilled immigrant workers can directly facilitate technological progress through invention and innovation. For example, research suggests that high-skilled immigrants are positively associated with patenting and business start-ups (see, for instance, Nathan (2014)). In addition, foreign direct investment, regarded as a source of capital and technology transfer, appears to be positively related to immigrant stocks, with “networks” of investors more likely attributable to skilled immigrants than unskilled labor (for further discussion, see Grossman (2016) and Nathan (2014)).

Although unskilled immigrant workers are not inventors and innovators, they can still enhance efficiency and indirectly contribute to technological progress through *complementarity* with natives which enables task reallocation and *specialization*, and promotes skills diversity (Peri and Sparber 2009; Peri 2010, 2012). The increase in the supply of workers for manual jobs (and the ensuing opportunities for expansion) boosts demand for more complex tasks. These are filled by natives, some of whom move out from the manual jobs. Natives have a comparative advantage in occupations that are complex and communication-intensive. This shift from physical-skill to language-skill intensity has been observed in the occupations of native workers in various U.S. states that have received large inflows of less-educated

Figure 1. The 20 Largest Country-to-Country Migration Flows, 2005–10



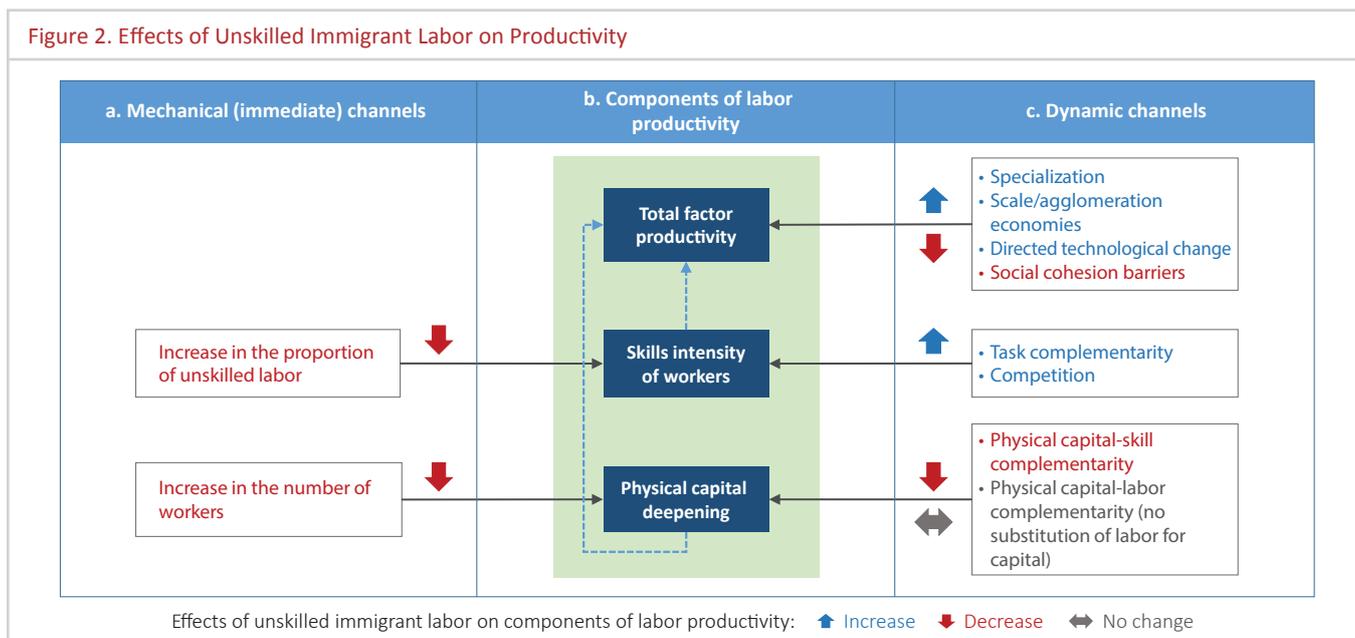
Source: Global Migration Data Sheet 2005–10, Wittgenstein Centre.
Note: Tick marks indicate size of the migration flow in 100,000 increments. Flows have the same color as the origin country.

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Figure 2. Effects of Unskilled Immigrant Labor on Productivity



immigrants (Peri and Sparber 2009). There is also evidence of a positive link between changes in the task specialization of less-educated natives and TFP growth in the United States (Peri 2012). In Malaysia, unskilled immigrant workers fill gaps in low-to-middle-skilled occupations (such as cleaners, laborers, and plant and machinery operators/assemblers) in labor-intensive sectors (construction, agriculture, and some types of manufacturing). This benefits natives with middle-level skills (those with at least secondary-level education), with whom they have some overlap of tasks (Munoz Moreno et al. 2015). It also benefits tertiary-educated women, to some extent, who are able to join the labor force when low-cost domestic household services become available (World Bank 2013).

Even if unskilled immigrant workers are homogenous in skills relative to natives, the effects on TFP can still be positive. For one thing, the availability of immigrant labor may promote *scale and agglomeration economies*. An increase in labor supply can lower the cost structure by allowing for higher output levels to be spread over given fixed costs amid lower variable costs. This effect is particularly potent when there are labor shortages and when there are opportunities to expand to new markets. A study of the case of the impact of immigration on employment of Malaysia’s native workers finds that scale effects outweigh substitution effects (Ozden and Wagner 2014). In the United States, the effects on employment, investment, and income are more positive in economic expansions than recessions, Peri (2010) finds. Moreover, the pooling of skill- and task-specific labor supports learning and the generation of ideas, which can lead to simple process improvements. For another thing, *increased competition* among similar workers may incentivize natives to perform tasks more efficiently and upgrade their skills.

The extent of these benefits may be somewhat impaired by poor interaction between native and immigrant workers (*social cohesion*) because of trust and communication barriers. Nevertheless, these barriers may dissolve over time as immigrants adapt to their host countries. The variety within the immigrant stock (the diversity of immigrant birthplaces) may have some costs in terms of cohesion, notwithstanding an overall beneficial effect on per capita income from skill complementarities, Alesina, Harnoss, and Rapoport (2016) suggest. In a large cross-section of countries, they find positive effects from diversity to be largest for immigrants originating from richer countries (potentially a proxy for higher skills) and from countries at intermediate levels of cultural proximity.

Another possible channel of effect on firm behavior from unskilled immigrant workers is when firms adopt technologies and physical capital that are more suited to the efficient and intensive use of unskilled workers, and which nevertheless may contribute to increases in TFP in traditional sectors (Peri 2010, 2012). This process, based on the relative supply of skills, is known as *directed technological change* (for further discussion of this concept, see Acemoglu (1998, 2002)).

Do all these channels support continued labor productivity growth over the long term (amidst continued inflows of unskilled immigrants) or do they provide mainly one-off level effects? For instance, as new

unskilled foreign workers enter the labor force, what are the opportunities for continuous upgrading of the skills of natives and existing immigrants? What are the effects of a deterioration in the skills-intensity of the labor force on TFP growth through changes in physical capital? If the skills-intensity of the labor force deteriorates, and if physical capital is more complementary to skilled labor than unskilled labor (*physical capital-skill complementarity*), physical capital deepening would be reduced in favor of unskilled labor, which could lower TFP growth. On the other hand, if there is no substitution between physical capital and labor (they are complements regardless of skill—*physical capital-labor complementarity*), flexible capital over the medium to long term will allow firms to bring the capital-labor ratio to the same level as before the influx of unskilled migrant workers, with no net change in TFP growth (figure 2, panel c).

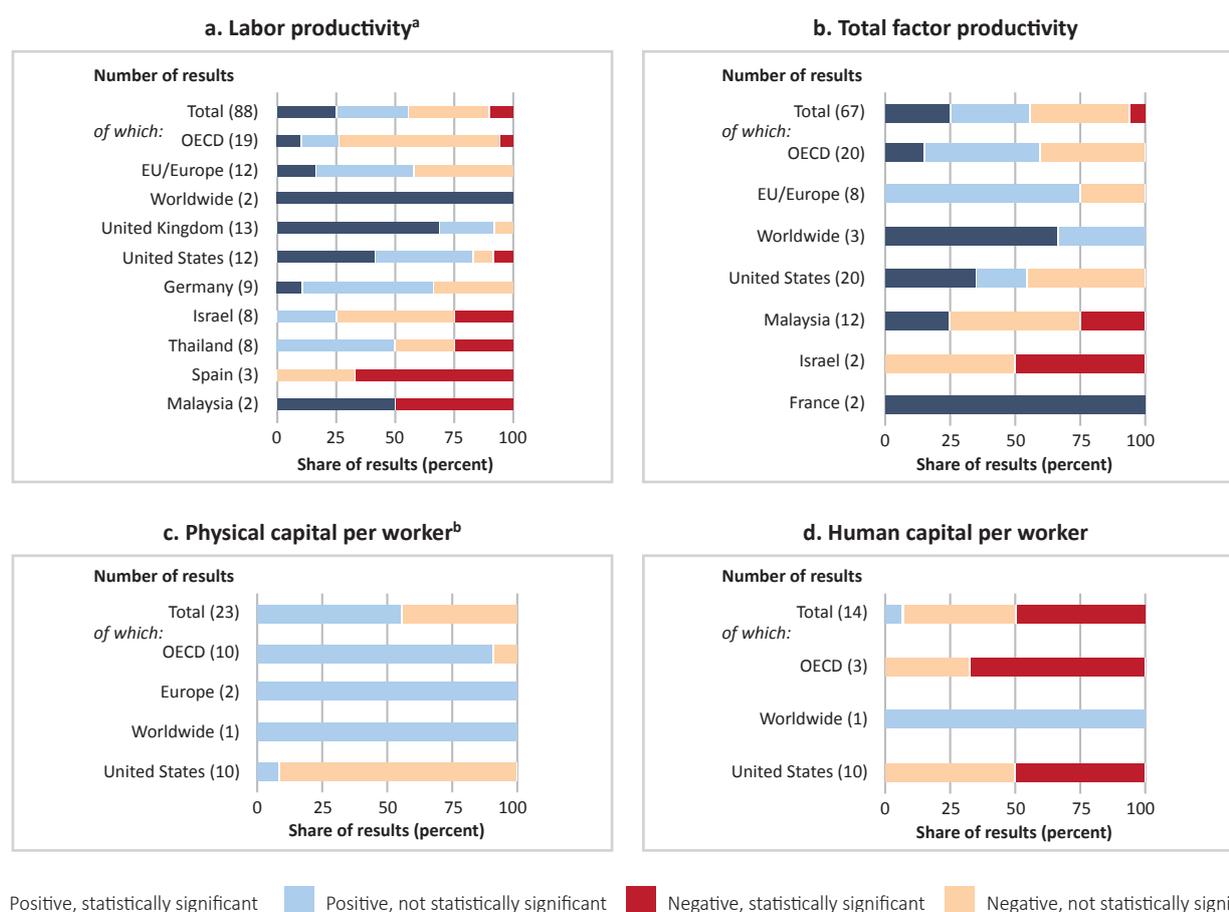
What does the empirical evidence suggest about the net impact on productivity of an influx of unskilled immigrant workers?

The discussion that follows analyses the econometric results for immigrant effects on labor productivity and its components. The results are drawn from 22 primary studies (12 peer-reviewed journal articles, 6 reports/conference proceedings, and 4 reputable recent working papers) covering the world, Europe/the European Union (EU), member-countries of the Organisation for Economic Co-operation and Development (OECD), and several individual countries (France, Germany, Israel, Malaysia, Spain, Thailand, the United Kingdom, and the United States). The studies are listed in the reference list in the Empirical Results section.

Unfortunately, explicit analysis on skilled versus unskilled foreign workers is scarce. Thus most of the results pertain to the effects of total immigrants. Nevertheless, the results remain instructive, given the overwhelming direction of flows from less educated to more educated countries (as seen in figure 1). Moreover, for many countries, the proportion of tertiary-educated immigrants is relatively small: for example, slightly less than 30 percent of immigrants to the OECD member-countries as of 2010/11 (UN-DESA and OECD 2013). The risk of relying on total immigrants as a gauge for unskilled workers is, of course, the misattribution of the effects of skilled workers to unskilled workers. The results for total immigrant effects are summarized in figure 3.

The results suggest that on balance, total immigrant effects on labor productivity are statistically insignificant to positive (figure 3, panel a). Broken down to the three components of labor productivity, statistically significant positive effects are especially apparent through TFP (panel b). There is no statistically significant impact of total immigrants on capital per worker (panel c), suggesting that capital accumulation need not be adversely affected. This might be because immigrant flows are fairly predictable, for the most part, and generally account for only a small percentage of the labor force, Ortega and Peri (2009) suggest, in a study of OECD countries over the 1980–2005 period. The intensity of formal skills (panel d) is somewhat negatively

Figure 3. Effects of Total Immigrants on Labor Productivity and Its Components



Source: Author's calculations based on results from 22 primary studies.

Note: Most of the studies surveyed contain several main regression results involving different specifications (in terms of controls and sample coverage). Where a study contains both ordinary least squares (OLS) and instrumental variable (IV) regressions, only the IV regression results are tabulated. Results are also only drawn from regressions with the most fixed effects, when there is no variation in specification. Shares reflect total immigrant effects according to regression coefficient signs and degrees of statistical significance across various units of aggregation (country, state/region, sector or firm). Statistical significance is at minimum 5% level. EU = European Union; OECD = Organisation for Economic Co-operation and Development.

a. Labor productivity comprises a mix of output per worker (which includes the effect of hours worked) and output per hour.

b. Physical capital per worker comprises a mix of capital per worker and the capital-to-output ratio.

affected by total immigrants, which suggests that immigrants' compositional effect on skills tends to outweigh the effect on the upgrading of natives' skills. Nevertheless, it is worth highlighting that in the studies that analyze labor productivity alongside all three components, positive immigrant effects on TFP are found to more than offset the effects on physical capital per worker and human capital per worker (see Aleksynska and Tritah (2015) on OECD countries; Peri (2010, 2012) on the United States; and Ortega and Peri (2014) on a large cross-section of countries).

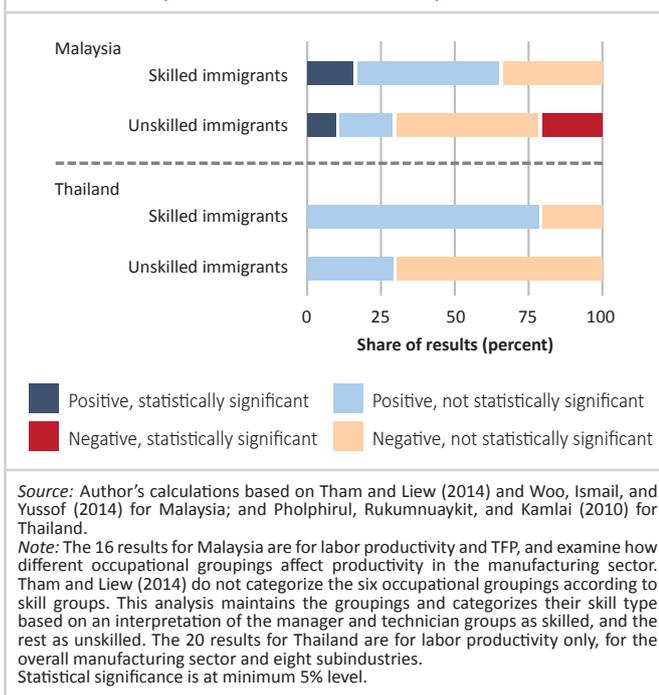
Outcomes are nevertheless quite varied across individual countries. For example, the proportion of positive total immigrant effects are particularly obvious for the United Kingdom and the United States, but less so for Malaysia and Thailand (figure 3, panels a and b). This does not mean that the TFP benefits accruing to the United Kingdom and the United States are solely due to skilled foreigners or that Malaysia and Thailand are severely disadvantaged by unskilled immigrants. For the United States, evidence from instrumental variable (IV) estimations that span the period from 1960 to the 2000s and utilize changes of up to 10 years in state-level data indicate positive productivity growth over the long term. As discussed, these effects are strongly associated with the efficient allocation of skills to tasks induced by unskilled immigrant inflows (Peri 2012). In the case of the United Kingdom, a study over a 10-year period (1997–2007) finds positive results for labor productivity, which are robust to controlling for the education level of immigrants across regions (Rolfe et al. 2013). Notwithstanding the questionable direction of causality—given the use of ordinary least squares (OLS) regressions—the results may still suggest indirect productivity effects, which are consistent with qualitative findings of employers recruiting on the basis of shortages and complementarities with natives.

Although nearly all immigrant workers in Malaysia and Thailand are almost completely unskilled, the results for these two countries do not indicate unequivocal negative productivity effects. Studies of Malaysia tend to focus mainly on the manufacturing sector. The only study on Malaysia (in this survey) that takes a cross-sectoral approach (World Bank 2013) notes different TFP effects on different sectors in the 2005–10 period: positive for large manufacturing and construction firms, but negative for small-to-medium plantation firms. This suggests the possibility of varying implications of immigrants in terms of complementarity with natives, adoption of appropriate technologies and scale economies across different sectors and firm sizes.

Results for Thailand (from Pholphirul, Rukumnuaykit, and Kamlai 2010) are statistically insignificant (for the aggregate economy and agriculture sector) to negative (for the manufacturing and services sectors) for the 1990–98 period, but may suffer from reverse causation. While the authors find immigrants and natives to be substitutes, they also suggest that immigrants may help push natives toward high-technology sectors over the longer term, noting that their results can be viewed as reflecting short-term responses. Further, for both Malaysia and Thailand, while there is some indication that skilled immigrants have more positive effects than unskilled immigrants in the manufacturing sector, the statistical significance of these results is not particularly strong (figure 4) (these are the only results from this survey that explicitly account for unskilled immigrant effects).

The cross-country empirical evidence suggests that underlying the likelihood of positive net productivity effects from foreign workers is the link of immigrants—regardless of skill level—to specific needs in host countries (for example, granting of visas through employment-based entry), and host countries' response to shocks. The results for

Figure 4. Effects of Skilled Versus Unskilled Immigrants on Productivity: Selected Results for Malaysia and Thailand



Israel provide an interesting counter-example to the Malaysia and Thailand cases as recipients of mainly unskilled foreign workers. Focusing only on the Israeli manufacturing sector in the 1990s, Paserman (2013) highlights the unique situation of a large influx of skilled immigrants (fleeing the collapse of the Soviet Union) that did not have positive effects on productivity. Possible reasons include skills mismatch and occupational downgrading, as well as difficulties in assimilating.

Productivity effects are also likely to differ between the short term and long term. Some studies explicitly point to stronger positive effects from total immigrants over the long run, which reinforces the importance of understanding dynamic adjustments, as discussed. For instance, long-term gains to U.S. productivity become more significant after 7 to 10 years, Peri (2010) finds. Older immigrants (age 25–54), who likely have resided longer and have more experience in their host countries, have a positive effect on productivity, while younger immigrants (age 15–24) have a negative effect, a study of OECD countries suggests (Aleksynska and Tritah 2014).

Conclusion

The limited existing empirical evidence does not provide a clear indication that unskilled immigrants are detrimental to productivity. In fact, efficiency gains are quite possible, as observed for the United States, through task specialization, competition, and the adoption of appropriate techniques. Further empirical research is needed to better understand the channels through which unskilled immigrants affect productivity, and how these vary for different countries across different time spans.

Indeed, a key methodological improvement required for individual country analysis is clarity in defining and measuring short-term and long-term effects. Richer data are critical. A number of sources exist, but remain inadequate (Carletto, Larrison, and Ozden 2014). More firm-level analysis would be beneficial to better understand employer behavior and the mechanisms of immigrant effects within organizations (Nathan 2014).

As it stands, it is hard to make an economic case for a ban on unskilled immigrant workers as a way to enhance productivity. This is especially so when coupled with the welfare-enhancing effects for immigrants, as reflected by the “place premium” (workers earn more simply by working in the United States rather than in their own countries (Clemens, Montenegro, and Pritchett 2009)). Beyond the special case of humanitarian crises, countries should focus on improving their immigration systems to reap mutually reinforcing benefits for natives and immigrant labor. Related steps include quantifying economic needs; enhancing data management for monitoring and verification; and widening collaboration with sending countries (see for instance, Munoz Moreno et al. (2015)).

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