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# The Rise of the Robot Reserve Army: Automation and the Future of Economic Development, Work and Wages in Developing Countries

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## SUMMARY

Employment generation is crucial to spreading the benefits of economic growth broadly and to reducing global poverty. And yet, emerging economies face a contemporary challenge to traditional pathways to employment generation: automation, digitalization, and labor-saving technologies. 1.8 billion jobs or two-thirds of the current labor force of developing countries are estimated to be susceptible to automation from today's technological standpoint. Cumulative advances in industrial automation and labor-saving technologies could further exacerbate this trend. Or will they? This brief asks what is likely to be the impact of automation on developing countries.

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## About the GPID research network:

The ESRC Global Poverty and Inequality Dynamics (GPID) research network is an international network of academics, civil society organisations, and policymakers. It was launched in 2017 and is funded by the ESRC's Global Challenges Research Fund.

The objective of the ESRC GPID Research Network is to build a new research programme that focuses on the relationship between structural change and inclusive growth.

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**THE DEVELOPER'S DILEMMA**

The ESRC Global Poverty and Inequality Dynamics (GPID) research network is concerned with what we have called 'the developer's dilemma'.

This dilemma is a trade-off between two objectives that developing countries are pursuing. Specifically:

1. Economic development via structural transformation and productivity growth based on the intra- and inter-sectoral reallocation of economic activity.
2. Inclusive growth which is typically defined as broad-based economic growth benefiting the poorer in society in particular.

Structural transformation, the former has been thought to push up inequality. Whereas the latter, inclusive growth implies a need for steady or even falling inequality to spread the benefits of growth widely. The 'developer's dilemma' is thus a distribution tension at the heart of economic development.

## 1. Automation and developing countries

A broad range of international agencies have recently flagged such issues relating to the future of employment, and the consequences of automation and deindustrialization in their global reports (ADB, 2018; Hallward-Driemeier and Nayyar, 2017; ILO, 2017; IMF, 2017; UNCTAD, 2017; UNDP, 2015; UNIDO, 2016; World Bank, 2013, 2016) and the International Labor Organization (ILO) has launched a Global Commission on the Future of Work. Employment prospects have also come into sharp focus because of the contested experiences of "premature deindustrialization" (Palma, 2005; Rodrik, 2016) and weakening employment elasticities of growth.

There is currently significant and rising interest in these issues in the scholarly community (see e.g. Acemoglu & Restrepo, 2017; Arntz, Gregory, & Zierahn, 2016; Grace, Salvatier, Dafoe, Zhang, & Evans, 2017; Mishel & Bivens, 2017; Mokyr, Vickers, & Ziebarth, 2015; Roine & Waldenström, 2014), in the reports of international agencies (see references above), and in the private sector too (Frey, Osborne, & Holmes, 2016; McKinsey Global Institute, 2017a, 2017b; PWC, 2017; World Economic Forum, 2017). Moreover, the topic has also captured the public interest, reflected by a mushrooming of media reports and popular science books on the issues (e.g. Avent, 2017; Brynjolfsson & McAfee, 2011, 2014; Harari, 2016; Srnicek, 2017, to name but a few). Despite this increasing interest, the effects of automation in particular remain highly contestable and understudied with respect to developing economies, given that most research has focused on high-income Organisation for Economic Co-operation and Development (OECD) countries such as the United States.

These are, however, not only OECD country issues (see discussion of Ahmed, 2017). The World Bank (2016, p. 22f.) estimates that "the share of occupations that could experience significant automation is actually higher in developing countries than in more advanced ones, where many of these jobs have already disappeared". However, they note that the impact will be moderated by wage growth and the speed of technology adoption. There are numerous estimates of job displacement and much in the way of gray literature. However, these estimates are based on contestable assumptions and analysis of developing countries is often limited.

Furthermore, in contrast to a widespread narrative of technological unemployment, a more likely impact in the short-to-medium term at least is slow real-wage growth in low- and medium-skilled jobs as workers face competition from automation. This will itself hinder poverty reduction and likely put upward pressure on national inequality, weakening the poverty-reducing power of growth, and potentially placing the existing social contract under strain, or even possibly limiting the emergence of more inclusive social contracts. How developing countries should respond in terms of public policy is a crucial question, affecting not only middle-income developing countries, but even the very poorest countries given the automation trends in agriculture.

## How will automation effect developing countries?

Automation is likely to affect developing countries in different ways to the way automation affects high-income countries. The poorer a country is, the more jobs it has that are in principle automatable because the kinds of jobs common in developing countries—such as routine agricultural work—are substantially more susceptible to automation than the service jobs—which require creative work or face-to-face interaction—that dominate high-income economies. This matters because employment generation is crucial to spreading the benefits of economic growth broadly and to reducing global poverty.

The rise of a global 'robot reserve army' will have profound effects on labor markets and structural transformation in developing countries, but rather than causing mass unemployment, AI and robots are more likely

to lead to stagnant wages and deindustrialisation. As agricultural and manufacturing jobs are automated, workers will continue to flood the service sector, driving down wages. This will itself hinder poverty reduction and likely put upward pressure on national inequality, weakening the poverty-reducing power of growth, and potentially placing the existing social contract under strain, or even possibly limiting the emergence of more inclusive social contracts. How developing countries should respond in terms of public policy is a crucial question, affecting not only middle-income developing countries, but even the very poorest countries given the automation trends in agriculture.

Concerns about the effect of technology on jobs are not new to AI or automation. We argue that the current debate focuses too much on technological capabilities, and not enough on the economic, political, legal, and social factors that will profoundly shape the way automation affects employment. Questions like profitability, labor regulations, unionization, and corporate-social expectations will be at least as important as technical constraints in determining which jobs get automated, especially in developing countries.

Developing countries face several policy challenges unleashed by automation. Given the pace of technological change, upskilling strategies are likely not to be a panacea. Safety nets and wage subsidies may be desirable, but the question remains how to finance them (without making labor more costly and thus exacerbating a trend towards replacement). Investing in labor-heavy sectors such as infrastructure construction, social, education or healthcare provision may be a way for developing countries to manage disruptive impacts of automation though these would imply major public investments and do not in themselves substitute for a long run strategy for economic development.

## Conclusions

In conclusion, we would make three points. First, automation is challenging the competitive advantage of low-cost labor of late developers. Second, many developing countries have a vulnerable labor force in terms of wage stagnation and premature deindustrialization could loom. However, unemployment is not (yet) the problem. Third, we need to ask different policy and research questions and be concerned about the jobs impact of technology and the political economy of automation rather than just automatability in principle. In that vein the Lewis model and surplus labor theory could once more help us understand the dynamics of economic development and structural transformation.

***This brief is based on Schlogl and Sumner (2018).***

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