



Latin America Policy Journal

SHIFTING WINDS IN LATIN AMERICA

Seventh Edition
2018

A Harvard Kennedy School Student Publication

All views expressed in the Latin America Policy Journal are those of the authors or the interviewees only and do not represent the views of Harvard University, the John F. Kennedy School of Government at Harvard University, the staff of the Latin America Policy Journal, or any associates of the Journal.

All errors are authors' responsibilities.

© 2018 by the President and Fellows of Harvard College.
All rights reserved. Except as otherwise specified, no article or portion herein is to be reproduced or adapted to other works without the expressed written consent of the editors of the Latin America Policy Journal.

Is Latin America Ready for the Technological Tsunami?

By Isabel Guerrero and Sandra Naranjo

The pace of technological innovation is accelerating exponentially, and it seems that we are rapidly reaching the world of the Jetsons. Cars that do not need drivers, robots that obey our requests and turn on the music we want to listen to or order the food we want to eat. Google has just released hearing aids that allow for simultaneous translation. Uber and the Brazilian firm, Embraer, signed an agreement for the development of electric-powered cars. In the warehouses of Alibaba, the largest Chinese retail company in the world, most of the work is done by robots, who have replaced 70% of the staff.¹ Sophia became the first humanoid robot in the world with recognized citizenship in Saudi Arabia. It is a robot capable of imitating more than 60 gestures and human expressions, it was designed to express emotions and empathy, and to interact and hold a conversation.²

The technological revolution will have an impact 3,000 times greater than the industrial revolution.³ This opens up endless possibilities, but it is also an earthquake that will shake up the labor market. This earthquake, which we are already living, will bring sequels, say a tsunami, which will change the nature of work as we know it. We know this from the experience of the industrial revolution. If the industrial revolution was an earthquake of five-degree magnitude, this technological revolution that we are experiencing is at least a 10. In the period of industrialization, great benefits were generated for society through improvements in the quality of life and productivity, greater efficiency, and comfort. However, there were large costs generated by these changes, including lower income in the

agricultural sector, unemployment, and an increase in inequality between the countryside and the city.

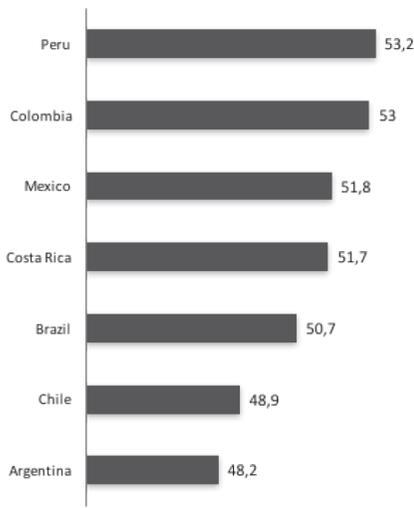
The second machine age, as defined by MIT, is disrupting the labor market through its impact on the types of jobs, wages, and skills required.⁴ This is the tsunami that comes after the earthquake. On the one hand, there are workers who can be replaced by robots; this will happen especially in those tasks that are repetitive and can be automated. In Latin America, half the workers in the region could be automated, with greater proportions in manufacturing, tourism, and agriculture (see Figure 1).⁵ On the other hand, there are the new jobs that will be created, such as those that did not exist until very recently: social network managers, engineers for the development of driverless cars, Uber drivers, analysts of big data, drone operators, and virtual reality film makers, among others.

Those jobs that require creativity, social, and non-cognitive skills will be difficult to replace. Similarly, there will be greater demand for everything that is inherently human, which demands personal interaction and social intelligence such as the care of sick people, negotiation processes, or persuasion. The so-called “soft skills” will be highly desirable in the training of new professionals.

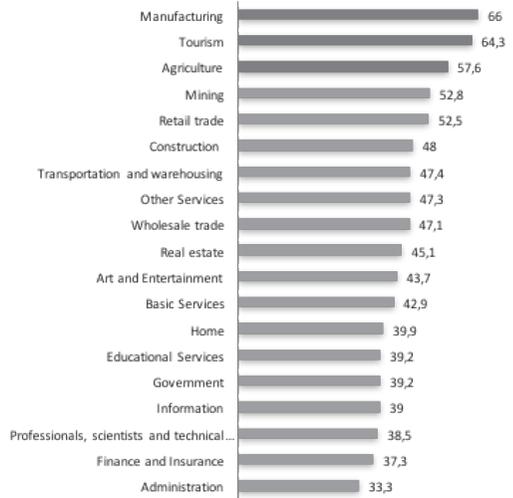
New technologies also generate changes in the characteristics of new jobs. There is greater flexibility in terms of time and the type of employment. AirBnB, for example, has thousands of self-employed workers. Geographical distances will be less and

Figure 1: Percentage of total full time equivalent (FTE), 2016

FTEs technically feasible for automation in Latin America



FTEs technically feasible for automation, by sector



Source: Cadena, A. et al (2017). Where will Latin America Growth Come From? Discussion paper. McKinsey Global Institute.

less important, with the use of virtual platforms to facilitate the connection between collaborators or the hiring of professionals around the world through platforms such as Upwork or Fiverr. Even traditional means of payment today present alternatives that we could not have imagined possible, such as mobile money, which is already being used in 19 countries in Latin America, and that has been especially successful in El Salvador, Honduras, and Paraguay.⁶

In sum, we expect to see a polarized labor market. There will be demand for people with high specialization and knowledge. There will also be demand for manual labor with low wages. The challenge, both for the public and the private sector, are the people who are in the middle, whose routine work will be easily replaced by robots and artificial intelligence. This includes tellers, translators, lawyers, accountants, etc.

The positive effects and opportunities that this technological tsunami may

generate for the region will depend to a large extent on our ability to respond, anticipate, and prepare for a reality which is already here. Adapt or die.

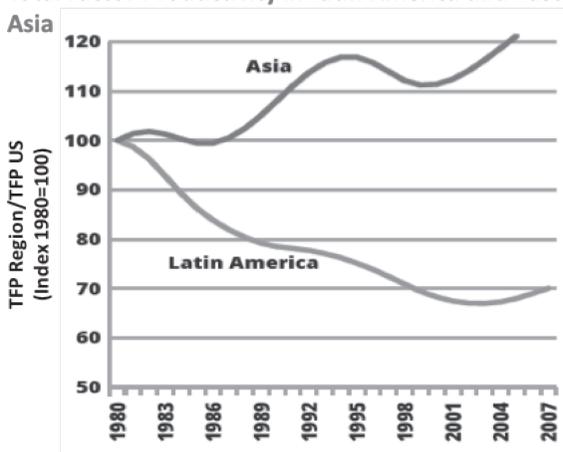
PREPARING FOR THIS TSUNAMI

What Can We Learn from Asia?

Latin America’s capacity for forecasting and long-term planning has been weak, and it diminishes its ability to generate the changes required to face this technological earthquake and prepare for the tsunami that is coming in the labor market. Perhaps one of the flaws is precisely our planning horizon. While we continue talking about the Latin American decade, Asia is thinking about how to reach the maximum potential of the “Asian century.”

The Asian Development Bank published a study on the vision of Asia to 2050, with the objective of taking actions to maintain the momentum for the next 40 years, adapting to a changing global economic

Figure 2
Total Factor Productivity in Latin America and East Asia



Source: Bitar, Sergio (2016). Why and How Latin America Should Think About the Future The Dialogue, Global Trends Report

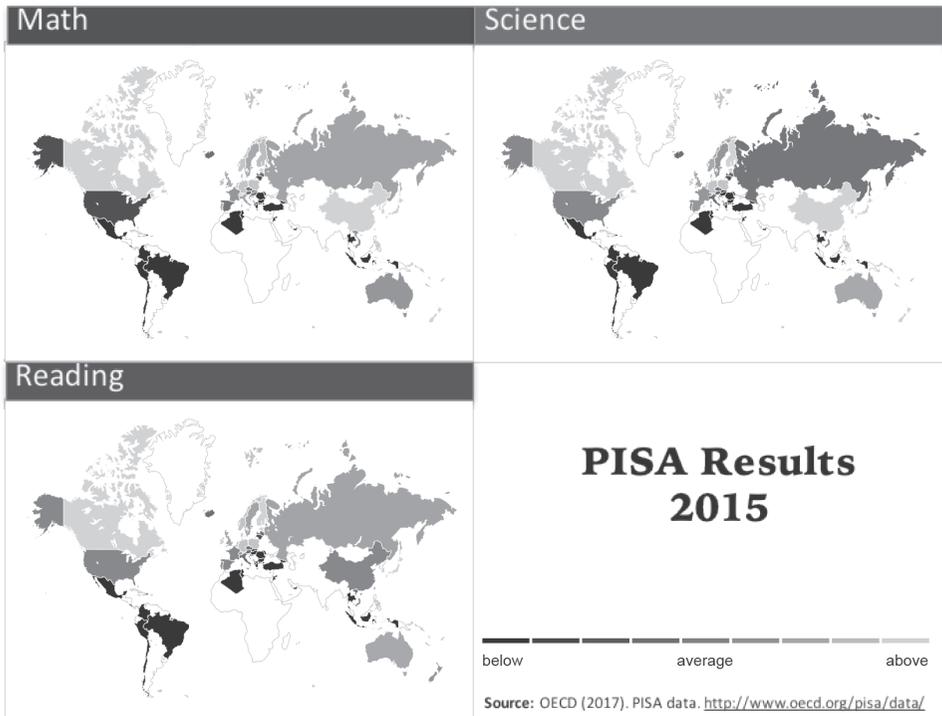
environment.⁷ The pessimistic scenario of the publication, which seeks to stir regional leaders into action, is for Asia to follow the Latin American path of the last 30 years, the middle-income trap. They see Latin America as not very dynamic, with low levels of investment, modest increases in productivity, shyness to carry out long-term projects, excessive inequality, and a lack of pragmatism in its debates about the role of the state and the market, where ideology predominates.⁸ They point out that the intangible assets for the future of the Asian region include: the ability of its leaders to focus on the long term, the commitment to modernize governments and their institutions, the ability of their citizens to think in a pragmatic and non-ideological way, and the strength of regional integration. A clear illustration of the different time horizon is that the long-term document of Latin America was published in 2016 for the next 15 years; Asia did it for a horizon of 40 years, and it includes inter-generational actions.⁹ This contrast of vision, and of ambition, has translated into great differences in productivity and growth.

The main challenge of our region continues to be increasing productivity levels, which directly affects growth rates. Compared with other developing regions, Latin America had the worst economic performance in the last 15 years, measured by the GDP growth rate. It reached barely 2.9 percent, while the average of developing regions was 5.6 percent, in China 9.4 percent, and in Southeast Asia 6.7 percent. The decomposition of growth shows us that technology has played a key role. While 86 percent of Asia's productivity comes from technological changes, in Latin America this contribution is only 22 percent.¹⁰

In fact, between 2000 and 2015 in developing economies, productivity grew at 3.9 percent per year and GDP per capita increased by 4.2 percent. During the same period in Latin America, growth was only 0.6 percent and 1.6 percent respectively.¹¹ Figure 2 shows how the productivity gap between Latin America and Asia continues to grow. There is no time to lose.

The long-term vision of Asia would seem to be even more ambitious for the coming

Figure 3



Source: OECD (2017). PISA data. <http://www.oecd.org/pisa/data/>

years. They aspire to go from a model of “equalizing” developed countries to one where they become the global benchmark, with breakthrough actions in science and technology.¹² What is the long-term vision of Latin America?

Education is Latin America’s Best Bet

Education is the main instrument to face the challenges of the region, including increasing productivity. Human talent and the knowledge economy open up an infinite number of possibilities for the region that can be exploited by generating the right conditions. We are just facing the first battles, well behind other developing regions.

Our young people are at a disadvantage. Although the last 15 years have seen an increase in enrollment, 31 percent of young people have not completed high school

and are not studying.¹³ Even attending, and in the best of cases completing secondary studies, is insufficient due to the low quality of education. If we compare the results of the PISA tests, the countries of Latin America are in the bottom third, while Asian countries occupy the top places (Figure 3).¹⁴

It is striking, for example, that South Korea has the same number of students enrolled in universities in the United States as Latin America, with 10 times less population than our region.¹⁵ The curricula in Asia are constantly looking to educate their citizens to face the challenges of modern society, with an emphasis on science and technology. From elementary school, mathematics and science are the main focus of schools in South Korea, Japan, Hong Kong, and Singapore. These countries are consistently placed among the highest ranks in math and science tests and are early precursors to the famous

STEM – Science, Technology, Engineering and Mathematics.¹⁶

STEM was considered for a long time as the great objective to prepare for the labor market of the future. But the speed of technological change and the progress in the learning capacity of artificial intelligence, such as Google Brain, suggest that the type of work that will be relevant in the future is different from what was expected when STEM was created.

A recent study by Harvard University shows that workers with both social and technical competences, not only technical ones, are in the highest demand in the labor market, and their income per hour has increased the most.¹⁷ In the United States between 1980 and 2012, the proportion of jobs that require high social interaction have increased by 12 percentage points, while those jobs that are intensive in mathematics, but with less social interaction – including several of the STEM occupations – have fallen by 3 percentage points over the same period. The importance of social competencies is already evident.

New, unprecedented categories of work will be necessary around essentially human qualities, reinforcing the trend of recent years. These include coaches for artificial intelligence empathy, translators/interpreters between the technological world and human users, and ombudsmen to uphold the norms of human values and morals.

Art and solidarity are also going to be central, however, because they are not replaceable by artificial intelligence. That is where Latin America has an opportunity to leapfrog ahead of Asia, into the future.

We may start by using the imagination of Borges, Cortázar, and García Márquez, to imagine a future that is currently

unpredictable, but that we know is closer than we thought. Latin America not only has the advantage of a creative tradition, but it also has great strength in terms of social capital and the capacity for warm empathy that will be needed more than ever in the world of the Jetsons.

We think that this is an issue of vital importance for the future of Latin America and that we are working against the clock. The technological earthquake is already here, and we have little time to prepare for the tsunami that is about to hit the labor market. We think that this is a great opportunity for the technological transformation to be an ally for the productive takeoff of Latin America. We do not have the solutions. Those require imagination and debate. But with this article we want to invite you to a conversation on this subject, hoping that the young people contribute in an important way.¹⁸ The future is now!

NOTES

¹ Jasper Pickering, “Take a Look Inside Alibaba’s Smart Warehouse Where Robots do 70% of the Work,” *Business Insider*, 19 September 2017, <http://uk.businessinsider.com/inside-alibaba-smart-warehouse-robots-70-per-cent-work-technology-logistics-2017-9>.

² “Robot Sophia Speaks at Saudi Arabia’s Future Investment Initiative” (video), *Arab News*, 25 October 2017, <https://www.youtube.com/watch?v=dMrXo8PxUNY>.

³ According to the McKinsey Global Institute in “Artificial Intelligence,” *The Economist*, 25 June 2016, <https://learn-more.economist.com/story/57ad9e19c55e9fia609c6bb4.pdf>.

⁴ Erik Brynjolfsson and Andrew McAfee, *The Second Machine Age: Work, Progress, and Prosperity in a Time of Brilliant Technologies* (New York: W.W. Norton & Company, 2014).

⁵ Andrés Cadena et al., “Where Will Latin America’s Growth Come From?,” McKinsey Global Institute Discussion Paper, April 2017.

⁶ Gabriela Barrera, “Existen 15 millones de cuentas de dinero móvil en América Latina,” 29 June 2015, Cobis Blog, <http://blog.cobiscorp.com/existen-15-millones-de-cuentas-de-dinero-movil-en-america-latina>.

⁷ Asian Development Bank, “Asia 2050: Realizing the Asian Century,” August 2011, <https://www.adb.org/publications/asia-2050-realizing-asian-century>.

- ⁸ Sergio Bitar, “Why and How Latin America Should Think About the Future,” *The Dialogue Global Trends Report*, September 2016, <http://www.thedialogue.org/wp-content/uploads/2016/08/IAD10150-2016-Global-Trends-Report-08.29.16-FINAL-Sept.pdf>.
- ⁹ Jason Marczak et al., “Latin America and the Caribbean 2030: Future Scenarios,” Interamerican Development Bank and the Atlantic Council, December 2016, <http://publications.atlanticcouncil.org/lac2030/wp-content/uploads/2016/11/LAC2030-Report-VersionNov30-ForWeb.pdf>.
- ¹⁰ Cadena et al., “Where Will Latin America Growth Come From?”
- ¹¹ Cadena et al., “Where Will Latin America Growth Come From?”
- ¹² Asian Development Bank, “Asia 2050: Realizing the Asian Century.”
- ¹³ OECD/ECLAC/CAF, “Latin American Economic Outlook 2017: Youth, Skills and Entrepreneurship,” 29 October 2016, <https://www.oecd.org/publications/latin-american-economic-outlook-20725140.htm>.
- ¹⁴ Program of International Student Assessment (PISA) is a triennial international survey that aims to evaluate education systems worldwide by testing the skills and knowledge of 15-year-old students.
- ¹⁵ Bitar, “Why and How Latin America Should Think About the Future.”
- ¹⁶ STEM is a program that was prepared by both Presidents Bush and Obama to prepare its citizens for the 21st century.
- ¹⁷ David Deming, “The Growing Importance of Social Skills in the Labor Market,” NBER Working Paper no. 21473, August 2015, <https://www.nber.org/papers/w21473>.
- ¹⁸ This article also relied on the following publications: Hasan Bakshi et al., *The Future of Skills: Employment in 2030* (London: Pearson and Nesta, 2017); “Sophia, la robot que tiene más derechos que las mujeres en Arabia Saudita,” *BBC Mundo Tecnología*, 30 October 2017, <http://www.bbc.com/mundo/noticias-41803576>; Gustavo Beliz, “Beyond Borders: The Future of Work in Latin America,” Interamerican Development Bank, 2017; Carl Benedikt and Michael Osborne, *The Future of Employment: How Susceptible are Jobs to Computerization?* (Oxford: Oxford University Programme, 2013); Jorge Familiar, “Time is Now to Build Future for Latin America and the Caribbean,” World Bank, 11 May 2017, <http://www.worldbank.org/en/news/opinion/2017/05/11/time-is-now-to-build-future-for-latin-america-and-the-caribbean>; Arwa Mahdadi, “What jobs will still be around in 20 years? Read this to prepare for your future,” *The Guardian*, 26 June 2017, <https://www.theguardian.com/us-news/2017/jun/26/jobs-future-automation-robots-skills-creative-health>; ManpowerGroup, “A Skills Revolution: From Consumers of Work to Builders of Talent,” 2017, http://www.manpowergroup.co.uk/wp-content/uploads/2017/02/A-Skills-Revolution_Consumers-of-Work-to-Builders-of-Talent.pdf; James Manyika, “Technology, Jobs and the Future of Work,” McKinsey Global Institute Briefing Note, updated May 2017, <https://www.mckinsey.com/global-themes/employment-and-growth/technology-jobs-and-the-future-of-work>; José Salazar, “The future of work, employment and skills in Latin America and the Caribbean,” International Labor Organization, September 2016, http://www.ilo.org/caribbean/events-and-meetings/WCMS_544337/lang-en/index.htm; “The future of jobs,” *The Economist*, special report, 10 September 2011; “The onrushing wave,” *The Economist*, 18 January 2014; H. James Wilson et al., “Companies Are Reimagining Business Processes With Algorithms,” *Harvard Business Review*, 8 February 2016, <https://hbr.org/2016/02/companies-are-reimagining-business-processes-with-algorithms>.



Isabel Guerrero



Sandra Naranjo

Isabel Guerrero is an economist that has worked in development all her professional life, driven to change the world in which she lives. She started as a macro economist, designing policy reforms from the World Bank adjustment operations in Philippines, Morocco and the Former Soviet Union. Between 1997 and 2008, Isabel was sequentially a Country Director for Bolivia, Ecuador, Paraguay, Peru, Colombia, Mexico and India. In that capacity she designed the World Bank Country Strategies for each of these countries, covering a wide range of sectors, including infrastructure, social development, environment, private sector development, rural development and livelihood programs, the financial sector, macroeconomics and trade policy. Between 2008 and 2013 she was the Vice-President for the South Asia region at the World Bank. Isabel co-founded IMAGO Global Grassroots in April 2014, a non-profit that works with organizations at the Base of the Pyramid to help them scale up. She is a Council Member of the United Nations University and a Board member of the Presencing Institute at MIT.

Sandra Naranjo, an Ecuadorian national, has extensive public sector and leadership experience. From 2007 to 2017 Sandra worked in the Ecuadorian government as acting Vice President, Minister of Planning and Development, Minister of Tourism and Chief of Administration in the President's Executive Office. She also has a rich international perspective, having worked for the World Bank in Kenya and Indonesia. She specializes in implementation, public sector efficiency and public financial management. Sandra holds a Bachelor in Economics and Finance with a Minor in Mathematics from Universidad San Francisco de Quito and a Master in Public Administration and International Development from Harvard University.