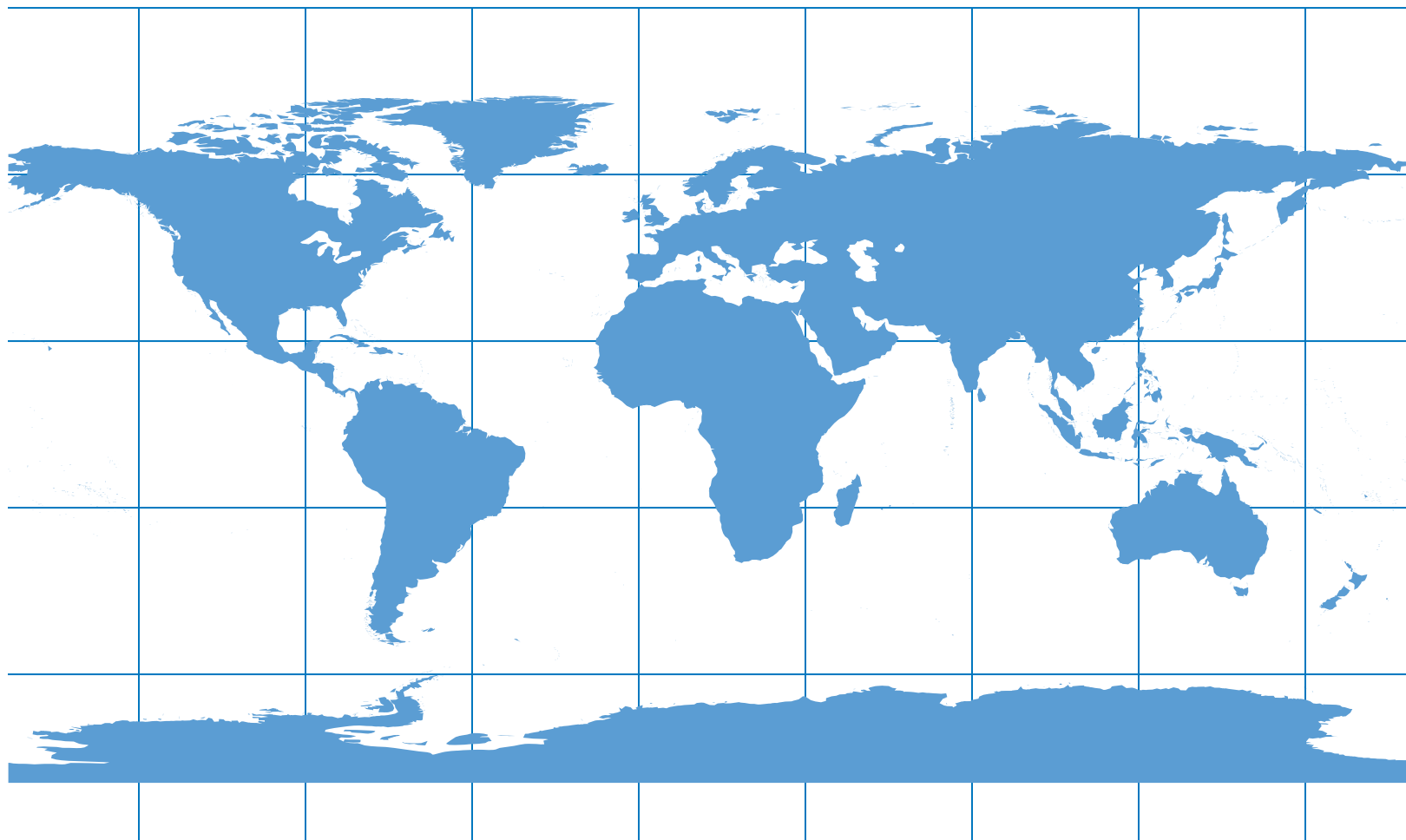


Department of Economic and Social Affairs

World Economic and Social Survey 2018

Frontier technologies for sustainable development



United Nations
New York, 2018

Bibliography

A

- Acemoglu, Daron (2000). Labor- and capital-augmenting technical change. *NBER Working Paper*, No. 7544. Cambridge, Massachusetts: National Bureau of Economic Research.
- _____, and David Autor (2011). Skills, tasks and technologies: Implications for employment and earnings. *Handbook of Labor Economics*, vol. 4B, chap. 12, pp. 1043–1171.
- Acemoglu, Daron, and Pascual Restrepo (2017). Robots and jobs: Evidence from US labor markets. *NBER Working Paper*, No. 23285. Cambridge, Massachusetts: National Bureau of Economic Research.
- _____. (2018a). Artificial intelligence, automation and work. *NBER Working Paper*, No. 24196. Cambridge, Massachusetts: National Bureau of Economic Research.
- _____. (2018b). The race between machine and man: implications of technology for growth, factor shares and employment. *American Economic Review*, vol. 108, No. 6 (June), pp. 1488–1542.
- Acemoglu, Daron, and James A. Robinson (2000). Political losers as a barrier to economic development. *American Economic Review*, vol. 90, No. 2 (May), pp.126–130.
- Association for Computing Machinery (ACM) US Public Policy Council (USACM) (2017). Statement on algorithmic transparency and accountability. Washington, D.C., 12 January.
- Agrawal, Ajay, Christian Catalini and Avi Goldfarb (2014). Some simple economics of crowdfunding. *NBER Innovation Policy and the Economy*, vol. 14, No. 1 (January), pp. 63–97.
- Ahlborg, Helene, and Linus Hammar (2014). Drivers and barriers to rural electrification in Tanzania and Mozambique: grid extension, off-grid, and renewable energy technologies. *Renewable Energy*, vol. 61 (January), pp.117–124.
- Aker, Jenny C., and Marcel Fafchamps (2015). Mobile phone coverage and producer markets: evidence from West Africa. *World Bank Economic Review*, vol. 29, No. 2 (January), pp. 262–292. Available at <https://academic.oup.com/wber/article-abstract/29/2/262/1661486?redirectedFrom=fulltext>.
- Aker, Jenny C., Christopher Ksoll and Travis J. Lybbert (2012). Can mobile phones improve learning? evidence from a field experiment in Niger. *American Economic Journal: Applied Economics*, vol. 3, No. 4 (October), pp. 94–120. Available at <https://www.aeaweb.org/articles?id=10.1257/app.4.4.94>.
- Ali, Feroz, and Sudarsan Rajagopal (2017). How India rejects bad patents. *Hindu*, 27 December. Available at <http://www.thehindu.com/opinion/op-ed/how-india-rejects-bad-patents/article22282403.ece>.
- Alvaredo, Facundo, and others (2018). *World Inequality Report 2018*. Developed by World Inequality Lab, Paris School of Economics. Available at <http://wir2018.wid.world/>.

- Angwin, Julia, and Terry Parris, Jr. (2016). Facebook lets advertisers exclude users by race. ProPublica. 26 October. Available at www.propublica.org/article/facebook-lets-advertisers-exclude-users-by-race.
- Angwin, Julia, Ariana Tobin and Madeleine Varner (2017). Facebook (still) letting housing advertisers exclude users by race. ProPublica. 21 November. Available at <https://www.propublica.org/article/facebook-advertising-discrimination-housing-race-sex-national-origin>.
- Angwin, Julia, and others (2016). Machine bias. ProPublica. 23 May. Available at <https://www.propublica.org/article/machine-bias-risk-assessments-in-criminal-sentencing>.
- Arntz, Melanie, Terry Gregory and Ulrich Zierahn (2016). The risk of automation for jobs in OECD countries: a comparative analysis. *OECD Social, Employment and Migration Working Paper*, No. 189. Paris: OECD.
- Aron, Jacob (2015). Forget the Turing test: there are better ways of judging AI. *New Scientist*, Technology news. September 21, 2015. Available at www.newscientist.com/article/dn28206-forget-the-turing-test-there-are-better-ways-of-judging-ai/.
- Arpaia, Alfonso, Esther Pérez and Karl Pichelmann (2009). *Understanding Labour Income Share Dynamics in Europe. European Economy Economic Paper*, No. 379 (May). Brussels: European Commission Directorate-General for Economic and Financial Affairs.
- Artificial Intelligence Index (2017) *2017 Annual Report*. November. Available at <https://aiindex.org>.
- Atkin, David, and others (2017). Organizational barriers to technology adoption: evidence from soccer-ball producers in Pakistan. *Quarterly Journal of Economics*, vol. 132, No. 3 (1 August), pp. 1101–1164.
- Aubert, Jean-Eric (2005). Promoting innovation in developing countries: a conceptual framework. World Bank Policy Research Working Paper, No. 3554. Washington, D.C.
- Aubin, Charlotte (2018). Accelerating Africa's energy transition. Project Syndicate, 11 January. Available at <https://www.project-syndicate.org/commentary/africa-renewables-solar-economic-incentives-by-charlotte-aubin-2018-01>.
- Aunemo, Helga (2015). *Implementing Off-Grid Solar Solutions in Southeast Asia. A CSR-based Approach to Rural Development*. Trondheim, Norway: Norwegian University of Science and Technology. July.
- Autor, David H. (2015). Why are there still so many jobs? the history and future of workplace automation. *Journal of Economic Perspectives*, vol. 29, No. 3, (summer), pp. 3–30.
- _____, and David Dorn (2013). The Growth of low-skill service jobs and the polarization of the US labor market. *American Economic Review*, vol. 103, No. 5, pp. 1553–1597.
- Autor, David H., Lawrence F. Katz and Melissa S. Kearney (2006). The polarization of the U.S. labor market, *American Economic Review*, vol. 96, No. 2 (February), pp. 189–194.

- Autor, David H., Frank Levy and Richard J. Murnane (2003). The skill content of recent technological change: an empirical exploration. *Quarterly Journal of Economics*, vol. 118, No. 4, pp. 1279–1333.
- Autor, David, and others (2017). The fall of the labor share and the rise of superstar firms. *NBER Working Paper*, No. 23396. Cambridge, Massachusetts: National Bureau of Economic Research. May.
- Azadi, Hossein, and Peter Ho (2010). Genetically modified and organic crops in developing countries: a review of options for food security. *Biotechnology Advances*, vol. 28, No. 1 (January-February), pp. 160–168.

B

- Baidawi, Adam (2017). Australia powers up the world's biggest battery - courtesy of Elon Musk. *New York Times*, 30 November. Available at www.nytimes.com/2017/11/30/world/australia/elon-musk-south-australia-battery.html.
- Baker, Dean, Arjun Jayadev and Joseph Stiglitz (2017). *Innovation, Intellectual Property, and Development: A Better Set of Approaches for the 21st Century*. AccessIBSA: Innovation & Access to Medicines in India, Brazil & South Africa. July.
- Bala, Venkatesh, and Sanjeev Goyal (2001). Conformism and diversity under social learning. *Economic Theory*, vol. 17, No. 1 (January), pp. 101–120.
- Baldwin, Richard (2016). *The Great Convergence: Information Technology and the New Globalization*. Cambridge, Massachusetts: Belknap Press.
- Ball, Philip (2018). How afraid of human cloning should we be? *Guardian*, 25 January.
- Barry, Marie-Louise, Herman Steyn and Alan Brent (2011). Selection of renewable energy technologies for Africa: eight case studies in Rwanda, Tanzania and Malawi. *Renewable Energy*, vol. 36, No. 11 (November), pp. 2845–2852.
- Baumol, William J. (1986). Productivity growth, convergence, and welfare: what the long-run data show. *American Economic Review*, vol. 76, No. 5 (December), pp. 1072–1085.
- Beatty, John (2011). The European patent office 'Raising the Bar' initiative. *World Patent Information*, vol. 33, No. 4 (December), pp. 355–359. Available at www.sciencedirect.com/science/article/pii/S0172219011001001.
- Beaudry, Paul, David A. Greeny and Benjamin M. Sand (2013). The great reversal in the demand for skill and cognitive tasks. *NBER Working Paper*, No. 18901. Cambridge, Massachusetts: National Bureau of Economic Research. March.
- Behavioural Insights Team. 2016. *The Behavioural Insights Team Update Report 2016–17*. London.
- Bell, Alexander M., and others (2017). Who becomes an inventor in America? the importance of exposure to innovation. *NBER Working Paper*, No. 24062. Cambridge, Massachusetts: National Bureau of Economic Research. November.
- BenYishay, Ariel, and A. Mushfiq Mobarak (2014). Social learning and communication. *NBER Working Paper*, No. 20139. Cambridge, Massachusetts: National Bureau of Economic Research. May.

- _____ (2015). Social learning and incentives for experimentation and communication. *Review of Economic Studies*, 30 July.
- Benhabib, Jess, Jesse Perla and Christopher Tonetti (2017). Reconciling models of diffusion and innovation: a theory of the productivity distribution and technology frontier. *NBER Working Paper*, No. 23095. Cambridge, Massachusetts: National Bureau of Economic Research.
- BEPS Monitoring Group (2017). Comments on the tax challenges of digitalisation, submitted in response primarily to the request for inputs, part I, issued by the Task Force on the Digital Economy, set up under the G20/OECD project on Base Erosion and Profit Shifting (BEPS). 17 October. Available at <https://bepsmonitoringgroup.files.wordpress.com/2017/10/digital-economy.pdf>. Comments of all submitting organizations are contained in the document entitled *Tax Challenges of Digitalisation: Comments Received on the Request for Input: Part I*. 25 October. Available at www.oecd.org/tax/beps/tax-challenges-digitalisation-part-1-comments-on-request-for-input-2017.pdf.
- Berger, T., and C. Frey (2016). Structural transformation in the OECD: digitalisation, deindustrialisation and the future of work. *OECD Social, Employment and Migration Working Papers*, No. 193. Paris: OECD.
- Berman, Eli, and Stephen Machin (2000). Skill-biased technology transfer around the world. *Oxford Review of Economic Policy*, vol. 16, No. 1, pp. 12–22.
- Blair, Roger D., and Sokol D. Daniel (2013). Welfare standards in U.S. and E.U. antitrust enforcement. *Fordham Law Review*, vol. 81, No. 5, art. 12.
- Blomström, Magnus, and Ari Kokko (1998). Multinational corporations and spillovers. *Journal of Economic Surveys*, vol. 12, No. 3 (July), pp. 247–77.
- Bloom, Nicholas, and John Van Reenen (2007). Measuring and explaining management practices across firms and countries. *Quarterly Journal of Economics*, vol. 122, No. 4 (November), pp.1351–1408.
- Bond, Eric W., and Kamai Saggi (2016). Compulsory licensing and patent protection: a North-South perspective. *Economic Journal*, vol. 128, No. 610 (May), pp. 1157–1179.
- Brody, Ben (2018). Google topped peers in lobbying as Washington beat up tech. Bloomberg, 24 January. Available at <https://www.bloomberg.com/news/articles/2018-01-24/google-outspends-tech-rivals-on-washington-lobbying-in-2017>.
- Brousseau, Eric, Tom Dedeurwaerdere and Bernd Siebenhüner (2012). Knowledge matters: institutional frameworks to govern the provision of global public goods. In *Reflexive Governance and Global Public Goods*, Eric Brousseau, Tom Dedeurwaerdere and Bernd Sebenhüner, eds. Cambridge, Massachusetts: MIT Press. Chap. 13, pp. 243–282.
- Brown, Julia K., Tetyana Zelenska and Mushfiq A. Mobarak (2013). Barriers to adoption of products and technologies that aid risk management in developing countries. Background paper prepared for *World Development Report 2014*.

- Bruckner, Matthias, Marcelo LaFleur and Ingo Pitterle (2017). The Impact of the technological revolution on labour markets and income distribution. *Frontier Issues*. Department of Economic and Social Affairs of the United Nations Secretariat. Available at www.un.org/development/desa/dpad/publication/frontier-issues-artificial-intelligence-and-other-technologies-will-define-the-future-of-jobs-and-incomes/.
- Bruckner, Thomas, and others (2014). Energy systems. In *Climate Change 2014: Mitigation of Climate Change*. Working Group III Contribution to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change, Ottmar Edenhofer and others, eds., Cambridge, United Kingdom: Cambridge University Press
- Bryane, Michael (2013). Emerging market winners and losers in manufacturing. IEMS Emerging Market Brief, vol. 13-06 (August). Moscow School of Management (SKOLKOVO) Institute for Emerging Market Studies (IEMS).
- Brynjolfsson, Erik (2011). ICT, innovation and the e-economy. *EIB Papers*, vol. 16, No. 2, pp. 60–76. Luxembourg: European Investment Bank.
- _____, and Andrew McAfee (2011). *Race against the Machine: How the Digital Revolution is Accelerating Innovation, Driving Productivity, and Irreversibly Transforming Employment and the Economy*. Lexington, Massachusetts: Digital Frontier Press.
- _____. (2014). *The Second Machine Age: Work, Progress, and Prosperity in a Time of Brilliant Technologies*. New York: W.W. Norton.
- _____. (2017). The business of artificial intelligence. *Harvard Business Review*. July 2017.
- Bugaje, I.M. (2006). Renewable energy for sustainable development in Africa: a review. *Renewable and Sustainable Energy Reviews*, vol. 10, No. 6 (December), pp. 603–612.
- Burrone, Esteban (n.d.). Standards, intellectual property rights (IPR) and standards-setting process. Geneva: World Intellectual Property Organization. Available at http://www.wipo.int/sme/en/documents/ip_standards_fulltext.html.

C

- Campolo, Alex, and others (2017). *AI Now 2017 Report*. New York: AI Now Institute, New York University.
- Chakravorti, Bhaskar, and Ravi Shankar Chaturvedi (2017). *Digital Planet 2017: How Competitiveness and Trust in Digital Economies Vary Across the World*. Medford, Massachusetts: Institute for Business in the Global Context, Fletcher School. Tufts University. July.
- Cirera, Xavier, and William F. Maloney (2017). *The Innovation Paradox: Developing-Country Capabilities and the Unrealized Promise of Technological Catch-Up*. Washington, D.C.: World Bank.
- Citi GPS and Oxford Martin School (2017). *Technology at Work v3.0. Automating e-Commerce from Click to Pick to Door*. August.

- Ciurzyńska, Agnieszka, and Andrzej Lenart (2011). Freeze-drying: application in food processing and biotechnology – a review, in *Polish Journal of Food and Nutrition Sciences*, vol. 61, No. 3, pp. 165–171.
- Cohn, Pamela, and others (2017). Commercial drones are here: the future of unmanned aerial systems. McKinsey & Company. Available at www.mckinsey.com/industries/capital-projects-and-infrastructure/our-insights/commercial-drones-are-here-the-future-of-unmanned-aerial-systems.
- Collumbien, Martine, Makeda Gerressu and John Cleland (2004). Non-use and use of ineffective methods of contraception. In *Comparative Quantification of Health Risks: Global and Regional Burden of Disease Attributable to Selected Major Risk Factors*, Majid Ezzati and others, eds. Geneva: World Health Organization. Vol. 2, chap. 15.
- Comin, Diego, and Bart Hobijn (2004). Cross-country technology adoption: making the theories face the facts. *Journal of Monetary Economics*, vol. 51, No. 1 (January), pp. 39–83.
- _____ (2010). An exploration of technology diffusion. *American Economic Review*, vol. 100, No. 5 (December), pp. 2031–2059.
- Comin, Diego, and Martí Mestieri Ferrer (2010). The intensive margin of technology adoption. Harvard Business School Working Paper, No. 11-206.
- _____ (2013). If technology has arrived everywhere, why has income diverged? *NBER Working Paper*, No. 19010. Cambridge, Massachusetts: National Bureau of Economic Research.
- _____ (2014). Technology diffusion: measurement, causes, and consequences. In *Handbook of Economic Growth*, vol. 2, Philippe Aghion and Steven Durlauf, eds. Pp. 565–622.
- Conley, Timothy G., and Christopher R. Udry (2010). Learning about a new technology: pineapple in Ghana. *American Economic Review*, vol. 100, No. 1 (March), pp. 35–69.
- Conte, Andrea, and Marco Vivarelli (2011). Imported skill-biased technological change in developing countries. *Developing Economies*, vol. 49, No. 1 (March), pp. 36–65.
- Cortez, Ana Luiza, and Mehmet Arda (2015). Global trade rules for supporting development in the post-2015 era. In *Global Governance and Rules for the Post-2015 Era: Addressing Emerging Issues in the Global Environment*, Jose Antonio Alonso and José Antonio Ocampo, eds. New York: Bloomsbury.
- Crescenzi, Riccardo, and Andrés Rodríguez-Pose (2017). The geography of innovation in China and India. *International Journal of Urban and Regional Research*, vol. 41, No. 6 (November), pp. 1010–1027.

D

- Daar, Abdallah S., and others (2007). How can developing countries harness biotechnology to improve health? *BMC Public Health*, vol. 7, No. 1 (February), pp. 1–9.

- Derviş, K. (2012). World economy convergence, interdependence, and divergence: growth in emerging market and developing economies is less dependent on advanced economies over the long run, but in the short run they dance together. *Finance and Development*, vol. 49, No. 3 (September), pp. 10–14.
- Diouf, Boucar, and Ramchandra Pode (2015). Potential of lithium-ion batteries in renewable energy. *Renewable Energy*, vol. 76 (April), pp. 375–380.
- Domingos, Pedro (2015). *The Master Algorithm: How the Quest for the Ultimate Learning Machine Will Remake Our World*. New York: Basic Books.
- Dormehl, Luke (2017). *Thinking Machines. The Quest for Artificial Intelligence and Where It's Taking Us Next*. New York: Tarcher Perigee.
- Dosi, Giovanni, Luigi Marengo and Corrado Pasquali (2007). Knowledge, competition and innovation: is strong IPR protection really needed for more and better innovations? *Michigan Telecommunications and Technology Law. Review*, vol. 13, No. 2.

E

- The Economist* (2015). Africa: a brightening continent – solar is giving hundreds of millions of Africans access to electricity for the first time. 17 January. Available at <https://www.economist.com/special-report/2015/01/15/a-brightening-continent>.
- _____ (2017). 3D printers start to build factories of the future. 29 June. Available at <https://www.economist.com/briefing/2017/06/29/3d-printers-start-to-build-factories-of-the-future>.
- El-Bermawy Mostata M. (2016). Your filter bubble is destroying democracy. *Wired* opinion. Available at <https://www.wired.com/2016/11/filter-bubble-destroying-democracy/>.
- Ellabban, Omar, Haitham Abu-Rub and Frede Blaabjerg (2014). Renewable energy resources: current status, future prospects and their enabling technology. *Renewable and Sustainable Energy Reviews*, vol. 39 (November), pp. 748–764.
- Eller, Alex, and Dexter Gauntlett (2017). *Energy Storage Trends and Opportunities in Emerging Markets*. Conference edition report, commissioned by International Finance Corporation, World Bank Group; and Energy Sector Management Assistance Program. Boulder, Colorado: Navigant Consulting. Available at <https://www.ifc.org/wps/wcm/connect/ed6f9f7f-f197-4915-8ab6-56b92d50865d/7151-IFC-EnergyStorage-report.pdf?MOD=AJPERES>.
- Eubanks, Virginia (2018). *Automating Inequality: How High-Tech Tools Profile, Police, and Punish the Poor*. New York: St. Martin's Press.
- EUGDPR (n.d.). GDPR key changes: an overview of the main changes under GDPR and how they differ from the previous directive. Available at <https://www.eugdpr.org/key-changes.html>.
- European Commission (2016). Policy labs: innovative take of public administrations for better policies. EU Science Hub. Available at <https://ec.europa.eu/jrc/en/news/policy-labs-innovative-take-public-administrations-better-policies>.

- _____ (2018). 2018 reform of EU data protection rules: stronger rules on data protection mean people have more control over their personal data and businesses benefit from a level playing field. Available at https://ec.europa.eu/commission/priorities/justice-and-fundamental-rights/data-protection/2018-reform-eu-data-protection-rules_en. www.eugdpr.org/key-changes.html.
- Ezrachi, Ariel, and Maurice E. Stucke (2016). *Virtual Competition: The Promise and Perils of the Algorithm-Driven Economy*. Cambridge, Massachusetts: Harvard University Press.

F

- Fagerberg, Jan, and Manuel M. Godinho (2006). Innovation and catching-up. In *The Oxford Handbook of Innovation*, Jan Fagerberg and David C. Mowery, eds. Oxford: Oxford University Press.
- Falcão, Tatiana (2018a). New technologies and international tax cooperation. Background Paper prepared for *World Economic and Social Survey 2018*.
- _____ (2018b). Taxing the digital economy: policy considerations and how to advance the debate. *Tax Notes International*, 12 February 2018, p. 623.
- Feenstra, Robert, Robert Inklaar and Marcel Timmer (2015). The next generation of the Penn World Table. *American Economic Review*, vol. 105. No.10, pp. 3150–3182.
- Food and Agriculture Organization of the United Nations (FAO) (2011). *Biotechnologies for Agricultural Development: Proceedings of the FAO International Technical Conference on “Agricultural Biotechnologies in Developing Countries: Options and Opportunities in Crops, Forestry, Livestock, Fisheries and Agro-industry to Face the Challenges of Food Insecurity and Climate Change”*. Rome.
- Frey, Carl Benedikt, and Michael A. Osborne (2013). The future of employment: how susceptible are jobs to computerisation? Oxford: Oxford Martin School, University of Oxford. 17 September.
- Fu, Xiaolan, Carlo Pietrobelli and Luc Soete (2011). The role of foreign technology and indigenous innovation in the emerging economies: technological change and catching-up. *World Development*, vol. 39, No. 7 (July), pp.1204–1212.
- Fu, Xiaolan, and Jing Zhang. (2011). Technology transfer, indigenous innovation and leapfrogging in green technology: the solar-PV industry in China and India, *Journal of Chinese Economic and Business Studies*, vol. 9, No. 4, pp. 329–347.
- Fujii, Hemichi, and Shunsuke Managi (2017). Trends and priority shifts in artificial intelligence technology invention: a global patent analysis. RIETI Discussion Paper. No. 17-E-066. Tokyo: Research Institute of Economy, Trade and Industry.
- Fukase, Emiko, and Will Martin (2017). Economic growth, convergence, and world food demand and supply. World Bank Policy Research Working Paper, No. 8257. Washington, D.C.

- Furman, Jason, and others (2016). *Artificial Intelligence, Automation, and the Economy*. Washington, D.C.: Executive Office of the President of the United States. Available at <https://obamawhitehouse.archives.gov/sites/whitehouse.gov/files/documents/Artificial-Intelligence-Automation-Economy.PDF>.
- Future of Privacy Forum (2017). Unfairness by algorithm: distilling the harms of automated decision-making. Washington, D.C. Available at <https://fpf.org/2017/12/11/unfairness-by-algorithm-distilling-the-harms-of-automated-decision-making/>.

G

- Gal, Michal S. (2013). Merger policy for small and micro jurisdictions. In *More Pros and Cons of Merger Control*. Stockholm: Swedish Competition Authority.
- Gay, Daniel (2018). Pharmaceutical dreams: TRIPS and drugs policy in Bangladesh. Available at <https://emergenteconomics.com>.
- Gerschenkron, Alexander (1962). *Economic Backwardness in Historical Perspective: A Book of Essays*. Cambridge, Massachusetts: Belknap Press
- Ghosh, Jayati (2016). Ideas on the future of work. Presentation at a discussion organized by the International Labour Organization on the future of work and the implications of technology on jobs. YouTube. 5 February 2016. Available at www.youtube.com/watch?v=L5W-ijyzBMY.
- Goñi, Edwin, and William Maloney (2017). Why don't poor countries do R&D? varying rates of factor returns across the development process. *European Economic Review*, vol. 94, Issue C (May): pp. 126–147.
- Goos, Maarten, Alan Manning and Anna Salomons (2014). Explaining job polarization: routine-biased technological change and offshoring. *American Economic Review*, vol. 104, No. 8 (August), pp. 2509–2526.
- Görg, Holger, and Eric Strobl (2001). Multinational companies and productivity spillovers: a meta-analysis. *Economic Journal*, vol. 111, No. 475 (November), pp. F723–F739.
- Graedel, T. E., and others (2015). On the materials basis of modern society. *Proceedings of the National Academy of Sciences of the United States of America*, vol. 112, No. 20 (19 May), pp. 6295–6300.
- Graetz, Georg, and Guy Michaels (2015). Robots at work. CEPR Discussion Paper, No. 10477. London: Centre for Economic Policy Research. March.
- Gruber, Harald, and Pantelis Koutroumpis (2010). Mobile communications: diffusion facts and prospects. *Communications and Strategies*, No. 77, pp. 133–145.
- Guerreiro, Joao, Sergio Rebelo and Pedro Teles (2018). Should robots be taxed? *NBER Working Paper*, No. 23806. Cambridge, Massachusetts: National Bureau of Economic Research.
- Gupta, Sanjeev, and others (2017). *Digital Revolutions in Public Finance*. Washington, D.C.: International Monetary Fund.
- Gurib-Fakim, Ameenah, and Jacobus Nicolaas Eloff, eds. (2013). *Chemistry for Sustainable Development in Africa*. Heidelberg, Germany: Springer-Verlag.

H

- Haider, Alexander (2018). Potentials and perils of new technologies in poor and vulnerable countries on their path to sustainable development. Background paper prepared for *World Economic and Social Survey 2018*.
- Halberstam, Yosh, and Brian Knight (2014). Homophily, group size, and the diffusion of political information in social networks: evidence from Twitter. *NBER Working Paper*, No. 20681. Cambridge, Massachusetts: National Bureau of Economic Research. November.
- Hall, Bronwyn H. (2006). Innovation and diffusion. In *The Oxford Handbook of Innovation*, Jan Fagerberg and David C. Mowery, eds. Oxford: Oxford University Press.
- Hallward-Driemeier, Mary, and Gaurav Nayyar (2018). *Trouble in the Making? The Future of Manufacturing-Led Development*. Washington, D.C.: World Bank.
- Harney, Kenneth R. (2008). Zip code “redlining”: a sweeping view of risk. *Washington Post*. 2 February.
- Hausmann, Ricardo (2017). Making the future work for us. Project Syndicate, 29 September 29. Available at <https://www.project-syndicate.org/commentary/technology-future-of-work-by-ricardo-hausmann-2017-09>.
- Hawkins, Troy R., Ola Moa Gausen and Anders Hammer Strømman (2012). Environmental impacts of hybrid and electric vehicles: a review. *International Journal of Life Cycle Assessment*, vol. 17, No. 8 (September), pp. 997–1014. Available at <https://www.epa.gov/ghgemissions/understanding-global-warming-potentials>.
- Heacock, Michelle, and others (2016). E-waste and harm to vulnerable populations: a growing global problem. *Environmental Health Perspectives*, vol. 124, No. 5 (May), pp. 550–555.
- Helmy, Mohamed, Mohamed Awad and Kareem A. Mosa (2016). Limited resources of genome sequencing in developing countries: challenges and solutions. *Applied and Translational Genomics*, vol. 9 (Supplement C): pp. 15–19.
- Hempling, Scott (2014), “Regulatory capture”: sources and solutions. *Emory Corporate Governance and Accountability Review*, vol. 1, No. 1. Available at <http://law.emory.edu/ecgar/content/volume-1/issue-1/essays/regulatory-capture.html>.
- Henna, Rema, Sendhil Mullainathan and Joshua Schwartzstein (2014). Learning through noticing: theory and evidence from a field experiment. *Quarterly Journal of Economics*, vol. 129, No. 3 (1 August), pp. 1311–1353.
- Hidalgo, César A., and Ricardo Hausmann (2009). The building blocks of economic complexity. *Proceeding of the National Academy of Sciences of the United States of America*, vol. 106, No. 26 (30 June), pp. 10570–10575.
- Hindu* (2017). How India rejects bad patents. 27 December. Available at <http://www.thehindu.com/opinion/op-ed/how-india-rejects-bad-patents/article22282403.ece>.
- Hutchinson, John, and Damiaan Persyn (2012). Globalisation, concentration and footloose firms: in search of the main cause of the declining labour share. *Review of World Economics*, vol. 148, No. 1 (April), pp. 17–43.

I

- IEEE Global Initiative for Ethical Considerations in Artificial Intelligence and Autonomous Systems (2018). *Ethically Aligned Design: A Vision for Prioritizing Human Well-being with Autonomous and Intelligent Systems, Version 2*. Available at https://standards.ieee.org/develop/indconn/ec/autonomous_systems.html.
- Ince, David, Harrie Vredenburg and Xiaoyu Liu (2016). Drivers and inhibitors of renewable energy: a qualitative and quantitative study of the Caribbean, *Energy Policy*, vol. 98 (C), pp. 700–712.
- Innovations for Poverty Action (2011). Increasing demand for hygienic latrines in Bangladesh. Policy brief. New Haven, Connecticut.
- Intergovernmental Panel on Climate Change (IPCC) (2014a). *Climate Change 2014: Synthesis Report*. Contribution of Working Groups I, II and III to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change, Rajendra K. Pachauri and Leo Mayer, eds. Geneva. Available at www.ipcc.ch/pdf/assessment-report/ar5/syr/SYR_AR5_FINAL_full.pdf.
- _____ (2014b). Summary for Policymakers. In *Climate Change 2014: Mitigation of Climate Change*. Contribution of Working Group III to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change, O. Edenhofer and others, eds. Cambridge, United Kingdom: Cambridge University Press.
- International Council on Clean Transportation (2016). Proposed temporary management regulation for corporate average fuel consumption and new-energy vehicle credits for new passenger cars in China. Policy update. October, Available at http://www.theicct.org/sites/default/files/publications/China%20CAFC%20and%20NEV%20credits_policy-update_vF_06102016.pdf.
- International Energy Agency (IEA) (2016). *Global EV Outlook 2016: Beyond One Million Electric Cars*. Paris: OECD/IEA Available at https://www.iea.org/publications/freepublications/publication/Global_EV_Outlook_2016.pdf.
- _____ (2017). *Global EV Outlook 2017: Two Million and Counting*, Paris: OECD/IEA. Available at <https://www.iea.org/publications/freepublications/publication/GlobalEVO Outlook2017.pdf> (accessed on 17 November 2017).
- _____ (2018a). *Energy Access Outlook 2017: From Poverty to Prosperity*. Paris: OECD/IEA.
- _____ (2018b). *Global EV Outlook 2018: Towards Cross-modal Electrification*. Paris: OECD/IEA. Available at https://webstore.iea.org/download/direct/1045?filename=global_ev_outlook_2018.pdf.
- International Labour Organization (ILO) (2011). *World of Work Report 2011: Making Markets Work for Jobs*. Geneva: International Labour Office.
- _____ (2014). *World Social Protection Report 2014/15: Building Economic Recovery, Inclusive Development and Social Justice*. Geneva: International Labour Office.
- _____ (2015). *Global Wage Report 2014/15: Wages and Income Inequality*. Geneva: International Labour Office.

- _____ (2017). *World Employment and Social Outlook: Trends 2017*. Geneva: International Labour Office.
- _____ (2018). The impact of technology on the quality and quantity of jobs. Issue brief No. 6, prepared for the second meeting of the Global Commission on the Future of Work, 15–17 February 2018. Cluster 3: Technology for social, environmental and economic development.
- _____ and Organization for Economic Cooperation and Development (2015). The labour share in G20 economies. Report prepared for the G20 Employment Working Group. Antalya, Turkey, 26 and 27 February 2015.
- International Monetary Fund (IMF) (2016). *Fiscal Monitor April 2016: Acting Now, Acting Together*. Washington, D.C.
- _____ (2017). Understanding the downward trend in labor income shares (chap. 3), In *World Economic Outlook, April 2017: Gaining Momentum?* Washington, D.C.

J

- Jackson, Matthew O., Brian W. Rogers and Yves Zenou (2017). The economic consequences of social-network structure. *Journal of Economic Literature*, vol. 55, No. 1 (March), pp. 49–95.
- Jaffe, Adam. B. (2015). Technology diffusion. In *Emerging Trends in the Social and Behavioral Sciences: Interdisciplinary Directions*, Robert. A. Scott and Stephen. M. Kosslyn, eds. Thousand Oaks, California: SAGE Publications.
- Jambeck, Jenna R. (2017). Role of technology in reducing plastic waste and pollution. Background paper prepared for *World Economic and Social Survey 2018*.
- Jansen, Kees, and Aarti Gupta (2009). Anticipating the future: “biotechnology for the poor’ as unrealized promise? *iFutures* vol. 41, No. 7 (September), pp. 436–445.
- Jensen, Lars (2018). Digitally enabled financial services: how digital technology is driving financial inclusion. United Nations Development Programme, Bureau for Policy and Programme Support (BPPS) Strategic Policy Unit. December.
- Juma, Calestous, and Ismail Serageldin (2007). *Freedom to Innovate: Biotechnology in Africa’s Development*. Report of the High-level African Panel on Modern Biotechnology. Addis Ababa and Pretoria: African Union and New Partnership for Africa’s Development.

K

- Kahneman, Daniel (2011). *Thinking, Fast and Slow*. New York: Farrar, Straus and Giroux.
- Kamperman Sanders, Anselm (2018). International incentives and obstacles for technology creation and diffusion. Background paper prepared for *World Economic and Social Survey 2018*
- Karabarbounis, Loukas, and Brent Neiman (2013). The global decline of the labor share. *Quarterly Journal of Economics*, vol. 129, No. 1 (January), pp 61–103.

- Karachalios, Konstantinos (2017). Advancing technology for humanity: the human standard and artificial intelligence. IEEE Standards University. Available at <https://www.standardsuniversity.org/e-magazine/march-2017/advancing-technology-humanity-human-standard-artificial-intelligence/>.
- Kaufmann, Daniel, Aart Kraay and Massimo Mastruzzi (2011). The worldwide governance indicators: methodology and analytical issues. *Hague Journal on the Rule of Law*, vol. 3, No. 2 (June), pp. 220–246.
- Kaul, Inge, Isabelle Grunberg and Marc A. Stern, eds. (1999). *Global Public Goods: International Cooperation in the 21st Century*. New York: Oxford University Press. See www.oxfordscholarship.com/view/10.1093/0195130529.001.0001/acprof-9780195130522-Chapter-1.
- Kaul, Inge, and others (2003). Why do global public goods matter today. In *Providing Global Public Goods: Managing Globalization*. Oxford: Oxford University Press. Pp. 2–20.
- Kawamura, Hiroshi (2017). Significant uptake of electrical vehicles and its socio-economic and environmental impacts. Background paper prepared for *World Economic and Social Survey 2018*.
- Keller, Wolfgang (2004). International technology diffusion. *Journal of Economic Literature*, vol. 42, No. 3 (September), pp.752–782.
- Knowledge@Wharton (2017). What will happen if the FCC abandons net neutrality? 5 December. Available at <http://knowledge.wharton.upenn.edu/article/net-neutrality-debate/>.
- Koeniger, Winfried, Marco Leonardi and Luca Nunziata (2007). Labor market institutions and wage inequality. *ILR Review*, vol. 60, No. 3 (April), pp. 340–356.
- Korinek, Anton, and Joseph E. Stiglitz (2017). Artificial intelligence and its implications for income distribution and unemployment. *NBER Working Paper*, No. 24174. Cambridge, Massachusetts: National Bureau of Economic Research.
- Krause, Eleanor, and Isabel V. Sawhill (2017). What we know and don't know about declining labor force participation: a review. Washington, D.C.: Brookings Institution. May.
- Kshetri, Nir (2010). Diffusion and effects of cyber-crime in developing economies. *Third World Quarterly*, vol. 31, No. 7 (October), pp. 1057–1079.

L

- LaFleur, Marcelo, Kenneth Iversen and Lars Jensen (2018). Unlocking the potential of knowledge and technology for all. *Frontier Issues*. 1 April. Department of Economic and Social Affairs of the United Nations Secretariat.
- LaFleur, Marcelo, and Ingo Pitterle (2017). Global context for achieving the 2030 Agenda for Sustainable Development: Low growth with limited policy options? secular stagnation - causes, consequences and cures. Policy note. DSP Development Issues No. 9. 1 March. Available at <https://www.un.org/development/desa/dpad/publication/development-issues-no-9-low-growth-with-limited-policy-options-secular-stagnation-causes-consequences-and-cures/>.

- The Lancet* (2017). Artificial intelligence in health care: within touching distance. Correspondence. Vol. 390, No. 10114 (23 December).
- Lang, Jianlei, and others (2013). Energy and environmental implications of hybrid and electric vehicles in China. *Energies*, vol. 6, pp. 2662–2685.
- LaPointe, Cara (2018). The ethics of emerging technologies: an overview of key ethical implications of leveraging emerging technologies for sustainable development. Background paper prepared for *World Economic and Social Survey 2018*.
- Larsen, Peter Bjørn, Toni Ahlqvist and Karl Friðriksson (2009). Applying technology convergence for innovation in Nordic regions. Oslo: Nordic Innovation Centre.
- Larson, Selena (2017). Massive cyberattack targeting 99 countries causes sweeping havoc. CNN Tech Cyber-Safe. 13 May. Available at <http://money.cnn.com/2017/05/12/technology/ransomware-attack-nsa-microsoft/index.html>.
- Lee, Kai-Fu (2017). A blueprint for coexistence with AI. *WIRED*, 12, July. Available at www.wired.com/story/a-blueprint-for-coexistence-with-artificial-intelligence/.
- Lee, Kenneth, Edward Miguel and Catherine Wolfram (2016). Experimental evidence on the demand for and costs of rural electrification. *NBER Working Paper*, No. 22292. May. Available at <http://www.nber.org/papers/w22292.pdf>.
- Lee, Keun (2013). *Schumpeterian Analysis of Economic Catch-Up*. Cambridge, United Kingdom: Cambridge University Press.
- _____ (2016). *Economic Catch-up and Technological Leapfrogging: The Path to Development and Macroeconomic Stability in Korea*. Cheltenham, United Kingdom: Edward Elgar.
- _____, and John Mathews (2013). Science, technology and innovation for sustainable development. CDP Background Paper, No. 16 (April). ST/ESA/2013/CDP/16. Prepared as an input to the discussion at the fifteenth session of the Committee for Development Policy, 18-22 March 2013. Available at <https://www.un.org/development/desa/dpad/wp-content/uploads/sites/45/publication/CDP-bp-2013-16.pdf>.
- Lewis, Seth C., and Oscar Westlund (2015). Big data and journalism: epistemology, expertise, economics, and ethics. *Digital Journalism*, vol. 3, No. 3, pp. 447–466.
- Liverpool-Tasie, L.S.O., and Alex Winter-Nelson (2012). Social learning and farm technology in Ethiopia: impacts by technology, network type, and poverty status. *Journal of Development Studies*, vol. 48, No. 10, pp.1505–1521.
- Lowrey, Annie (2013). The inequality of climate change. *New York Times*, 12 November.
- Lugard, Paul, and Lee Roach (2017). The era of “big data” and EU/U.S. divergence for refusals to deal. *Antitrust*, vol. 31, No.2 (spring).
- Lum, Kristian, and William Isaac (2016). To predict and serve? *Significance*, vol. 13, No. 5 (October), pp. 14–19.

M

- Ma, Julian K-C., and others (2005). Plant-derived pharmaceuticals: the road forward. *TRENDS in Plant Science*, vol.10, No.12 (December), pp. 580–585.
- Maddison, Angus (2004). Contours of the world economy and the art of macro-measurement 1500-2001. Ruggles Lecture, presented at the 28th General Conference of the International Association for Research in Income and Wealth, Cork, Ireland. August. Available at <http://citeseerx.ist.psu.edu/viewdoc/download?doi=10.1.1.694.2406&rep=rep1&type=pdf>.
- Mandelli, Stefano, and others (2014). Sustainable energy in Africa: a comprehensive data and policies review. *Renewable and Sustainable Energy Reviews*, vol. 37 (September), pp.656–686.
- Mathews, John A. (2001). National systems of economic learning: the case of technology diffusion management in East Asia. *International Journal of Technology Management*, vol. 22, Nos. 5/6, pp. 455–479.
- Mazzucato, Mariana (2011). *The Entrepreneurial State: Debunking Public vs. Private Sector Myths*. Demos. Available at www.demos.co.uk/files/Entrepreneurial_State_-_web.pdf.
- McAfee, Andrew, and Erik Brynjolfsson (2017). *Machine, Platform, Crowd: Harnessing Our Digital Future*. New York: W.W. Norton.
- McKinsey Global Institute. (2016). *Digital Finance for All: Powering Inclusive Growth in Emerging Economies*. McKinsey & Company. September. Available at www.mckinsey.com/-/media/McKinsey/Global%20Themes/Employment%20and%20Growth/How%20digital%20finance%20could%20boost%20growth%20in%20emerging%20economies/MGI-Digital-Finance-For-All-Executive-summary-September-2016.ashx.
- _____ (2017a). *A Future that Works: Automation, Employment, and Productivity*. McKinsey & Company. January.
- _____ (2017b). *Jobs Lost, Jobs Gained: Workforce Transitions in a Time of Automation*. McKinsey & Company. December.
- McMullen, David P., and others (2014). Demonstration of a semi-autonomous hybrid brain-machine interface using human intracranial EEG, eye tracking, and computer vision to control a robotic upper limb prosthetic. *IEEE Transactions on Neural Systems and Rehabilitation Engineering*, vol. 22, No. 4 (July) pp. 784–796.
- McNeil, Donald G., Jr. (2018). W.H.O. approves a safe, inexpensive typhoid vaccine. *New York Times*, 3 January Global Health. Available at www.nytimes.com/2018/01/03/health/typhoid-vaccine-who.html.
- Melaas, Aaron, and Fang Zhang (2016). National innovation systems in the United States and China: a brief review of the literature. Paper No. 011 (March). Medford, Massachusetts: Center for International Environment and Resource Policy; Energy, Climate and Innovation Program, Fletcher School, Tufts University.

- Metcalf, Stan (1995). The economic foundations of technology policy: equilibrium and evolutionary perspectives (chap. 11). In *Handbook of the Economics of Innovation and Technological Change*, Paul Stoneman, ed. Oxford: Blackwell.
- Meyer, Klaus E. (2004). Perspectives on multinational enterprises in emerging economies. *Journal of International Business Studies*, vol. 35, No.4 (July), pp. 259–276.
- Michaels, Guy, Ferdinand Rauch and Stephen J. Redding (2013). Task specialization in U.S. cities from 1880-2000. *NBER Working Paper*, No. 18715. Cambridge, Massachusetts: National Bureau of Economic Research.
- Milanovic, Branko (2016). *Global Inequality: A New Approach for the Age of Globalization*. Cambridge, Massachusetts: Harvard University Press.
- Miller, Grant, and A. Mushfiq Mobarak (2013). Gender differences in preferences, intra-household externalities, and low demand for improved cookstoves. *NBER Working Paper*, No. 18964. Cambridge, Massachusetts: National Bureau of Economic Research.
- MIT Technology Review Custom and Oracle (2016). The rise of data capital. MIT Technology Review.
- Moretti, Enrico (2010). Local multipliers, *American Economic Review*, vol. 100, No. 2 (May), pp. 373–377.
- Munshi, Kaivan (2004). Social learning in a heterogeneous population: technology diffusion in the Indian Green Revolution. *Journal of Development Economics*, vol. 73, No. 1 (February), pp. 185–213.
- Muro, Mark, and others (2017). *Digitalization and the American Workforce*. November. Available at www.brookings.edu/wp-content/uploads/2017/11/mpp_2017nov15_digitalization_full_report.pdf. Metropolitan Policy Program. Washington, D.C.: Brookings.

N

- Nakamoto, Satoshi (2008). Bitcoin: a peer-to-peer electronic cash system. Available at <https://bitcoin.org/bitcoin.pdf>.
- National Human Genome Research Institute (2017). Cloning. Fact sheet. Available at www.genome.gov/25020028/cloning-fact-sheet.
- National Institute of Standards and Technology (NIST) (2000). The role of standards in today's society and in the future. Testimony of Raymond G. Kammer before the House Committee on Science, Subcommittee on Technology. Available at <https://www.nist.gov/speech-testimony/role-standards-todays-society-and-future>.
- National Institute on Aging, National Institutes of Health and World Health Organization (2011). Global health and aging. NIH publication No. 11-7737. October. Available at www.who.int/ageing/publications/global_health.pdf.
- National Science Board (2016). Science and Engineering Indicators 2016. Alexandria, Virginia. Available at <https://www.nsf.gov/statistics/2016/nsb20161/#/>.

- Nelson, Richard, and Sidney G. Winter (2009). *An Evolutionary Theory of Economic Change*. Cambridge, Massachusetts: Harvard University Press.
- Neslen, Arthur (2017). Electric cars emit 50% less greenhouse gas than diesel, study finds. *Guardian*, 25 October.
- Newman, Lily Hay (2018). The ransomware that hobbled Atlanta will strike again. *Wired*, 30 March. Available at <https://www.wired.com/story/atlanta-ransomware-samsam-will-strike-again/>.
- Nguyen, Khanh Q. (2007). Alternatives to grid extension for rural electrification: decentralized renewable energy technologies in Vietnam. *Energy Policy*, vol. 35, No. 4 (April), pp. 2579-2589.
- Nicas, Jack (2018). How YouTube drives people to the Internet's darkest corners. *Wall Street Journal*, 7 February.
- Noble, Safiya. Umoja (2018). *Algorithms of Oppression: How Search Engines Reinforce Racism*. New York: New York University Press.

O

- O'Neill, Daniel W., and others (2018). A good life for all within planetary boundaries. *Nature Sustainability*, vol. 1 (February), pp. 88–95.
- Odagiri, Hiriyuki, and others (2010). Conclusion. In *Intellectual Property Rights, Development, and Catch-up: An International Comparative Study*, Hiriyuki Odagiri, and others, eds. Oxford: Oxford University Press. Pp. 412–430.
- Organization for Economic Cooperation and Development(OECD) (1997). *National Innovation Systems*. Paris.
- _____ (2010). *Competition, patents and innovation II*. Proceedings of the Roundtable on Competition, Patents and Innovation (II), held by the OECD Competition Committee in June 2009. DAF/COMP (2009)22.1 April.
- _____ (2011). *Demand-side Innovation Policies*. Paris.
- _____ (2012). *OECD Employment Outlook 2012*. Paris.
- _____ (2014). *Challenges of International Co-operation in Competition Law Enforcement*. Paris.
- _____ (2015). *OECD Science, Technology and Industry Scoreboard 2015 Innovation for Growth and Society*. Paris.
- _____ (2016). *OECD Science, Technology and Innovation Outlook 2016*. Paris.
- _____ (2017a). *Algorithms and Collusion: Competition Policy in the Digital Age*. Paris.
- _____ (2017b). Big data: bringing competition policy to the digital era. Executive summary. Key findings from the discussion held by the Competition Committee on 29 November 2016. DAF/COMP/M(2016)2/ANN4/FINAL. Paris. 26 April.
- _____ (2017c). *Fixing Globalisation: Time to Make It Work for All*. Paris.
- _____ (2017d). *OECD Compendium of Productivity Indicators 2017*. Paris.
- _____ (2017e). *OECD Employment Outlook 2017*. Paris.

- _____ (2018a). OECD Tax Talk No. 9. YouTube. 16 March.
- _____ (2018b). *Tax Challenges Arising from Digitalisation: Interim Report 2018 – Inclusive Framework on BEPS*. Paris.
- Oster, Emily, and Rebecca Thornton (2012). Determinants of technology adoption: peer effects in menstrual cup take-up. *Journal of the European Economic Association*, vol. 10, No. 6 (December), pp. 1263–1293.

P

- Peplow, Mark (2016). The plastics revolution: how chemists are pushing polymers to new limits. *Nature News*, vol. 536, No. 7616 (17 August), pp. 266–268.
- Plane, Angelisa, and others (2017). Exploring user perception of discrimination in online targeted advertising. In *Proceedings of the 26th USENIX Security Symposium, Vancouver, BC, Canada, August 16–18, 2017*.
- Police Executive Research Forum (2014). *The Role of Local Law Enforcement Agencies in Preventing and Investigating Cybercrime*. Critical Issues in Policing Series. Police Washington, D.C.
- Pritchett, Lant (1997). Divergence, big time. *Journal of Economic Perspectives*, vol. 11, No. 3 (summer), pp. 3–17.

Q

- Quattrociocchi, Walter, Antonio Scala and Cass R. Sunstein (2016). Echo chambers on Facebook. Available at SSRN: <https://ssrn.com/abstract=2795110>.

R

- Raney, Terri (2006). Economic impact of transgenic crops in developing countries. *Current Opinion in Biotechnology*, vol. 17, No. 2 (April), pp. 174–178.
- Reisman, Dillon, and others (2018). Algorithmic impact assessment: a practical framework for public agency accountability. New York: AI Institute, New York University. *April*.
- Rieke, Aaron, Miranda Bogen and David G. Robinson (2018). Public scrutiny of automated decisions: early lessons and emerging methods. Report of Omidyar Network and Upturn. Available at <https://www.omidyar.com/insights/public-scrutiny-automated-decisions-early-lessons-and-emerging-methods>.
- Ross, Alec (2017). *The Industries of the Future*. New York: Simon & Schuster.
- Rotolo, Daniele, Diana Hicks and Ben R. Martin (2015). What is an emerging technology? *Research Policy*, No. 44, No. 10 (December), pp. 1827–1843. <https://doi.org/10.1016/j.respol.2015.06.006>.
- Royal Society (2012) *Science as an Open Enterprise*. London. June.
- Ruane, John, and Andrea Sonnino (2011). Agricultural biotechnologies in developing countries and their possible contribution to food security. *Journal of Biotechnology*, vol. 156, pp. 356–363.

S

- Sabalza, Maite, Paul Christou and Teresa Capell (2014). Recombinant plant-derived pharmaceutical proteins: current technical and economic bottlenecks, in *Biotechnology Letters*, vol. 36, No. 12 (December), pp. 2367–2379.
- Salicrup, Luis A., and Lenka Fedorková (2006). Challenges and opportunities for enhancing biotechnology and technology transfer in developing countries, in *Biotechnology Advances*, vol. 24, No. 1 (February), pp. 69–79.
- Schön, Wolfgang (2018). Ten questions about why and how to tax the digitalized economy. *IBFD Bulletin of International Taxation*, vol. 72, No. 4/5 (6 March).
- Schwab, Klaus. (2016). *The Fourth Industrial Revolution*. New York: Crown Business.
- _____, with Nicholas Davis (2018). *Shaping the Fourth Industrial Revolution*. Geneva: World Economic Forum.
- Schwebel, Frank J., and Mary E. Larimer (2018). Using text message reminders in health care services: a narrative literature review. *Internet Interventions*. June.
- Sen, Rohit and Subhes C. Bhattacharyya (2014). Off-grid electricity generation with renewable energy technologies in India: an application of HOMER. *Renewable Energy*, vol. 62, No. 1 (February) pp.388–398.
- Shambaugh, Jay, Ryan Nunn and Becca Portman (2017). Eleven facts about innovation and patents. Washington, D.C.: Hamilton Project.
- Shankar, Maya, and Lori Foster (2016). Behavioural insights at the United Nations: achieving Agenda 2030. Available at www.undp.org/content/undp/en/home/librarypage/development-impact/behavioural-insights-at-the-united-nations-achieving-agenda-203.html.
- Shirley, Rebekah, and Daniel Kammen (2013). Renewable energy sector development in the Caribbean: current trends and lessons from history. *Energy Policy*, vol. 57 (June), pp. 244–252.
- Shum, Paul K.C., and others (2016). Globalization and the role of multinational corporations (chap. 4). In *International Economic Development. Leading Issues and Challenges*, Fu Lai Tony Yu, Wai Kee Yuen and Diana S. Kwan, eds. Abingdon, United Kingdom: Routledge.
- Smith, Aaron, and Monica Anderson (2017). Automation in everyday life. Washington, D.C.: Pew Research Center. 4 October. Available at www.pewinternet.org/2017/10/04/automation-in-everyday-life/.
- Speicher, Till, and others (2018). Potential for discrimination in online targeted advertising. In *Proceedings of Machine Learning Research*, vol. 81: Conference on Fairness, Accountability and Transparency, 23–24 February 2018, New York, pp. 5–19.
- Stucke, Maurice E. (forthcoming). Should we be concerned about data-opolies? *Georgetown Law Technology Review*.

_____, and Allen Grunes (2016). *Big Data and Competition Policy*. Oxford: Oxford University Press.

Sundararajan, Arun (2016). *The Sharing Economy. The End of Employment and the Rise of Crowd-based Capitalism*. Cambridge: MIT Press.

Sunstein, Cass R. (2007). The polarization of extremes. *Chronicle of Higher Education: Chronicle Review*. 14 December.

Suri, Tavneet, and William Jack (2016). The long-run poverty and gender impacts of mobile money. *Science*, vol. 354, No. 6317 (9 December), pp. 1288–1292. Available at <http://science.sciencemag.org/content/354/6317/1288.full>.

Susswein, Ruth. (2018). New data protection rights...for Europeans. *Consumer Action Data Protection Issue* (Spring).

T

t Hoen, Ellen F. M., Pascale Boulet and Brook K. Baker (2017). Data exclusivity exceptions and compulsory licensing to promote generic medicines in the European Union: A proposal for greater coherence in European pharmaceutical legislation. *Journal of Pharmaceutical Policy and Practice*, vol. 10, p. 19.

Taylor, Linnet (2016). The ethics of big data as a public good: which public? whose good? *Philosophical Transactions of the Royal Society A*, vol. 374, No. 2083 (28 December).

Tegmark, Max (2017). *Life 3.0: Being Human in the Age of Artificial Intelligence*. New York: Alfred A. Knopf.

Thaler, Richard H. (1999). Mental accounting matters. *Journal of Behavioral Decision Making*, vol. 12, No. 3 (September), pp.183–206.

_____, and Cass R. Sunstein (2008). *Nudge: Improving Decisions about Health, Wealth, and Happiness*. New Haven, Connecticut: Yale University Press.

Thiel, Christian, Jette Krause and Panagiota Dilara (2015). Electric Vehicles in the EU from 2010 to 2014: Is Full Scale Commercialisation Near? *JRC Science and Policy Report*, No. 27417. Luxembourg: Publications Office of the European Union.

Timilsina, Govinda R., and Kalim U. Shah (2016). Filling the gaps: policy supports and interventions for scaling up renewable energy development in Small Island Developing States. *Energy Policy*, vol. 98 C (November), pp. 653–662.

Tonukari, Nyerhovwo J., and Douglason G. Omotor (2010). Biotechnology and food security in developing countries. *Biotechnology and Molecular Biology Reviews*, vol. 5, No. 1 (February), pp. 013–023.

Tribunal Administratif Paris, 12 June 2017, No. 1505178/1-1, summary by Bob Michel, Tax Treaty Case Law IBFD.

U

- UBS Limited (2017). Q-Series: UBS evidence lab electric car teardown – disruption ahead? Global Research. 18 May Available at <https://static1.squarespace.com/static/5959484578d17192407068e4/t/5a42996a53450ae78ed86dbb/1514314095552/Report-UBS-Model-3-Bolt-EVV.pdf>.
- United Kingdom, Department for Environment, Food and Rural Affairs, and Department for Transport (2017a). UK plan for tackling roadside nitrogen dioxide concentrations: an overview. July. Available at https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/633269/air-quality-plan-overview.pdf.
- United Kingdom, Department for Environment, Food and Rural Affairs, and Department for Transport (2017b). UK plan for tackling roadside nitrogen dioxide concentrations: detailed plan. July. Available at https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/633270/air-quality-plan-detail.pdf.
- United Nations (2011). *World Economic and Social Survey 2011: The Great Green Technological Transformation*. E/2011/50/Rev.1-ST/ESA/333. Sales No. E.11.II.C.1.
- _____ (2012). *Road Map on Building a Green Economy for Sustainable Development in Carriacou and Petite Martinique, Grenada*. Product of an international study led by the Division for Sustainable Development of the Department of Economic and Social Affairs of the United Nations Secretariat, in cooperation with the Ministry of Carriacou and Petite Martinique Affairs and the Ministry of Environment, Foreign Trade and Export Development of Grenada.
- _____ (2013). *Report on the World Social Situation 2013: Inequality Matters*. ST/ESA/345. Sales No. E.13.IV.2.
- _____ (2014). *United Nations E-Government Survey 2014: E-Government for the Future We Want*. Sales No. 14.II.H.1.
- _____ (2016a). *Report on the World Social Situation 2016: Leaving No One Behind – The Imperative of Inclusive Development*. ST/ESA/362. Sales No. E.16.IV.1.
- _____ (2016b). *World Economic and Social Survey 2016: Climate Change Resilience – An Opportunity for Reducing Inequalities*. E/2016/50/Rev.1-ST/ESA/363. Sales No. E.16.II.C.1.
- _____ (2017a). Remarks of the Secretary-General, António Guterres, delivered on 6 November at the 2017 Web Summit, held in Lisbon from 6 to 9 November 2017. Available at <https://www.un.org/sg/en/content/sg/speeches/2017-11-06/secretary-generals-remarks-web-summit>.
- _____ (2017b). *Financing for Development: Progress and Prospects*. Report of the Inter-agency Task Force on Financing for Development 2017. Sales No. E.17.I.5.

- _____ (2017c). *The Sustainable Development Goals Report 2017*. Sales No. E.17.I.7.
- _____ (2018a). *Financing for Development: Progress and Prospects 2018*. Report of the Inter-agency Task Force on Financing for Development. Sales No. E.18.I.5.
- _____ (2018b). *World Public Sector Report 2018: Working Together—Integration, Institutions and the Sustainable Development Goals*. Sales No. E.18.II.H.1.
- _____, Department of Economic and Social Affairs, Economic Analysis and Policy Division (2017). World Economic Situation and Prospects monthly briefing. 102. 8 May. Available at www.un.org/development/desa/dpad/publication/world-economic-situation-and-prospects-may-2017-briefing-no-102/.
- United Nations, Department of Economic and Social Affairs, Population Division (2017). *World Population Prospects: The 2017 Revision - Key Findings and Advance Tables*." ESA/P/WP/248. Available at https://esa.un.org/unpd/wpp/Publications/Files/WPP2017_KeyFindings.pdf.
- United Nations, Economic and Social Council (2017). Report of the Secretary-General on progress towards the Sustainable Development Goals. E/2017/66. Available at <https://unstats.un.org/sdgs/files/report/2017/secretary-general-sdg-report-2017--EN.pdf>.
- _____ (2018). Report of the Secretary-General on harnessing the Sustainable Development Goals. 21 May. E/2018/66.
- United Nations, Economic Commission for Europe (ECE) (2009). *Policy Options and Instruments for Financing Innovation: A Practical Guide to Early-Stage Financing*. Sales No. 09.II.E.3.
- United Nations, United Nations System Chief Executives Board for Coordination secretariat (2017). *Compendium of Responses to the CEB Survey on Frontier Issues*. 27 October. Available https://www.unsceb.org/CEBPublicFiles/CEB_Survey_Compendium.pdf.
- United Nations Conference on Trade and Development (UNCTAD) (2017). *Trade and Development Report 2017: Beyond Austerity – Towards a Global New Deal*. Sales No. E.17.II.D.5.
- _____ (2018). *World Investment Report, 2018: Investment and New Industrial Policies*. Sales No: E.18.II.D.4.
- _____, Trade and Development Board (2017). Note by the UNCTAD secretariat on enhancing international cooperation in the investigation of cross-border competition cases: tools and procedures. 26 April. TD/B/C.I/CLP/44.
- United Nations Educational, Scientific and Cultural Organization (UNESCO) (2015). *UNESCO Science Report: Towards 2030*. Paris.
- United Nations Environment Programme, International Resource Panel (2017). *Assessing Global Resource Use: A Systems Approach to Resource Efficiency and Pollution Reduction*. Nairobi: United Nations Environment Programme.
- United Nations Framework Convention on Climate Change (UNFCCC) (2015). *Report of the Conference of the Parties on its twenty-first session, held in Paris from 30 November to 13 December 2015, Part two: Action taken by the Conference of the Parties at its twenty-first session (FCCC/CP/2015/10/Add.1, decision 1/CP.21, annex)*

- United Nations University/Step Initiative 2014. (2014). *Solving the E-Waste Problem (Step) White Paper: One Global Definition of E-waste*. Available at http://www.step-initiative.org/files/step/_documents/StEP_WP_One%20Global%20Definition%20of%20E-waste_20140603_amended.pdf.
- United States Standards Strategy Committee (2016). *United States Standards Strategy*. Washington, D.C.: American National Standards Institute.
- University of Minnesota, Center for Sustainable Polymers (2018). Sustainable polymers 101. Available at <https://csp.umn.edu/sustainable-polymers-101>.
- Urmee, Tania, David Harries and August Schlapfer (2009). Issues related to rural electrification using renewable energy in developing countries of Asia and Pacific. *Renewable Energy*, vol. 34, No. 2 (February), pp. 354–357.
- United States Environmental Protection Agency (2017) Greenhouse gas emissions: understanding global warming potentials. 14 February. Available at <https://www.epa.gov/ghgemissions/understanding-global-warming-potentials>.

V

- Varblane, Urmas, David Dyker and Dorel Tamm (2007). How to improve the national innovation systems of catching-up economies? *Frames*, vol. 11, No. 2, pp. 106–123.
- Vickers, Chris, and Nicolas L. Ziebarth (2017). Lessons for today from past periods of rapid technological change. Background paper prepared for *World Economic and Social Survey 2018*.
- Vidican Auktor, Georgeta (2017). Renewable energy as a trigger for industrial development in Morocco. In *Green Industrial Policy: Concepts, Policies, Country Experiences*, Tilman Altenburg and Claudia Assmann, eds. Geneva: UN Environment; and Bonn: German Development Institute.
- Viitamo, Esa (2003). Knowledge-intensive services and competitiveness of the forest cluster: case of Finland. ETLA Discussion Paper, No. 845. Helsinki: Research Institute of the Finnish Economy.
- Vosoughi, Soroush, Deb Roy and Sinan Aral (2018). The spread of true and false news online. *Science*, vol. 359, No. 6380 (9 March), pp. 1146–1151.

W

- Wallace, Nick, and Daniel Castro (2018). The impact of the EU's new data protection regulation on AI. Center for Data Innovation. 27 March.
- Weinberger (2018). Don't make AI artificially stupid in the name of transparency. *Wired*. Opinion. Available at <https://www.wired.com/story/dont-make-ai-artificially-stupid-in-the-name-of-transparency/>.
- Wiesser, Daniel (2004). On the economics of electricity consumption in small island developing states: a role for renewable energy technologies? *Energy Policy*, vol. 32, No. 1 (January), pp.127–140.
- Wolf, Steven, David Just and David Zilberman (2001). Between data and decisions: the organization of agricultural economic information systems. *Research Policy*, vol. 30, No, 1 (January), pp. 121–141.

- Wong, Poh Kam, and Annette Singh. (2008). From technology adopter to innovator: Singapore. In *Small Country Innovation Systems: Globalization, Change and Policy in Asia and Europe*, Charles Edquist and Leif Hommen, eds. Cheltenham, United Kingdom: Edward Elgar. Pp. 71–112.
- World Bank (2015). *World Development Report 2015: Mind, Society, and Behavior*. Washington, D.C.
- _____ (2016). *World Development Report 2016: Digital Dividends*. Washington, D.C.
- World Economic Forum (2017). *The Global Risks Report 2017*, 12th ed. Geneva. Available at www3.weforum.org/docs/GRR17_Report_web.pdf.
- _____ (2018). *The Global Risks Report 2018*, 13th ed. Geneva. Available at www.weforum.org/reports/the-global-risks-report-2018.
- World Energy Council (2016). *World Energy Resources 2016*. London. Available at www.worldenergy.org/publications/2016/world-energy-resources-2016/.
- World Health Organization (WHO) (2009). *Global Health Risks: Mortality and Burden of Disease Attributable to Selected Major Risks*. Geneva.
- _____ (2017). *World Health Statistics 2017: Monitoring Health for the SDGs*. Geneva. Available at www.who.int/gho/publications/world_health_statistics/2017/en/.
- _____ (2018). Essential medicines and health products: typhoid vaccine prequalified. Available at www.who.int/medicines/news/2017/WHOprequalifies-breakthrough-typhoid-vaccine/en/.
- World Wide Web Foundation (2017). Algorithmic accountability: Applying the concept to different country contexts. Washington, D.C. July.
- World Trade Organization (WTO) (2015). TRIPS: WTO members agree to extend drug patent exemption for poorest members. 6 November. Available at https://www.wto.org/english/news_e/news15_e/trip_06nov15_e.htm.
- _____ (2017). *World Trade Statistical Review 2017*. Geneva.

Z

- Zahra, Shaker A., and Gerard George (2002). Absorptive capacity: a review, reconceptualization, and extension. *Academy of Management Review*, vol. 27, No. 2 (April), pp. 185–203.
- Zettler, Erik R., Tracy J. Mincer and Linda A. Amaral-Zettler (2013). Life in the “plastisphere”: microbial communities on plastic marine debris. *Environmental Science and Technology*, vol. 47, No. 13, pp. 7137–7146.
- Zgrzebnicki, Pawel (2017). Selected ethical issues in artificial intelligence, autonomous system development and large data set processing. *Studia Humana*, vol. 63, No. 3, pp. 24–33.

Databases

Conference Board Total Economy Database

www.conference-board.org/data/economydatabase/

FAOSTAT [Food and Agriculture Organization of the United Nations (FAO)] database

www.fao.org/faostat/en/

ILOSTAT: International Labour Organization labour statistics database

www.ilo.org/ilostat

National Renewable Energy Laboratory website (United States); “Photovoltaic Research” page

www.nrel.gov/pv

OECD.Stat: Main Science and Technology Indicators

https://stats.oecd.org/Index.aspx?DataSetCode=MSTI_PUB

Partnership on AI website

www.partnershiponai.org/

UIS.Stat: United Nations Educational, Scientific and Cultural Organization (UNESCO) Institute for Statistics (UIS) database

<http://data.uis.unesco.org/>

World Development Indicators: primary World Bank collection of development indicators

<https://data.worldbank.org/products/wdi>