ECONOMIC AND SUSTAINABLE DEVELOPMENT

The Digital Transition in the Mediterranean

Trends and Prospects

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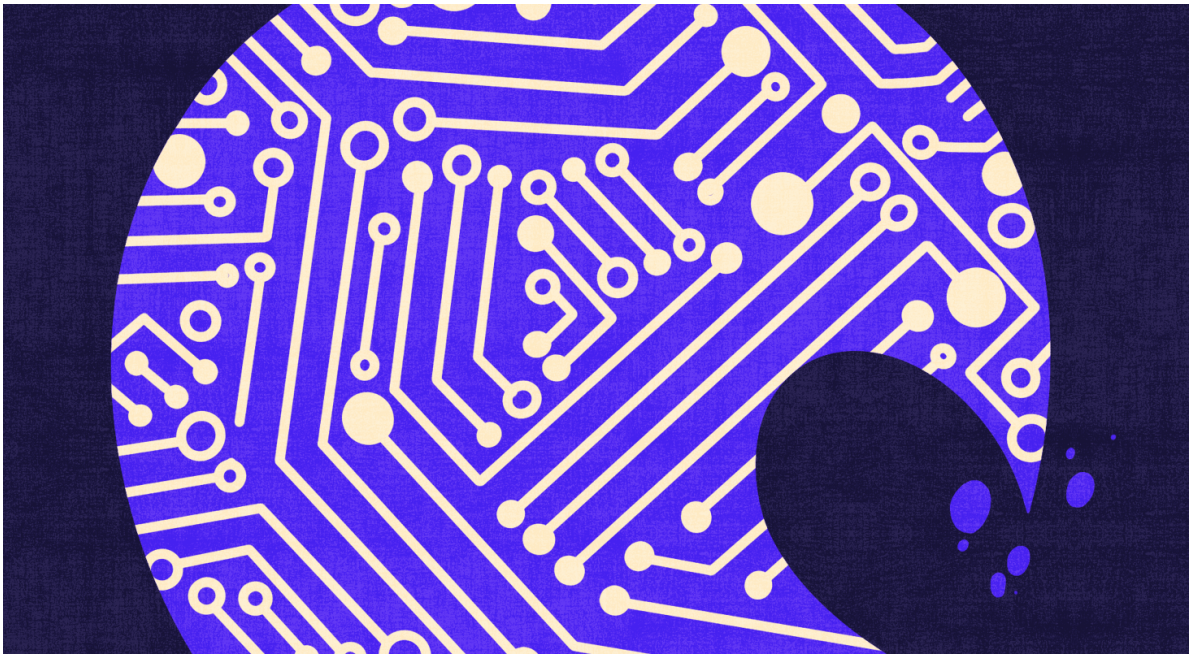

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Globalisation, automation and technological progress have prepared the ground to the emergence of a full-fledged global digital economy. The latter could accelerate and transform these trends and accentuate their impacts noticed prior to COVID-19 pandemic. In this paper we explore the prior and existing trends leading to the digital revolution [1], we dive into the main pillars of the transformative digital economy and we discuss their potential impacts and tensions in the developed and developing economies particularly those around the Mediterranean region. This region has been a target to integration, convergence, divergence, political and economic transitions over the last decades.

Globalisation trends

Globalisation, manifested in technology, flows of capital, people, goods and services, binds economies together. Increasingly open and unrestricted trade in goods and services improves productivity and contributes to economic growth. The availability of a greater

variety of cheaper products, the creation of new and different opportunities for work, and the possibility for countries to specialise in the production of what they are good at, has lifted millions out of poverty and raised living standards for billions. But there are two sides to every coin. Trade also sets off the restructuring of economic activity. In the process, workers gain jobs whilst others lose them; workers see their wages rise, whilst others see them stagnate or decline. Recent decades have also seen a reorganisation of trade into increasingly complex value chains powered by digital developments.

In recent years, inequality between nations has declined, due to economic growth in emerging economies, but inequality within nations has increased. This is true for many developing economies, as well as most members of the Organisation of Economic Cooperation and Development [2]. The gap between the rich and poor is at its highest level in decades in developed economies. The picture is more mixed in emerging and developing countries, but access to quality education, healthcare, finance, housing and other basics remains deeply unequal in many nations.

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One of the major developments in the modern era of globalisation has been the growing trade with emerging economies in Asia, especially China. Another important question is how international trade affects overall manufacturing employment in an economy. For instance, globalisation, and particularly rising trade with China, has been blamed for a substantial part of the decline in manufacturing jobs observed in the United States. However, the conclusion that trade contributes to the overall decline of manufacturing employment may not apply equally to all developed, industrialised countries. They all tend to observe a secular decline in manufacturing jobs. Technology certainly adds to this trend, as production processes become increasingly automated and digitalised everywhere [3].

To make globalisation work for all in the developed economies, and to avoid individual losses, it is essential to facilitate a smooth adjustment in the labour market, and to support workers finding their way back into better jobs quicker, in case of a trade-induced job loss.

Focusing now on developing nations, for many of them, trade provided a vehicle for integration, economic growth and development.

By the middle of the 1990s, the economies in developing countries like China, India and Brazil, were rapidly developing their export sectors. These nations did not just offer cheaper labour, they had more of it.

But leveraging a greater supply of low-wage, low-skilled labour as a comparative advantage comes with several problems. First, it can create incentives to maintain low standards.

Suppliers depress wage costs, sometimes for higher margins, other times because of pressure from buyers and brands – intra-industry trade – to keep costs and/or the time it takes to produce a good, low [4]. This also leads to a disempowerment of social institutions, such as unions, that fight for higher standards and fair compensation.

Second, using trade as a spring board to spark development, is also contingent on a country's capacity and willingness to

1. Move from low value add production to higher levels of production.
2. Diversify its economy to provide greater opportunities for employment at different skill levels.
3. Redistribute the gains from trade through domestic policies that help people adjust to the churn.

In this context, other less developed economies are struggling to become global industrial players in a landscape that has grown ever more competitive and crowded. Global Value Chains have also concentrated in Asia and Eastern Europe and not as much in Latin America, the Middle East and Africa. Many countries in Africa struggle with poor infrastructure, low regional integration and weak political institutions to fully participate in value chains.

> While technology at one time enabled developing nations to participate in the global economy, it now threatens to disrupt their economies

Nowadays, an increasing number of developing countries recognise that "race to the bottom economics" is detrimental to their own development trajectories. Trade agreements, alongside capacity building and technical assistance, can help equip these nations in building the institutions that ensure that regular workers benefit from an expanding economic pie and that trade is pursued in the service of development [5].

Finally, while technology at one time enabled developing nations to participate in the global economy, it now threatens to disrupt their economies. But this is another story – the impact of automation trends – that we will discuss in the next section.

Automation trends: the on-going digital revolution

As stated by Klaus Schwab, who first described the impact of digital and other convergent technologies as the "Fourth Industrial Revolution" [6] we stand on the brink of a technological revolution that will fundamentally alter the way we live, work and relate to one another. In its scale, scope and complexity, the transformation will be unlike anything humankind has experienced before.

Like the revolutions that preceded it, the Fourth Industrial Revolution has the potential to raise global income levels and improve the quality of life for populations around the world. At the same time, as the economists Erik Brynjolfsson and Andrew McAfee have pointed out, the revolution could yield greater inequality, particularly in its potential to disrupt labour markets. As automation replaces labour across the entire economy, the net displacement of workers by machines might exacerbate the gap between returns to capital and returns to labour. One thing seems certain – that in the future, talent, more than capital, will represent the critical factor of production. This will give rise to a job market increasingly segregated into “low-skill/low-pay” and “high-skill/high-pay” segments. The result is a job market with a strong demand at the high and low ends, but a hollowing out of the middle, which will lead to an increase in social tensions and more costs for transition from a traditional labour market, to a more digital way of working.

This helps explain why so many workers are disillusioned and fearful that their own real incomes and those of their children will continue to stagnate. It also helps explain why middle classes around the world are increasingly experiencing a pervasive sense of dissatisfaction and unfairness. The COVID-19 pandemic accelerated the trend and social tension with many who are not prepared are risking economic and social exclusion.

Overall, the inexorable shift to innovation based on combinations of technologies (the Fourth Industrial Revolution) is forcing companies to re-examine the way they do business.

> The Fourth Industrial Revolution has the potential to raise global income levels and improve the quality of life for populations, but it could also yield greater inequality

A key trend in this respect is the development of low cost, technology-enabled platforms that combine both demand and supply to disrupt existing industry structures, such as those we see within the “sharing” or “on demand” economy. These technology platforms, rendered easy-to-use by the smartphone, convene people, assets and data —thus creating entirely new ways of consuming goods and services in the process. In addition, they lower the barriers for businesses and individuals to create wealth, altering the personal and professional environments of workers. These new platform businesses are rapidly multiplying into many new services. These developments also raise security and cyber-crime challenges.

Focusing now again on developing nations, the above-mentioned trends threaten to disrupt their economies in at least three ways. First, the threat of automation and robotics looms over developing nations as it does over industrial ones; though the impact and pace of change is likely to vary across countries based on their level of development. Automation and robotics threaten to prompt a decline in manufacturing’s share of employment. Second, there may also be a shortening of supply chains, where cheaper technology makes it possible to produce closer to consumers and innovation centres, fuelling a re-shoring

phenomenon that is aided by protectionist sentiments. And third, though both these threats may still be some time away for developing nations, greater technology threatens to make employment more skill biased, changing the task requirements, especially in mid-level occupations [7]. These trends are exacerbated when automation is accelerated to respond to external shocks such as COVID-19, when social distancing and less human interaction become the norm.

Prospects for a digital economy in the Mediterranean

The speed of current breakthroughs has no historical precedent. When compared with previous industrial revolutions, the Fourth is evolving at an exponential rather than a linear pace. Moreover, it is disrupting almost every industry in every country. And the breadth and depth of these changes herald the transformation of entire systems of production, management, finance and governance. The Mediterranean region composed of developed and developing countries is at the heart of this transformation similar to other parts of the world. The level of preparedness to this impressive transformation depends on the infrastructure capacity, telecom and technological progress achieved.

The possibilities of billions of people connected by mobile devices, with unprecedented processing power, storage capacity and access to knowledge, are unlimited. And these possibilities will be multiplied by emerging technological breakthroughs in fields such as artificial intelligence, big data analytics, robotics, the Internet of Things, autonomous vehicles, 3-D printing, nanotechnology, biotechnology, materials science, energy storage, to name some.

Already, artificial intelligence is all around us, from self-driving cars and drones to virtual assistants and software that translate or invest. Impressive progress has been made in AI in recent years, driven by exponential increases in computing power (super-computing) and by the availability of vast amounts of data – from software used to discover new drugs to the algorithms used to predict our cultural interests. A most recent example is COVID-19 application trackers that raised fundamental controversies in terms of data privacy.

Recently, the great transformation ahead of us has been analysed from different angles in three ponderous foresight studies that we are going to present in the next three sub-sections.

Globotics transformation

The economist, Richard Baldwin, warn us in his last book about how speedy the Globotics Transformation will come. “Globots” and “Globotics” are neologisms merging a new form of globalisation exploiting remote intelligence (RI) with robotics exploiting the advancements in artificial intelligence (AI).

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> we can predict that the jobs that survive competition from AI and the new jobs that will be created are those that highlight humanity’s great advantages

Globotics will manifest with an exponential growth, not linear, and penetration of globots will happen –is the Baldwin assumption– like the penetration of i-phones and smartphones we are now seeing in our daily life. Exponential growth –and digital technologies are indeed following this path– advances by small increments, since it starts from zero, doubling the amount at each step (year). For years, the progress is almost imperceptible, but then the increments become immense. This imperceptible-for-decades-then-explosive feature is why many are either unaware of how fast the changes are coming or living in denial.

When the explosive growth of digital progress comes in, the perception is that a sudden change is happening. This is when digitech is disruptive. People knew it was coming – they just didn’t expect it to come so fast. They just can’t comprehend why things are changing so fast now, when they weren’t changing that fast in the past. The progress during the explosive growth phase just doesn’t seem feasible or reasonable given past experience.

Now, the most important implications are those for the future of work and jobs.

Unlike the old globalisation, where foreign competition showed up in the form of foreign goods, this “globotics” wave of globalisation will show up in the form of telemigrants working in our offices. We will see their faces and know their stories. This will be humanising but won’t change the basic fact that they will accept lower pay, at least in part because they won’t pay the same taxes or face the same costs of housing, medical care, schooling, or transportation in their countries. Likely, they won’t be subject to the same labour laws or workplace regulations as well.

The robot part of globots will be unfair for us in similar ways. White-collar robots are paid zero wages and they are incapable of accepting perks. You cannot force “cogitating computers” to take holidays, lunch breaks, or sick days. They aren’t subject to workplace regulations. They can work 24/7 if need be and be cloned without limits. The industry calls them “digital workers”, but in fact they are nothing more than computer software – algorithms at play.

By studying the things that AI-trained robots can already do well, we can predict that the jobs that survive competition from AI and the new jobs that will be created are those that highlight humanity’s great advantages. Machines have not been very successful at acquiring social intelligence, emotional intelligence, creativity, innovativeness, or the ability to deal with unknown situations. Experts estimate that it will take something like fifty years for AI to attain top-level human performance in social skills that are useful in the workplace, like social and emotional reasoning, coordination with many people, acting in emotionally appropriate ways, and social and emotional sensing. This suggests that most human skills will be sheltered from AI competition for many years. The implication is as

simple as it is profound. Humanity will be more – not less – important in most jobs of the future.

> To prepare for a better future of work and jobs, we should invest in building soft skills, like being able to work in groups and being creative, socially aware, emphatic and ethical: these will be the workplace skills in demand because globots aren't good at these things

To prepare for a better future of work and jobs, we should invest in building soft skills, like being able to work in groups and being creative, socially aware, emphatic and ethical. These will be the workplace skills in demand because globots aren't good at these things. Of course, it can't be 100 percent soft skills. We will have to be more technically fluent. One point that it is often lacking in the public debate is as simple as it is obvious. Most people who win from the Globotics Transformation will be using globots, not designing them. A few AI and telecommunication experts will get fabulously wealthy, but that is an irrelevance in the world of work. Putting it starkly, if you don't want to be replaced by globots, you will probably have to learn how to use them as tools in your job.

The final conclusions of the Baldwin analysis are particularly straightforward: "Globotics" is coming faster than most think, in ways few expect. It will create a better world of work and living – but only if we manage the transition. Mismatched speed is the key problem. We can control the speed of the transformation. It is our choice.

Pan-industrial revolution

Another major techno economic pathway – the so called "pan-industrial revolution" – is described by Richard D'Aveni [8]. According to this foresight study, there is a remarkable, still-evolving array of new technologies called "additive manufacturing" [9] that will have a strong impact on the world economy.

In the years ahead, additive manufacturing (AM) is likely to transform the way practically everything is made. The changes will affect the nature, size, organisation and location of manufacturing facilities; the scale and structure of employment in the manufacturing sector; the ways R&D, innovation and product development are conducted; the internal and external structures of companies and the interrelationships amongst them; the nature of competition; the structure of entire industries; and even the global balance of power among countries in the developed and developing worlds.

These changes will take time, of course. But all of them will be the ultimate outcome of the playing-out of new emerging trends, launched with the invention, spread and development of additive manufacturing. Today, additive manufacturing technologies are being combined

with more familiar traditional manufacturing techniques. In many factories around the world, 3D printers are being installed in spare corners, where they are used to turn out parts or tools on demand, whilst the items so produced help to feed the conventional manufacturing process, usually with marginal efficiency gains. These systems, in which AM tools serve merely as accessories to traditional production methods, are just the first stage in the emerging manufacturing revolution. In the next stage – already beginning – the new AM techniques will increasingly be combined with other high-tech tools that are themselves undergoing rapid development and advancement – robotics, lasers, cloud computing, artificial intelligence, machine learning and the Internet of Things (IoT). All these tools are made possible by digitalisation, which makes the entire system more flexible, efficient and versatile, since it is controlled by software systems that can quickly and easily be revised, updated and enhanced, as circumstances require.

> There is a remarkable, still-evolving array of new technologies called “additive manufacturing” that will have a strong impact on the world economy. Additive manufacturing is likely to transform the way practically everything is made

The powers of 3D printers and other additive manufacturing tools will enable manufacturers for the first time to benefit from economies of scope. These are economic benefits that arise from the ability to make almost everything, anywhere, rather than being forced to specialise in one or few products. At the same time, the new AM technologies are rapidly achieving the quality, speed and efficiency they need to produce mass quantities of identical goods in certain vanguard industries, beating old-style plants based on the economies of scale from which giant companies have long benefitted. Conventional wisdom says there are no economies of scale with AM. But today, AM is achieving economies of scale in a variety of ways – and doing so without sacrificing economies of scope. As a result, we are now seeing the increasing application of AM to the making of standardised products in mass quantities.

The natural result of the new capacity of combining the economics of scope with the economics of scale will be – D’Aveni says – the emergence of pan-industrials – i.e. manufacturing corporations that are gigantic in size, highly diverse in their product offerings and enormously profitable.

Platform businesses have revolutionised one consumer market after another. However, until recently, they haven’t made much of a dent in the industrial arena. But now, the digitisation of manufacturing is a game changer in this respect. In a world of AM and other digital technologies for automating production, industrial platforms can have incredible power to increase the speed, accuracy, efficiency and flexibility of manufacturing. These industrial platforms will bridge the B2B and B2C arenas, will engage participants in more complicated user interactions – not only simple matching functions, as those used in the consumers platforms, but a wider range of activities aimed at ecosystem optimisation.

Finally, the winner-takes-all dynamics, commonly found in consumer platforms, will probably not be prevalent amongst industrial platforms. Instead, within any given industrial marketplace, it is likely that some industrial platforms will survive and compete with one another, creating an oligopolistic landscape. This is primarily because the importance of confidentiality as a competitive advantage in the industrial world will create natural, inherent limits in the amount of sharing that companies will permit, especially when they are rivals for the same customers. Another reason is the relative complexity of the services and benefits that an industrial platform will offer, compared to the simple matching functions of a consumer platform.

Blockchain revolution

The first four decades of Internet brought us e-mail, the World Wide Web, dot-coms, social media, the mobile Web, big data, cloud computing and the early days of the Internet of Things. It has been great for reducing the cost and enhancing our capacity of searching, collaborating and exchanging information. It has lowered the barriers to entry for new media and entertainment, new forms of retailing and organising work and unprecedented digital ventures. Through sensor technology, it has infused intelligence into our wallets, our clothing, our cars, our buildings, our cities and even our biology. Overall, the Internet has enabled many positive changes – for those with access to it – but it has serious limitations for business and economic activity: online, we still can't reliably establish one another's identities, or trust one another to transact and exchange money without validation from a third party, like a bank or a government.

This is what the blockchain revolution [10] adds to the picture: it enables trusted transactions directly between two or more parties, authenticated by mass collaboration and powered by collective self-interests, rather than by large corporations (the banks) [11]. Whilst the technology is complicated and the world blockchain isn't exactly intuitive, the main idea is simple. Blockchain enables us to send money directly and safely from me to you, without going through a bank, a credit card company, or PayPal. Rather than the Internet of Information, it is the Internet of Value or Money.

> Blockchain enables trusted transactions directly between two or more parties, authenticated by mass collaboration and powered by collective self-interests

It is also a platform for everyone to know what it is true – at least with regard to structured recorded information. It can be used not only for exchanging money, but for authenticating any kind of transaction, for instance the issuing of education and training certificates, transactions of property rights on any kind of assets, contractual obligations (smart contracts), and to access to basic certified health services etc. And at its most basic, it is an open source code: anyone can download it for free, run it and use it to develop new tools for

managing transactions online. As such, it holds the potential for unleashing countless new applications and, as yet, unrealised capabilities that have the potential to transform many things.

Conclusion

In sum, the acceleration of the digital developments, powering globalisation and automation trends will lead to different forms of production and consumption systems globally and in the Euro-Mediterranean in particular. The COVID-19 pandemic is accelerating further this transition and will expose the countries to adapt to this new reality.

According to the World Business Council for Sustainable Development vision [12], COVID-19 has accelerated – and will continue to accelerate – the deployment of a wide range of existing technologies. E-commerce, remote working, online learning and telemedicine have all received a boost that will only partly dissipate after the crisis passes. The race to develop a vaccine is turbo-charging technological innovation in the pharmaceuticals sector. Automation of production and distribution processes is accelerating as a way of restricting the spread of the virus in the short term – and to make supply chains more resilient to the kind of shock a pandemic creates in the longer term (though, ironically, this may increase vulnerability to different kinds of risks, such as cyberattacks). Meanwhile, key technologies in different areas – from biotech to renewable energy – are developing along exponential pathways that could lead to economic tipping points during the 2020s. The spread of automation in every industry – from manufacturing to finance – will accelerate, driven by the growing maturity of a wide range of technologies such as artificial intelligence, robotics and 3D printing. All of these have the potential to enable smarter and more sustainable use of resources – and to fuel future growth.

A vital question remains how equitably the gains of technological progress will be shared. Many digital technologies create winner-takes-all dynamics, which, in the absence of countervailing interventions from government, will tend to increase both market concentration and inequality. Automation will also cause disruption for many workers and put further strain on the link between work and economic security in many places. One legacy of COVID-19 may be a strengthening of social safety nets, which would help mitigate the impact of automation on workers. But if, conversely, COVID-19 ushers in a new era of austerity, there is a high risk that automation will lead to rising inequality within countries, fuelling anger and disillusionment, and fanning the flames of populism. Regular re-skilling will become a requirement for most. Supply chains, too, will be reshaped – and, in many cases, shortened – as access to leading-edge technologies becomes more critical for both manufacturing and services than access to a cheap, skilled workforce.

REFERENCES

1 — This contribution is extracted from Ayadi, R. & Sessa, C. (2020) Blue Transition Policy Roadmap: Towards Transparent, Responsible, Inclusive and Sustainable (TRIS) Development in the Mediterranean. Available online.
2 — OECD. (2017). *Making Trade Work for All*, Paris.
3 — ILO. (2017). *Employment Policy Brief: New Automation Technologies: Job Creation and Destruction Dynamics*.
4 — Worker Rights Consortium, JustJobs Network and Centre for American Progress. (2013). *Global Wage Trends for Apparel Workers, 2001–2011*.
5 — Dewan, S. (2016). *Statement to Congress: The Labour Provisions in the Trans-Pacific Partnership*.
6 — The First Industrial Revolution used water and steam power to mechanise production. The Second used electric power to create mass production. The Third used electronics and information technology to automate production. Now, a Fourth Industrial Revolution characterised by a fusion of technologies that is blurring the lines between the physical, digital and biological spheres.
7 — When shoes, say, can be cheaply produced with 3D printing, major brands will be less interested in offshoring to developing countries where labour is cheap. Re-shoring will be more common. In other words, many if not most of the newest technologies, imply that the comparative advantage of low-income countries in standard manufacturing will tend to dissipate. Skill-biased technological change requires developing countries to double up their investment in human capital, just to stay where they are. (Rodrik D., 2018)
8 — D'Aveni, R., (2018), *The Pan-Industrial Revolution. How New Manufacturing Titans will Transform the World*. Houghton Mifflin Harcourt, New York.
9 — "3D printing" has been the first form of additive manufacturing (AM), invented back in 1983. The term refers to any kind of production in which materials are built up to create a product rather than cut, ground, drilled, or otherwise reduced into shape – techniques known as subtractive manufacturing. Nowadays, some industries have already shifted to AM, especially where nano-precision matters (e.g. in the hip and knee implant industries in the health sector). Prototype buses and houses – big things – are being developed as well. And AM is already extensively used to manufacture parts of engines in the aviation and car industries. Other remarkable AM innovations include nano-printing, used to print objects at molecule scale, particularly in medicine and bioprinting, a form of AM that uses so-called bio-inks to create structures that mimic the functioning of naturally created living tissues.
10 — The blockchain revolution prospects are discussed extensively in D. & A. Tapscott (2018).

11 — The first – and now more famous – instance of blockchain application is the protocol for a peer-to-peer electronic cash system, using a cryptocurrency called Bitcoin. This first protocol has been followed by a growing number of global distributed ledgers called blockchains – of which the Bitcoin blockchain is the largest. Cryptocurrencies (digital currencies) are different from traditional flat currencies because they are not created or controlled by countries, but based on an established set of rules – in the form of distributed computations – that ensure the integrity of the data exchanged amongst billions of devices, without going through a trusted third party.

12 — World Business Council for Sustainable Development (2020), *The consequences of COVID-19 for the decade ahead*, Vision 2050 issue brief, WBCSD, May 2020, Available online.

BIBLIOGRAPHY

- Acemoglu, D., Autor, D., Dorn, D., Hanson, G. H. and Price, B. (2016). Import Competition and the Great U.S. Employment Sag of the 2000s, Journal of Labour Economics 34(1): 141–198.
- Autor, D., Dorn, D. and Hanson, G. (2013). *The China Syndrome: Local Labour Market Effects of Import Competition in the United States*, American Economic Review 103: 2121–68.
- Autor, D. H., Dorn, D., Hanson, G. H., & Song, J. (2014). *Trade adjustment: Worker-level evidence. The Quarterly Journal of Economics*, *129*(4), 1799-1860.
- Baldwin, R., (2019) *The Globotics Upheaval. Globalisation, Robotics, and the Future of Work*. Oxford University Press.
- Dewan, S. and Suedekum, J., (2017) *The Global Deal and Trade: Harnessing the Benefits for Greater Development, Equality and Growth*. Discussion Paper. JustJobs Network, DICE and CEPR.
- Durand, C. and Winkler D. (2018), *Intellectual Monopoly in Global Value Chains*, Pre-print available on Research Gate.
- ILO. (2016). *Decent Work in Global Supply Chains*. Report prepared for 105th session, International Labour Conference, 8 April 2016.
- IMF. (2017). *World Economic Outlook: Understanding the Downward Trend in Labour Income Shares*, see: chapter 3.
- Krugman, P. (2016). *Trade and Jobs – A Note*. New York Times vol 3. July 2016

- Pierce, J. R. and Schott, P. K. (2016). *The Surprisingly Swift Decline of US Manufacturing Employment*, American Economic Review 106(7): 1632–1662.

- Rodrik, D., (2018). *New Technologies, Global Value Chains, and Developing Economies*. NBER Working Paper Series, Working Paper 25164, Cambridge, MA, U.S.

- Rodrik, D. (2011). *The Globalisation Paradox: Why Global Markets, States, and Democracy can't co-exist*. Oxford University Press.

- Schwab, K., (2016). *The Fourth Industrial Revolution: what it means, how to respond*. World Economic Forum.

- Tapscott, D. and Tapscott, A., (2018) *Blockchain Revolution. How the Technology Behind BITCOIN and Other CRYPTOCURRENCIES is Changing the World*. Penguin Books, UK.

- UNCTAD. (2013). *World Investment Report 2013: Global Value Chains: Investment and Trade for Development.* United Nations Publication, Geneva.

- World Economic Forum (2017), *Realising the Potential of Blockchain. A Multi-stakeholder Approach to the Stewardship of Blockchain and Cryptocurrencies*. White Paper, June 2017.

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