THE FUTURE OF WORK
AND EDUCATION FOR THE DIGITAL AGE

Industrialization and Growth in Digital Age: Disruptions and Opportunities for Employment Led Growth in Asia and Africa

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Abstract

Digital economy will affect the patterns and geographical location of industries, employment and economic growth. Structural transformation and employment generation policies in developing Asia and Africa must understand, prepare and respond to these changes. Investments in industrialization and manufacturing will continue to drive an employment led growth. Countries can address the opportunities and disruptions arising in the employment sector through development strategies that focus on technology aided industrialization, education and training, skill development and trade facilitation. G20 can support these efforts by offering the right ecology of international cooperation and coordinated policy response to trade and investment facilitation, education and human resource development and social policies.

Challenge

The world of work is changing due to advancements in technology, innovation, automation, robotics, digital platforms and greater connectivity. The effect of the digital economy is most advanced in corporate applications and industrial systems; therefore, on investments, hiring, skill training and trade facilitation policies.

Africa and developing Asia have a young population and a growing labor force—a highly valuable asset in an aging world. The two regions are urbanizing faster than any other region. By 2034, Africa's working-age population is expected to be 1.1 billion, larger than that of either China or India (MGI, 2016). Developing Asia on the other hand has the largest regional labor force in the world, with nearly 2 billion workers. The Asian labor force is projected to grow by 0.5% annually from 1.9 billion in 2015 to 2.1 billion in 2030 and 2.2 billion in 2050. (ADB, 2018). India is projected to account for 30% of the regional total labor force by 2030, and countries with relatively young current populations, such as Nepal and Pakistan, will experience larger increases in their labor force and need policies to ensure an adequate number of productive jobs.

Opportunities and disruptions arising in the employment sector can be addressed through development strategies for regions which are in different stages of industrial development. Structural transformation and employment generation policies in developing Asia and Africa must understand, prepare and respond to the new digital economy as the latter will affect the patterns and geographical location of industries, employment, trade and economic growth. Industrialization and participation in global value chains are important for growth and employment generation. The approach to gradual industrialization and employment for young population has been affected by the new digital economy which has abruptly arrived in developing Asia and in Africa. These regions are especially vulnerable to decreased investments in manufacturing and jobs being replaced by automation, robotics and artificial intelligence (AI) as they are not deeply integrated in the regional or global value chains (GVCs). They face the dilemma of matching their existing development stage with global

demands for industries driven by new technologies, new skills and an entirely new set of business ecology. The improved levels of automation and robotics in workplace and factories may further reduce the opportunities for employment and enterprise.

The policy challenge before these countries is to ensure that the digital economy does not promote uneven development and must provide impetus for greater investments in less developed firms, regions and countries. (UNCTAD, 2017)

In East Asia's example of trade and investment led growth and economic development, foreign direct investments (FDI) facilitated the industrialization of this region and its integration into the GVCs. Many countries in developing Asia and Africa have a young demography which aspire for similar growth but require development strategies to continue to attract investments in industries and integration into domestic, regional and global value chains. While manufacturing activities and deeper integration in GVCs still matter in the digital economy, the rationale and suitable policy focus and skill adaptations through which developing countries in Asia and Africa can meet the challenges posed by digital economy are explained in this policy brief.

Proposal

Industrialization and deeper integration in GVCs contribute towards the prosperity of a region and helps accumulate physical and human capital. It integrates the informal and formal economy and generates demand for agriculture, mining, and other raw materials, as well as for energy and information technologies, while it increases the supply of products for consumer markets, construction, and other sectors.

Industries and Manufacturing will still Matter in Digital Economy

Manufacturing is at the heart of industries integrated into the GVCs in Asia, although in the context of resource rich Africa and some parts of developing Asia, industrial activities around processing and refining of raw commodities

would be a significant aspect of industrialization led growth. FDI facilitated East Asia's industrialization and structural change, and its integration in the GVCs. The "Flying Geese" model of industrialization, where investments in production of goods continuously moved from more developed countries to less developed ones with lower labour costs, is synonymous with growth in East Asia. The East Asian experience in employment led growth can be extended to Africa, South and Central Asia and other similar regions which must create growth and employment simultaneously for people. However, suitable adaptations to newer and often disruptive elements of digital economy are required in such growth strategy.

With Right Policies and Education and Training, Developing Countries in Asia and Africa can Continue to Attract Investments in Manufacturing and Provide Employment led Growth

The traditional approach to gradual industrialization and employment for young population has been affected by Industry 4.0 and new digital economy, which have abruptly arrived in developing Asia and Africa. These regions are suitable for investments in labour intensive industries which can employ large number of young populations. But these are equally vulnerable to reduced investments in manufacturing and jobs being replaced by automation, robotics and AI as they provide relatively unskilled labour and services. The development strategy for employment led growth in these regions must therefore consider a multidimensional approach to industrialization, trade and integration in the regional and global value chains in which industrial development is matched with higher spending on education and development of skills and training for adapting to digital age technologies and improved productivity.

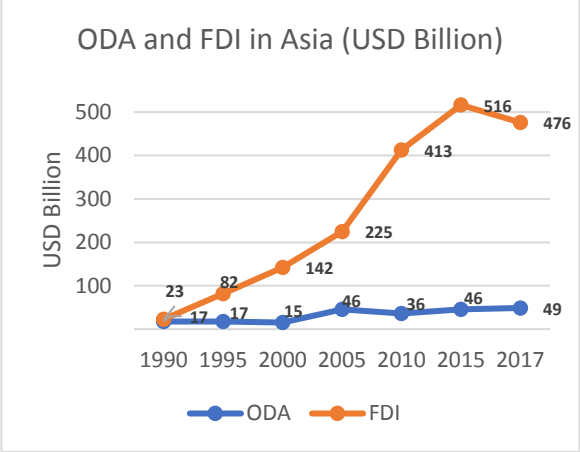
The onset of digital economy has coincided with China and other important East Asian economies' graduation from low-skilled manufacturing jobs and moving up the ladder in value chain of production. With improved productivity and rising wages, labour intensive manufacturing jobs are likely to move to the developing regions of South Asia, Africa and even Central Asia. Since the digitization of manufacturing, automation and AI are still evolving, the quantitative importance of newly emerging businesses and their impact on

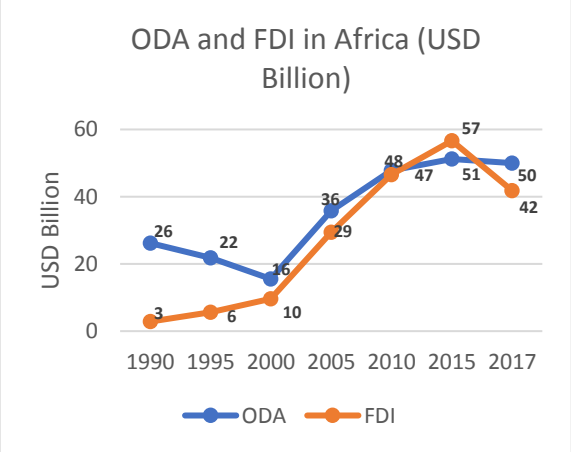
employment cannot be directly measured yet. However, both employment and real wages are expected to grow due to technological change. Excess of workers in occupations where new technologies are expected to replace human will be absorbed by an increased labour demand in activities where these technologies makes humans more productive (IMF 2018). These elements of digital economy should be incorporated into the development strategies with focus on appropriate policies for investments, education and training, social security, and trade facilitation.

Increased Investments will Ensure Employment Led Growth in Digital Age

Increased investment in Africa and many parts of developing Asia is required for industrialization, for moving up in the value chain of production and consumption of goods and services, and for its integration in the GVCs. Africa particularly requires a weaning away from official development assistance (ODA) and create conditions to attract FDI, leaving ODA-led growth behind.

Figure 1. Foreign Direct Investments and Official Development Assistance in Asia and Africa





Source: OECD, 2018. UNCTAD, 2018.

FDI for industrialization in Africa is increasing and manufacturing is the second highest destination after oil and gas sector. Rising wages in East Asia are creating perfect opportunity for the investments to explore and move towards

Africa and other parts of Asia. After Europe, Asian companies are the highest investors in manufacturing opportunities in Africa, increasingly shifting the manufacturing activities to the low wage regions in Africa. Intra-African investment are also becoming increasingly significant, just as intra-Asia investments sustain the growth in Asia.

Manufacturing will not diminish in the digital economy. The nature of manufacturing however will undergo change in which digitization of manufacturing will be leveraged to the benefit of optimization and integration of production processes of goods and services. The geographic span of the GVCs will expand and their concentration may also shift from current locations. Production and consumption of goods and services will occur in newer locations and platforms. Despite being in different stages of economic growth, countries in Asia and Africa can resolve the important issue of engaging human capital, employment, growth and industrial development in digital age through five important policy actions.

Policy Actions that will Enable Employment Led Growth in Digital Age

Investments in industries and employment led growth in the age of automation, robotics and AI requires: 1) Policy Focus on Industrialization and Investment Facilitation, 2) Education and Social Policies, 3) leapfrogging and Feedback (interoperability) of Technology, and 4) Resource Allocation, Expansion and Training of Human Resource.

Policy Focus on Industries and Investment Facilitation: Industrialization is uneven across Asia and nascent in Africa. It differs by countries, regions, and industries. Availability of high and medium skilled worker is a strong driver of investments in digital age. However, opportunities for the agricultural and resource-based economies are not exhausted yet. Creating suitable investment climate for industries is the first step towards using these opportunities. Development of plantation agriculture, mining, labor-intensive industries such as garment and footwear, electronic and electricals are open for these countries, especially when labour costs are rising in East Asian manufacturing hubs.

African countries with lower levels of industrialization can follow the example of Cambodia, Laos and Myanmar which have just begun to participate in machinery production networks. Bangla Desh is an example of attracting investments in labour intensive manufacturing. Prolonged dependency on labour intensive industries must be minimized by acquiring technology capacities and capabilities to move up in the value chain of production or expand into digital technology. Additionally, dynamic application of technology and skills between agriculture and industry, digital economy and agriculture will reduce any adverse impact of digital economy and automation on low skilled labour.

Education and Social Policies: In a digital economy, robotics and automation can substitute for labour, though some skills will be more replaceable than others (IMF, 2018). While robots and automation enhance productivity of high skilled labour, they can replace the low-skilled ones. The degree of substitutability is still uncertain but countries attracting investments in labour intensive industries must continuously upgrade the skills of work force for better absorption in the workplace. Therefore, access to higher quality education should be made universal as it helps to acquire advanced skills and knowledge required in a digital economy.

Higher education spending leads to improvements in human capital and reduces the share of low-skilled workers in work place. Higher education spending is a more efficient policy option as it adds to the human capital of low-skilled workers and allows them to profit from technological progress. It also makes low-skilled workers scarcer, boosting their wages (IMF, 2018). While spending matters, the quality and adaptability of education will make the difference in preparing workers for change.

Appropriate social security policies and social safety nets complement education policies and help bridge the income gaps between high skilled and low skilled workers. Incentives for domestic relocation of labour also helps in absorption of low skilled labour in the job market.

leapfrogging and Feedback of Technology: It certainly takes time to go through

the different stages of industrialization. Some countries/regions could skip certain stages and leap frog into a higher level of development. With right set of skills, digital economy enables possible leap-frogging from the pre-globalized world to active participation in trade through technology and connectivity. For example, in Africa, export of cut flowers and horticulture is made possible through air transportation and commercial connection. Likewise, leap-frogging is possible in developing Asia through software outsourcing (Kimura, 2018). With the right amount of human capital and digital connectivity, software-related jobs can be created even in remote areas. These opportunities may be limited in size, but countries/regions should capture any new business opportunities and employment avenues made possible by the feedback and leapfrog of technology. These opportunities will however be possible with some minimal levels of policy environment, infrastructure and human resource capacities discussed above.

Employment in digital economy is also possible through feedback of new technologies to old industries. This is especially important for structural transformation of labour where even if existing industrial structure is not fully transformed, new piecemeal technologies can be used for upgrading old industries. Development of food value chains, use of smartphones and remote sensing in agriculture are some examples.

Trade Facilitation: For employment led growth in digital economy requires some trade and investment facilitation policies, especially in services and e-commerce. Industrialization and job growth take place when markets for goods and services are available. Income levels in Africa and Asia have already started to rise substantially. The rate of urbanization is also fast. Most countries will experience rapid growth in demand for manufactured products in the near future - from processed food and beverages to electronics, appliances, and labor-intensive goods like clothing and footwear. This implies a greater movement of intermediate goods among countries. Thin trade border and low tariffs will facilitate movement of goods, people and capital. Trade policies that remove or reduce tariff barriers can have a benign effect on many African and Asian countries' participation in the regional and global value chains, especially for manufacturing industries such as motor vehicles, basic metals, and textiles, leather, and footwear which have long value chains.

Free trade agreements and regional trade agreements are important to keep tariffs low and promote greater GVC participation. A good example comes from Southeast Asia region, which have comprehensive free trade agreements with regional partners and enjoy high levels of GVC integration.

Training and Expansion of Human Resource: Human Resource is central to the employment ecosystem, especially in the digital age. The quality of a country's workforce is directly related to the country's flexibility, productivity, and ability to innovate. Investors value skills and productive capacity of workforce. Supply of skills is an important consideration for multinational when making investment decisions since a trained (or trainable) labour force helps to increase productivity and streamline operations. National investment in schools, universities and vocational training institutions will therefore be very important. Besides investment facilitation, the quality of human resource may likely become the decisive factor for attracting investments in a digital economy. Strategic and selective training for sectors with export or investment potential is an important policy action, with further investments in courses to equip people with skills needed to be more productive.

Investment in human capital should ensure both access to and quality of education in schools and college. Promotion of science, technology, engineering, entrepreneurship, and mathematics in formal education is a must. Given the high uncertainty about which skills are needed at any point in time, educational and training systems need to be flexible in responding to market demands. Labour force participation could be encouraged by changing norms related to gender roles, by getting more women to enter STEM fields (science, technology, engineering, and math). It includes building capacities for entrepreneurship and self-employment through business training, skills upgrading, vocational and on-the-job training (IMF, 2018).

Policy Recommendations for Employment Led Growth in Digital Age

The G 20 meeting and its Ministerial bodies should shape the international cooperation for policies leading to employment led growth in digital age. In particular:

- A calibrated combination of trade and investment facilitation measures, preparing the job market -especially the youth- with the skill sets required for new digital economy, is required in every country.
- Policies for creating attractive investment climate for industries is important.
- A closer partnership between governments and private sector to equip people with skills needed to be more productive in digital economy is necessary. Quality of human resource will likely become the decisive factor in a digital economy.
- Prolonged dependency on labour intensive industries must be minimized by acquiring technology capacities and capabilities to move up in the value chain of production or expand into digital technology.
- Programmes for training and skills upgradation will reduce the substitutability of robots with labour. Higher spending on education is an inevitable policy action.
- Change of norms related to gender roles, with more women encouraged to enter STEM fields (science, technology, engineering, and math).
- Social security policies and social safety nets are strongly recommended as they complement education and training policies and fill the income gaps between high skilled and low skilled workers.
- Flexibility in domestic policy ecology will help to skip certain stages and leap frog into a higher stage of development. High-value agriculture is highly feasible for those countries where agriculture is the largest employment sector.
- Creative sectors, tourism and bio-industries should be facilitated more as these can avail the opportunities and reduce the challenges arising from automation, robotics and AI.
- Trade policies that remove or reduce tariff barriers can have a benign effect on many African and Asian countries' participation in the regional and global value chains, especially for manufacturing industries.

Coordinated Policy Response from G 20 Bodies and Processes

G 20 is mandated to support policy actions for growth, productivity, innovation, job creation and development. G 20 Leaders should call on the T 20 and other leading multilateral bodies such as OECD, WTO, World Bank Group and IMF to

help the G 20 countries better understand impacts of new digital economy on job creation, employment led growth and development.

The G 20 Trade Ministers meeting and Education Ministers meeting can exchange and coordinate the above policy inputs on trade and investment facilitation, education and human resource development and social policies. This will enable a coordinated response to new opportunities from and mitigation of the adverse impact of technological change. Such policy collaboration can extend to G 20 Africa Partnership, since employment opportunities in Africa will be greatly impacted by digital economy. A special interface with Y 20 and B 20 on the theme of "Future of Work and Education for the Digital Age" must be created in the G 20 series of events.

Given the fast evolving and hitherto uncertain nature of the effect of digital economy on the future of work where industries, workforce, human resource development, social and fiscal policies, trade and investment and inclusive growth are intertwined, a highly cooperative, coordinated and persuasive policy action from G 20 is recommended.

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