

How Does Technology Influence Income Distribution and Employment in Libya

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ABSTRACT: This paper examines the impact of technology on income distribution and employment patterns in Libya. As the country navigates through economic recovery and transformation, understanding the role of technology becomes crucial. The study analyzes how technological advancements—ranging from automation in various sectors to the adoption of digital platforms—affect labor markets and income inequality. The research highlights the opportunities presented by technology for increasing productivity and job creation, while also addressing the challenges of displacement and skill gaps among the workforce. The findings suggest that while technology can enhance economic growth, its influences vary significantly across different sectors and demographics. This paper concludes with recommendations for policymakers to foster an inclusive technological transition that mitigates disparities in income distribution and promotes equitable employment opportunities in Libya.

1. INTRODUCTION

Libya is a North African country that has a lot of natural resources which plays an important role in the economic development. Libya has been undergoing fast transformation with the help of technological advancement across multiple sectors of its economy. These technological advancements have enhanced the potential of the nation. The primary objective of this paper is to carry a depth examination of the ways in which technology shapes the Libyan economy.

Technology's far-reaching influence on income distribution in Libya is evident in its profound impact on the labour market. The nation's journey towards modernization and the automation prompts a shift in the types of skills coveted by the workforce. The repercussions of this transformation on income distribution are nuanced, contingent on the adaptability of the labour force to this ever-evolving employment landscape.

The enhancement of technological progress fuels the demand for skilled workers has been shifting wage levels upward and potentially emphasising disparities in income if the availability of such skilled labour remains limited. Conversely, if the existing workforce contends to acquire the essential competencies required to remain relevant in the job market, this may lead to a widening gap in income inequality. A significant segment of the population might then find itself facing the disheartening prospects of underemployment.

The complicated relationship between technology and employment in Libya unfolds as a multifaceted narrative. While automation and digitalization have the capacity to displace traditional job roles, they also occur in employment prospects within growing industries. However, the transition from conventional employment to technology-driven roles is not always seamless. The existing workforce may encounter substantial challenges while determined to adapt to the demands of these positions. Hence, it becomes imperative to scrutinize how technology exactly shapes the broader employment landscape and the mechanisms in place to facilitate the workforce's adaptation to these transformative changes (Hbaci, Ku, and Abdunabi, 2021).

Moreover, the consequences of technology on income distribution and employment interlink with Libya's education system. The accessibility to quality education and training emerges as the essential for equipping the workforce with the vital proficiencies needed to harness the benefits of technological advancement. A robust educational framework that imparts these essential skills can contribute substantially to a more equitable income distribution by empowering individuals to compete effectively in the contemporary job market. In contrast, differences in access to education and training can further widen the gap of income inequality as individuals with limited opportunities for skill development contend with the challenge of securing well-paying positions within the technology-driven economy.

This paper further deeply into these complex dynamics by precisely examining the role of technology in various sectors of the Libyan economy, encompassing agriculture, manufacturing, services and education. Furthermore, it will explore the government's

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initiatives and policies thoughtfully designed to stimulate technological progress while addressing the challenges, including the presence of job displacement and the necessity of upskilling the workforce.

2. TECHNOLOGY AND INCOME DISTRIBUTION

2.1 Automation and Job Displacement

In the environment of the global economy, technology's influence on income distribution takes centre stage and Libya is also affected by this transformative trend. Among the multiple types of this influence, one of the most significant pertains to the rise of automation and the subsequent displacement of traditional jobs. As technology advances, it has the capacity to automate routine and low-skilled tasks, a shift that can reduce wage disparities and slow income concentration in sectors where highly skilled workers are in high demand (Moria, and Elmnifi, 2020).

Automation process that substitutes the human labour with machinery and digital systems, stands as a transformative force reshaping industries and labour markets not only in Libya but across the globe. In Libya's attempt for technological advancement and economic diversification, the nation is experiencing this model shift.

Another type of motivations for the automation in the country lies in the reach for increased productivity and reduction in cost, particularly in the industries such as manufacturing, agriculture and services. Automated processes frequently outperform human labour in terms of efficiency and consistency when it comes to executing repetitive and routine tasks. While this presents enhanced efficiency and cost savings for businesses, it simultaneously gives rise to the displacement of workers whose roles are susceptible to automation.

The consequences of automation on income distribution unveil a dual-sided effect. On one hand, highly skilled workers responsible for designing, operating and maintaining automated systems may experience a considerable boost in their incomes. Their expertise becomes indispensable to businesses, elevating their value and making their services highly sought after. Consequently, the wages of these high-skilled workers may surge, contributing to income concentration within this segment of the labour force.

On the other side of the spectrum, low-skilled and routine job positions confront the threat of displacement due to automation. Typically associated with lower wage levels, these positions are disproportionately held by a significant portion of the population. As these jobs decrease, the workers reliant on them may encounter challenges in finding alternative employment opportunities. This difficulty can cause wage disparities as the labour force competes for a decreasing traditional, non-automated jobs (Almigheerbi, Ramsey, and Lamek, 2019).

To comprehensively understand the impact of automation on income distribution in Libya, it is imperative to scrutinize the specific sectors where automation is most prevalent. Like many developing nations, Libya aspires to enhance its manufacturing sector. Automation within manufacturing can result in heightened efficiency, diminished labour costs and enhanced product quality. Nevertheless, this progress carries the implication of reduced demand for manual labour in factories, potentially exacerbating job displacement and wage disparities. Automation's footprint in agriculture is expanding globally, promising increased productivity and decreased reliance on manual labour for tasks such as harvesting and crop maintenance. In Libya, where agriculture plays a pivotal role in the economy, the adoption of agricultural automation can significantly influence rural income distribution. The services sector encompasses a wide selection of jobs, spanning from retail to customer support. Many of these positions entail routine tasks that are open to automation through chatbots, self-service kiosks and other digital solutions.

Confronting the challenges arising from the impact of automation on income distribution necessitates a proactive approach focused on the restoration of displaced workers into the labour market. Libya's workforce must adapt to the evolving job landscape by acquiring new skills that are in demand in a technologically advanced economy. In this context, government policies and educational initiatives assume paramount significance as they can serve as means in facilitating upskilling and reskilling efforts, ensuring the labour force remains competitive in the ever-evolving job market.

2.2 Skill Requirements and Wage Disparities

In the environment of Libya, similar to numerous nations undergoing technological transformation, there is a surge in demand for specific digital skills. This growing need bears significant implications for income distribution, often causing wage disparities between those equipped with skills and those without them. This section will unravel the connection between skill prerequisites, wage inequalities and their affect on income distribution within the Libya (Khalil, and et. al., 2023).

The fast technological evolution has provoked a high demand for individuals with specialised digital skills, particularly in domains like information technology, data analysis, software development and digital marketing. As businesses and industries in Libya increasingly pivot toward digital technologies to sustain competitiveness and innovation, individuals possessing these coveted skills wield a considerable advantage in the employment landscape.

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This phenomenon initiates wage disparities that primarily depends on the skills individuals bring to the table. Those bearing demanded digital proficiencies often have the leverage to command higher remuneration due to their unique expertise. Consequently, workers in technology-related fields typically enjoy more substantial incomes in comparison to their counterparts engaged in more conventional or routine-based occupations. These wage disparities can be huge and have significant affect in shaping income distribution throughout Libya.

The implications of wage disparities predicated on skill talents encompass on one end of the spectrum, individuals endowed with demanded skills enjoy high income mobility, augmenting their economic well-being and potentially contributing to the concentration of wealth within few professionals. This progression sets the stage for a gap between the earning potential of those in technology-related domains and those operating within other sectors.

Workers in low-skilled or repetitive roles may get low or decreasing incomes, which results in widening income disparity. The incapacity to acquire or adapt to the requisite digital competencies may give individuals to continued wage stagnation or even the presence of job displacement, thereby worsening income inequality within the nation.

The educational and training systems within Libya play a pivotal role in determining who can share in the technology-driven labour market. Those who gain access to quality education and training programs that impart digital skills acquire a distinct advantage within the workforce. However, this very advantage can amplify income disparities between urban and rural regions and worsen distinctions amongst various socioeconomic layers (Belazi, and Ganapathy, 2021).

To combat the wage disparities stopping from the growing demand for specific digital skills, several strategies like the Libyan government can channel resources into education and training programs that equip individuals with the digital skills indispensable in the contemporary job market. This initiative encompasses enriching curricula, vocational training and endeavours to promote STEM (Science, Technology, Engineering and Mathematics) education. Concerted efforts should be mounted to ensure that individuals from all levels of society enjoy equitable access to educational opportunities that prepare them for careers intertwined with technology. This entails rectifying disparities in educational quality and bridging gaps in resource accessibility. Enabling the spread of SMEs and startups in the technology sector can spawn a more diversified selection of job prospects and reduce wage disparities. Government policies incentivizing entrepreneurship and innovation prove particularly effective. The implementation of progressive tax policies can furnish a counterbalance to the wealth redistribution. This model entails taxing higher-income earners at high rate to finance social programs that help individuals with lower earnings making a more equitable economic landscape.

By implementing these strategies, Libya can navigate the environment of digital skill demands, mitigate wage disparities and cultivate a more balanced income distribution, driving the nation toward an equitable and inclusive technological future (Hbaci, Ku, and Abdunabi, 2021).

3. TECHNOLOGY AND EMPLOYMENT: DIGITAL ENTREPRENEURSHIP IN LIBYA

3.1 Digital Entrepreneurship

Online startups are resulting in importance in sectors such as e-commerce, digital marketing, software development and app-based services. The attraction of digital business lies in its lower entry barriers, potential for rapid scalability, and access to global markets. These businesses often necessitate a relatively modest initial investment and can be launched from virtually any corner of the country depending upon internet accessibility.

The impact of digital business on employment is far-reaching. These emerging businesses often require a workforce to develop and oversee their digital platforms, manage marketing efforts, provide customer support and handle logistics. This translates into job creation, particularly benefiting individuals with digital skills or the ability to acquire them. Furthermore, these enterprises can stimulate the broader economy by engaging local businesses for services such as payment processing, delivery logistics and cloud computing solutions (Salama, Isaac, Habtoor, and Ameen, 2020).

The favourable effects of digital business extend beyond job generation. These ventures contribute to economic growth through revenue generation, tax contributions and the cultivation of innovation. In a nation like Libya, diversifying the economy away from reliance on the oil sector is important and digital business emerges as a viable route to enhance economic resilience and sustainability.

To ensure that digital business contributes to more comprehensive employment and economic development in Libya can be by expanding access to high-speed internet in rural areas is essential to bridge the digital gap. Government investment in technology infrastructure can make substantial for entrepreneurs in these regions. Initiatives promoting digital literacy and entrepreneurship education in rural areas can arm individuals with the skills and knowledge necessary to engage in digital business. The government can introduce policies that incentivise startups and small businesses, particularly in under developed regions. This may include tax incentives, access to funding and streamlined regulatory processes.

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The establishment of business incubators and co-working spaces in such areas can furnish businesses with essential support, mentorship and resources to facilitate the launch of their ventures (Layas, Asbali, and Benmusa, 2022).

Through the implementation of these strategies, Libya can strive for a more inclusive and equitable distribution of the benefits conferred by digital business, erasing regional disparities and propelling the nation towards a future marked by balanced employment and economic growth.

3.2 Bridging the Digital Divide

The digital gap due to the unequal access to technology and the internet, casts a substantial shadow over Libya, with wide implications for employment and economic participation. Policies and initiatives geared towards addressing this digital gap allow the potential to play a pivotal role in extending online job opportunities to more Libyans contributing a positive impacts on employment prospects and overall economic development (Lihniash, Egdair, and Ahmed, 2019).

In a world progressively reliant on digital technologies and online platforms, the digital divide emerges as a challenge. It causes disparities in access to information, education, employment and economic opportunities. Libya, in particular, grapples with this divide, with urban and coastal regions enjoying superior connectivity and technology access, while rural and less-developed areas face pronounced disparities.

The implications of this digital divide for employment is great as the range of job opportunities online continues to expand, individuals bereft of reliable internet access find themselves at a marked disadvantage. They are unable to harness the remote work opportunities, online education or digital businesses. Consequently, their access to income-generating activities and participation in the modern job market is drastically reduced.

To address the digital divide in Libya an approach including infrastructure, education and inclusive technology access policies is important like the extension of high-speed internet access constitutes a fundamental stride toward bridging the digital gap. This involves broadening coverage to rural and remote regions. The promotion of digital literacy and technology education assumes pivotal importance in ensuring individuals can maximize online opportunities. Initiatives encompassing schools, community centres and online platforms are instrumental in disseminating essential digital skills (Hbaci, Ku, and Abdunabi, 2021).

The reduction of internet access costs stands as a pillar for enhancing accessibility to a broader segment of the population. Government subsidies, tax incentives for internet service providers and allowing competition in the telecommunications sector all contribute to more affordable access. The establishment of public internet access points in rural and underserved areas offers individuals a gateway to online resources, job opportunities, and online learning. Government policies promoting equitable access to technology and the internet has regulations ensuring equal access to services, funding for technology adoption in underserved regions and initiatives geared toward stimulating entrepreneurship and employment in these areas.

A more digitally connected population can serve as a backbone for innovation, allowing digital businesses and stimulate economic growth across various regions of Libya. This is particularly feature as the country endeavours to diversify its economy, moving away from oil dependency and fostering opportunities for all its citizens (Elareshi, 2020).

4. GOVERNMENT POLICIES

Government policies has immense influence over the technology, income distribution and employment in Libya. Thoughtfully prepared policies can nurture economic opportunities, bridge the digital divide and ensure that the advantages of technological progress extend to every stratum of the population. This section ventures into the pivotal role of government policies in fostering equitable income distribution and employment within the context of Libya's technological metamorphosis.

Libya, similar to numerous nations stands at a crucial stage in its economic evolution, with technology being a central role in shaping its future. The policies and initiatives of the government stand as decisive determinants dictating whether the benefits of this technological advancement are distributed widely or concentrated within specific segments of the population (Alsharif, Hebrisha, and Ahmed, 2023).

Digital literacy constitutes the base upon which individuals can engage with technology, access online education and explore employment prospects within the digital economy. The government can support digital literacy through initiatives in educational institutions, community centers and online platforms that furnish training in digital skills. By ensuring that citizens possess the requisite knowledge to navigate the digital environment. The government empowers them to participate in the modern job market making income parity.

Furthermore, technology adoption stands as driver of economic growth and employment. The government can stimulate businesses to embrace digital technologies through incentives, tax breaks and regulatory frameworks that buttress technology adoption. This motivation can augment the competitiveness of businesses, spawn fresh job prospects within the technology sector and propel economic growth.

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To mitigate the digital divide, the government can adopt a strategic approach like government investment in technology infrastructure constitutes a backbone. Extending internet coverage to rural regions is instrumental in ensuring that all citizens share equal access to the digital environment. Policies aimed at reducing the cost of internet access can render it more accessible to a broader range of the population. This may include subsidies, tax incentives for internet service providers and measures to foment competition and affordability. The institution of public internet access points in underserved regions provides a venue for individuals to access online job opportunities, engage in online learning and harness digital resources. Enabling the growth of digital entrepreneurship, particularly in rural areas can grow job opportunities and stimulate economic expansion. Policies incentivising business and innovation prove particularly effective in this. The implementation of progressive tax policies can contribute to wealth redistribution and enrich the adverse impacts of wage disparities on income distribution (Kezeiri, and Lawless, 2023).

This can further result in the increase in the rates of the employment, the main focus within rural and regions that are under developed. Also, reducing the digital divide not only redounds to the benefit of the individuals but also substantially contributes to the overall economic development of the nation. A more digitally interconnected population can enable innovation, nurture digital entrepreneurship and stimulate economic growth across diverse corners of Libya, an essential concern as the nation strives to diversify its economy away from oil dependence and nurture opportunities for all its citizens.

5. CYBERSECURITY AND DATA PRIVACY

In rapid technological advancement environment, concerns regarding cybersecurity and data privacy have risen to the front of public awareness. As an increasing number of types of our lives transition into the digital environment, the imperative of safeguarding sensitive information and ensuring the integrity of online transactions has never been more important. To nurture the adoption and production of digital transactions and services, it is imperative to make regulations and protective measures that cultivate trust and confidence in the digital environment (Wright, 2022).

The persistent increase of technology has resulted in a fundamental transformation in how individuals, businesses and governments interact and execute their functions. From online banking and e-commerce to telemedicine and remote work, digital transactions and services have entrenched themselves as integral components of our daily existence. Nonetheless, this increased dependence on technology has also resulted in vulnerabilities prone to exploitation, thereby allowing data breaches, cyberattacks and violations of privacy.

The establishment of robust regulations and safeguards within the domain of cybersecurity assumes importance for various reasons like the digital environment is a source of sensitive information, encompassing personal data, financial records and trade secrets. Regulations serve as shielding this data from theft, manipulation and unauthorized access. Trust constitutes the keystone of any thriving digital economy. When individuals and businesses harbour faith that their information remains secure, they are more inclined to engage in online transactions and services, enabling economic growth. Regulations can function as a warning to malicious, discouraging them from embarking on cyberattacks in the first place. Additionally, safeguards can facilitate the detection and effective response to approaching threats. Cybersecurity regulations are essential for the preservation of a nation's critical infrastructure, defence systems, and classified government information.

The governments and regulatory entities must engage in collaborative efforts with the private sector, technology firms and cybersecurity experts to formulate comprehensive cybersecurity policies. These policies should span across various dimensions of cybersecurity and data privacy.

Regulations should mention this in rule for the manner for organizations to collect, store and make use of that personal data. The implementation of the laws for the protection of the data, like that of the European Union's General Data Protection Regulation (GDPR) can discuss upon the individuals greater control over their data. Regulations should require that organizations report data breaches and security incidents. Transparency in this regard is pivotal for individuals and businesses to take requisite precautions. Governments can lay down security standards and best practices for organizations to adhere to. These standards can include areas such as encryption, access controls and vulnerability management. The cultivation of cybersecurity education and training for both individuals and organizations is essential. Regulations can incentivize cybersecurity awareness programs. Given the global complexion of the internet, international collaboration assumes a pivotal role. Nations should collaborate to combat cyber threats, share threat intelligence, and harmonize regulations. The imposition of penalties for non-compliance with cybersecurity regulations can incentivize organizations to prioritize security. Mechanisms for enforcement must be in place to ensure the adherence to regulations (Capasso, Czerep, Dessì, and Sanchez, 2019).

For businesses and organizations, investing in cybersecurity is not solely a matter of regulatory compliance but also a strategic authority. Cybersecurity helps in the safeguarding of the sensitive data and also results in the safeguard an organization's

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reputation and customer trust. The financial consequences for the breach in the data and further cyberattacks can be substantial, underscoring that investing in robust cybersecurity measures is a cost-effective approach.

6. CONCLUSION

The infusion of technology into diverse sectors of the Libyan economy has resulted in profound transformations in income distribution and employment. While technology bears the potential to result in new areas for digital businesses and economic expansion, it simultaneously brings forth challenges such as job displacement and income inequalities. This document has precisely scrutinized the multi-dimensional effects of technology on income distribution and employment within Libya, emphasizing the imperative of addressing assorted factors to ensure the equitable dissemination of its advantages.

The variance in access to technology and the internet remains large, with urban areas enjoying superior connectivity and infrastructure compared to rural and marginalised regions. It is upon policymakers and stakeholders to give importance to infrastructure development, affordability and the establishment of public access points, thereby ensuring parity in digital access for all citizens. The act of bridging this divide constitutes means in providing opportunities for digital business and online job prospects, particularly in regions where conventional economic areas may be constricted. Furthermore, the promotion of digital literacy and vocational training stands as an essential in giving the workforce with the proficiencies requisite to thrive in the digital economy. As traditional vocations succumb to automation, individuals must be afforded the occasion to reskill and upskill to preserve their competitiveness in the job market. Government initiatives in the realm of education and training can prove instrumental in addressing this challenge.

As technology continues its evolution, it becomes evident that the relationship between technology, income distribution and employment remains fluid and intricate. Policymakers and stakeholders must retain a capacity for adaptability and collaboration, as they endeavour to harness the constructive impact of technology while concurrently mitigating its potential drawbacks.

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