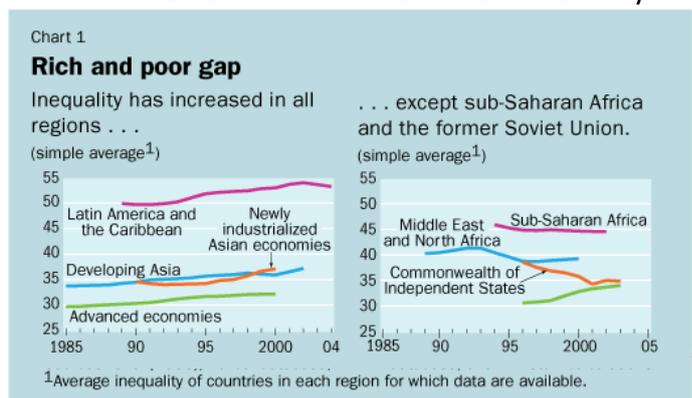


Has the technology industry narrowed or widened the gap between opportunities available to citizens of rich and poor nations?

New technologies such as artificial intelligence, machine learning and robotics are developing every day, quickly taking over our lives. For all the convenience and new innovations technology offers us, what if this rise in technology is actually contributing to exacerbating inequality? Does it have real potential to accelerate development in the poorer, less fortunate nations? Although inequality is on the rise, technology may have the potential to balance it out in the long term and allow the entire world to be on a “level playing field”. After all, it is a “Second Machine Age” and with many parallels to the Luddites and Industrial Revolution.

Globally, inequality is on the rise. Inequality consists of numerous measures, such as economic level and social standings within a nation. The WEF (World Economic Forum) stated in 2017 that “rising income inequality” and “the polarisation of societies¹” poses a risk to the global economy. This global economy is determined by the opportunities available to different citizens around the world and how they are utilised to achieve the optimum result.



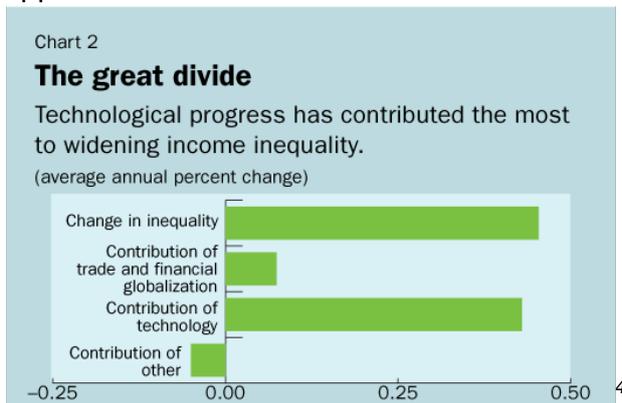
It is widely argued that technology is the driving force for inequality, regardless of whether it is in a rich or poor nation. There has been a rise over the years, with incomes per capita rising across populations but also huge disparities occurring between different countries. In measures of factors which contribute to inequality, technological development is at the forefront. It is commonly understood that with increased income inequality, unequal opportunities are available to citizens of poor nations as compared to those in rich nations³. Income inequality is the harshest form of it. It barely exists in advanced economies as the issue has been tackled a long time ago; developing economies are trying to come to terms with it. Quickly, this is becoming an impossible task. The reason for this is technological progress hindering the possibility of a reduced gap between the rich and poor within the country, leading to second-standard education for many children. This in turn means that later on, they are not likely to be skilled enough to work in a high paid job. The economy would suffer, meaning the gap would therefore continue to exist. This gap in income

¹ <https://www.weforum.org/reports/the-global-risks-report-2017>

² Choi (2006); Povcal database; WIDER database; and IMF (International Monetary Fund) staff calculations

³ <file:///Users/rujlgodghate/Downloads/transition-report-201617-inequality-of-opportunity.pdf>

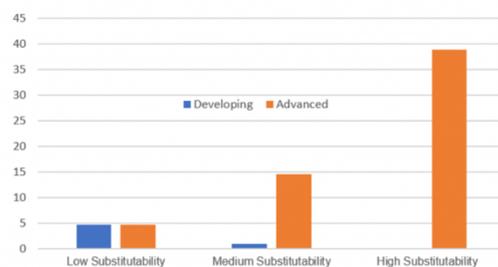
inequality within the poorer nations of the world leads to a vicious cycle: one of reduced opportunities for the different classes within that sect of society.



New technologies such as artificial intelligence, robotics, big data and networks are expected to do wonders for production processes, having a substantial impact on economies. These changes are so large that they are likely to have a detrimental impact on a developing economy, such as that of Argentina⁵. Artificial intelligence risks widening the gap; it leads to the majority of investment being transferred to modern, advanced economies wherein automation is already established⁶. In turn, it causes the negative consequence of redundancies in a growing labour force. The labour force is the backbone of a developing economy and with artificial intelligence threatening this, it means a divergence between a poor nation and its wealthier counterparts.

Diverging income levels

The gap in per capita GDP between advanced and developing economies widens the more easily robots substitute for workers.
(per capita GDP percent changes)



Source: Authors' calculations.



It is widely assumed that robots will eventually replace workers. These “robots” encompass a broad range of terms, from artificial intelligence to the Internet of Things. Robots are said to be becoming “smarter⁸” over time. The next wave of automation is said to overtake even middle-income, white-collar jobs- such as bank tellers and insurance underwriters⁹. Experts are calling it the “Second Machine Age”. The machines of the Industrial Revolution overcame

⁴ IMF (International Monetary Fund) staff calculations

⁵ https://unctad.org/system/files/official-document/ecn162006d2_en.pdf

⁶ <https://www.imf.org/en/Publications/WP/Issues/2020/09/11/Will-the-AI-Revolution-Cause-a-Great-Divergence-49734>

⁷ <https://blogs.imf.org/2020/12/02/how-artificial-intelligence-could-widen-the-gap-between-rich-and-poor-nations/>

⁸ <https://unu.edu/publications/articles/is-technological-innovation-making-society-more-unequal.html>

⁹ <https://www.businessinsider.com/experts-predict-that-one-third-of-jobs-will-be-replaced-by-robots-2015-5?r=UK>

the limitations of human muscle, whereas artificial intelligence now has the potential to overcome human minds.

Robots will eventually replace humans in repetitive manufacturing tasks; the “hourly wage” of a robot is merely \$5-8¹⁰. Higher wages appear to be associated with the use of robots as a substitution. GDP (Gross Domestic Product) is said to diverge further with increased automation and is predicted to cause a bridge between developing and already advanced economies. As mentioned earlier, robots will disproportionately displace unskilled workers and the need for their unskilled labour. This would save huge corporations, who employ dependent people in poorer countries with a commonly capitalist government, a lot of money leading to a huge unemployment gap.

This begs the question: what would an unemployment gap lead to?

A huge unemployment gap would mean that many families would have reduced access to resources that families in more privileged countries can access properly on a daily basis. Education is usually paid in lower income countries- something we take for granted as free of cost. Due to an unsteady income, children are less likely to be educated and would only serve to struggle and this same struggle would then be passed onto their children and grandchildren, leading to entire generations being affected.

Although some say technology generates new income opportunities, there are examples where corporations have exploited their employees, meaning there are discrepancies. In 2017, Uber was fined \$20 million for luring drivers with inflated wage statistics¹¹. The salaries Uber was advertising, with around \$90,000 a year, tempted drivers and pushed them to apply to the company. This is just one way of how more powerful companies with a majority of the stake within the free market can manipulate advertising, pushing it in their own favour.

Advertising like this is especially concerning in lower income countries, where they might not have the resources or even infrastructure to monitor and control what information is publicised about jobs and opportunities. Consumers could be falsely led to believe that they are applying for a well-paid job when in reality, they are bound to a contract that will unfairly and grossly exploit them. The implications this would have are frankly alarming; tricking innocent citizens into taking the opportunity to be employed by a well-reputed, ‘good’ company and then not paying them for the full extent of their labour leads to yet more repetitive events. This occurs multiple times, with citizens of poorer nations being paid far less than they should be, with their employees reaping the benefits of their cheap labour, usually, if not always in a higher income nation. The gap in opportunities remains, if not widened.

It may be argued, however, that technology actually narrows the gap in opportunities, giving poorer nations the chance to be at a level with the richer ones.

Technology allows the lower income nations access to financial inclusion, something which most of these countries do not have the infrastructure for otherwise. According to the World Bank¹², around 2 billion people are unbanked as of 2017. Although this is by no means a low

¹⁰ <https://www.lexology.com/library/detail.aspx?g=1de3cca5-a4b5-416b-8906-c078b8f94735>

¹¹ <https://www.forbes.com/sites/janetwburns/2017/01/23/uber-must-pay-20m-for-luring-drivers-with-inflated-wage-stats/?sh=733ff196191d>

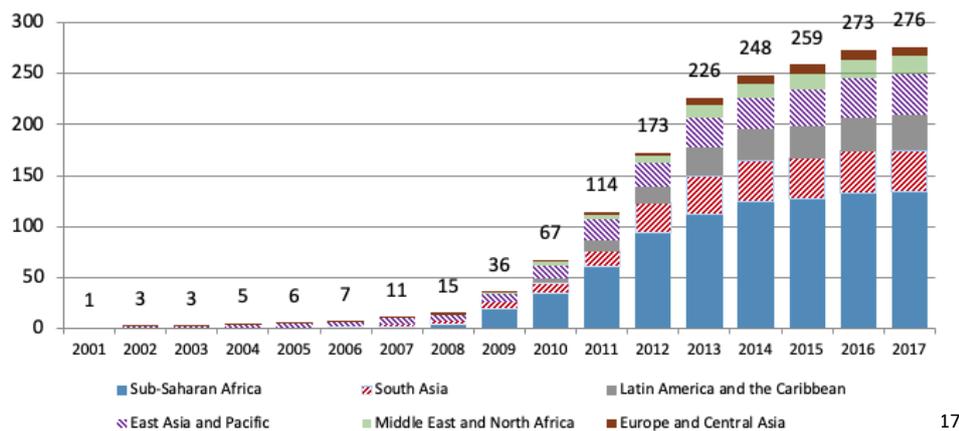
¹² <https://globalfindex.worldbank.org/>

number, it is still 20 percent lower than that of six years ago, due to the increased usage of mobile phones. Mobile technology is said to have “transformed¹³” the availability of financial resources to those in developing countries and by providing increased access to them, it allows for a higher quality of living and better opportunities. Due to rapid progress, there are now over 50 million registered accounts in Sub-Saharan Africa¹⁴, and the number of money services for the unbanked continues to increase.

An advantage of mobile technology is that users invest in the handset and a wider distribution of airtime is allowed through an already present, scalable infrastructure through secure network channels. With this, under-privileged citizens with limited access gain a secure means of transfer and payment at a lower cost, and safe, private storage of funds.

Atkinson (2015)¹⁵, argued that economic inequality is often aligned with differences in the availability of communication technology; now widely available.

Financial inclusion is said to “bridge economic opportunities¹⁶” in low-income countries. It forges a pathway, creating jobs and reducing inequality. With a reduced gap in financial access in rich and poor nations, it seems definitive that the gap itself should be narrowing as this allows for generational progress within families of those citizens who utilise these technological advances.



Another glaring issue in low-income nations is the lack of a legal identity being made clear for all citizens; something seen as a basic human right in developed countries. The United Nations has stated creating a legal identity for all citizens globally as one of its sustainable development goals¹⁸, and so has the World Bank, through its Identification for Development Program¹⁹.

Technology comes in here. Blockchain technology is being used as a “technological mechanism that enables sharing²⁰”. Primarily used to keep track of information, secure transactions and ownerships, it is becoming a widely preferred option as more countries turn to a more digitalised approach.

¹³ <https://voxeu.org/article/economics-mobile-money>

¹⁴ <https://www.gsma.com/sotir/wp-content/uploads/2020/03/GSMA-State-of-the-Industry-Report-on-Mobile-Money-2019-Full-Report.pdf>

¹⁵ Inequality: What can be done? By Tony Atkinson

¹⁶ <https://www.imf.org/en/News/Articles/2016/09/20/sp092016-Financial-Inclusion-Bridging-Economic-Opportunities-and-Outcomes>

¹⁷ Data from the GSMA State of the Industry report (2017) Number of live mobile money services for the unbanked by region

¹⁸ <https://sdgs.un.org/goals>

¹⁹ <https://id4d.worldbank.org/>

²⁰ <https://www.washingtonpost.com/news/theworldpost/wp/2018/01/29/blockchain/?arc404=true>

Legal digital identities are arguably far more important than those concerning financial inclusion as they give the opportunity for better gender equality suited to the volatile economies of developing countries. By giving each citizen a unique identity, it allows them security of right as well as better access to public services, such as health and education. Blockchain has the potential to act as a beginning for a global identity database. This means that the people own their own identity in this situation and no single government or corporation could assert their sovereignty. This would lead to far better opportunities for those in poorer nations as they would not be victims of a corrupt, powerful government, giving them the opportunity and more power to essentially 'forge' their own path. The "systematic barriers" broken down, allowing citizens to invest more safely, thus reducing economic wealth gaps²¹. It enables a more democratic and distributed ownership system in which everyone has a stake in this widely digitalised future of ours, rather than deepening the gap between the rich and poor nations.

Promotion of micro and small enterprises via e-commerce is one way of bridging the opportunity gap. An example of this would be the Chinese Platform Taobao²², part of the Alibaba Group. The largest online marketplace by volume, it has made its way to the top amongst other emerging economies. It allows furniture makers, suitcase manufacturers and any other small producers, even those from small villages, to reach their customers in large cities, or potentially overseas, easily and cheaply. Without this e-commerce platform, these merchants would be unable to reach such a wide market of customers and couldn't sell directly in insufficiently large volumes due to high intermediary charges. E-commerce platforms disproportionately boost small business in rural and remote areas, thus helping equalise opportunity. In addition to this, they also encourage gender equality²³: offline businesses tend to be run by men, whereas their online counterparts are usually female led. Here technological development tackles both the issue of reduced opportunities for business in cut-off areas in poorer nations, and gender equality.

The financial needs of micro and small businesses can also be further met through fintech. The Alibaba Group has many further branches and one of them, Ant Financial, generates credit scores by using various digital indicators such as cash flow data and online customer reviews²⁴. These scores are averaged and used to allow smaller enterprises to take out uncollateralised loans- before, they couldn't obtain traditional bank loans. Research²⁵ indicates that entrepreneurs who received an unsecured loan from Ant Financial had substantially faster growth in sales and other business values than those firms who did not secure such credit. Businesses that received an unsecured loan grew far more than others, suggesting small fintech loans can make a big difference for many micro-entrepreneurs.

The development of various technological industries has provided many benefits for small enterprises in a developing nation, China, and there is no doubt that this can be implemented elsewhere. By allowing smaller businesses to flourish, inequality within a country decreases as more equal opportunities become available, bringing them to the same level as higher-income nations.

²¹ <https://development.asia/insight/how-blockchain-can-bridge-wealth-gap>

²² www.taobao.com

²³ World Bank report: "E-Commerce Development: Experience from China"

²⁴ <https://www.applcoinc.com/blog/ant-financial-services-platform-largest-fintech-in-world/>

²⁵ <http://www.haraldhau.com/fintech-credit-and-entrepreneurial-growth/>

Digital technology also holds out the promise of directly reducing the imbalance in educational resources. Rural schools in developing countries cannot afford the same quality of teachers or provide the latest training for them. As a result, poorer students tend to do less well than richer ones. The YouChange Foundation²⁶ aimed to have students in rural areas receive the same lessons as ones in top schools in Beijing; possible via online video link. As expected, the rural students enjoyed the lessons more and thus the program helped reduce the educational gap within China. With a more equal level of education, inequality decreases; this gives citizens the same opportunities if not a lot more than what was previously being offered to them.

Reducing a gap within the nation is the first step towards equal opportunity within it. The gap would become virtually non-existent and developing nations would, as a result, have the same opportunities as “richer” nations.

Digital technology presents new and exciting opportunities- but public policy also plays a key role. It can only promote economic inclusion if the government of the respective country ensures that every citizen has access to the same infrastructure: a challenging task. Policymakers should also ensure that the correct laws are in place, in which the digital space remains open, competitive and affordable for everyone.

It is clear that technology can be unfair to those who do not have the infrastructure and means for it; some may even go as far to say it that it serves to solely “make the rich richer” as they have free, unlimited access to these resources compared to others, thereby reducing opportunities for the poor.

It is tempting to name it as the main culprit for inequality and disparities in opportunities, but blaming it is merely an excuse to abdicate responsibility. It doesn’t create income disparity, yet increased efficiency and wealth creation. The distribution of wealth and its links to available opportunities is the issue here, rather than technology.

As technology advances and replaces human work, giving everyone an equal shared divide or cut seems to be a viable solution, tackling the issue of the opportunity gap and the “vicious cycle” for citizens. This is already taking place, with Mark Zuckerberg pledging to donate his wealth to those in need of it²⁷.

Economic and social revolutions are not novel to us- we have gone through them before. This time should not be any different. Just like the Luddites and the Industrial Revolution, technology may initially be a threat to social stability and there may be some problems, but in the final transition it has led to a far more developed global economy and benefits for all- including equal opportunities.

²⁶ <http://en.youcheng.org/index/about/about.html>

²⁷ <https://www.nytimes.com/2015/12/02/technology/mark-zuckerberg-facebook-charity.html? r=0>