The New Paradigm for Emerging Economies:

Blockchain

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Table of Content

Author's Note

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Abstract

Emerging economies are considered one of the most globally beneficial business opportunities in the next 10-15 years. However, persistent issues within these economies have kept them from rising to their potential. The aim of this paper is to create a perspective understanding of these challenges and address some potential solutions available through the utilization of blockchain. The paper relies heavily on venture capital fund knowledge in identifying the potential solutions to be capitalized on and where blockchain may best be strategically implemented to unlock said potential solutions.

https://www.nationmaster.com/country-info/groups/Emerging-markets

https://hbr.org/2010/04/the-hidden-risks-in-emerging-markets

https://www.ameriprise.com/research-market-insights/financial-articles/investing/emerging-market-investments/

Introduction

It has been a whirlwind journey for both emerging economies and the “technology hype” that captured global attention. Most people have seen “Emerging Economy” or “Blockchain” thrown into an article or talked about in an academic conversation but rarely have they been thought about together. However, through years of researching the utilization of blockchain in markets and industries of massive potential, I have come to the conclusion that the critical factor lies in both macro and micro-level understanding of both terms. Although many see the potential implications of blockchain in emerging economies, more work must be done to determine exactly where the technology should be implemented to yield the most promising benefits. The sheer combinations of size of the market, necessity to change and create opportunities, and lack of existing infrastructures, is a system architect's paradise as they can create from the ground up and use blockchain technology to turn any emerging economy into a transformational one. Blockchain technology has the ability to improve efficiency, decrease cost, and empower millions of people currently out of the developed ecosystem. Through my years of work in these markets and my upbringing in the emerging economy (i.e. Bangladesh), I have encountered challenges that need both immediate and long-term resolutions. Hence, it has been a lifelong motivation to perceive and incite change through the tool kit I am literate in, technology. There is no technology more equipped to handle the problems of emerging economies than blockchain.

Fundamentals and Challenges of Transformational Economies:

Latest estimates suggest the Global Economy GDP being a staggering 80 trillion US dollars by the end of 2017.

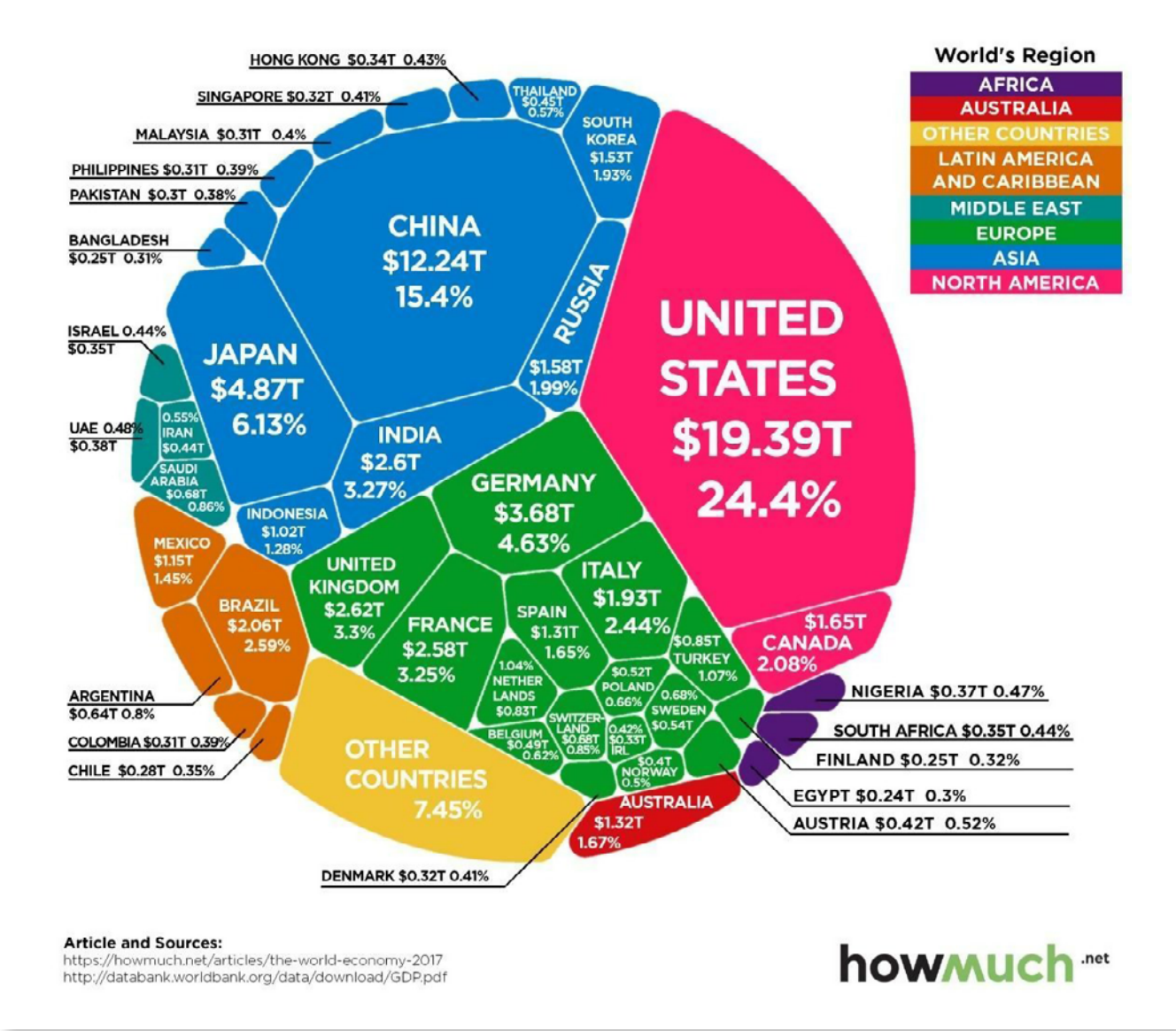


Figure 1. Percentage and amount distributions of global GDP by continent and nation (Raul, 2018).

However, the global economy is dominated by those that are already established. Despite business cycles around the world, it is not easy to beat out some of those established economies. Of the top 20 economies from 1980, 17 are still ranked among the top 20 today, meaning only three new entrants managed to carve out their own portions of the global economy. That statistic alone suggests that established economies form the engine of growth for the global economy. In contrast, the countries with the highest percentage of global population are still unable to capture most of the world's market share. By default, developing countries which comprise 35% of the global population should be able to capture at least that exact amount in the worldwide market. However, that is yet to be the case, and the following factors are highlighted as the reasons why:

1. Corruption: Lack of Trust and Transparency
1. Lack of Infrastructures
1. Inability to Activate or Retain Massive Human Capital
1. Failure to Establish Businesses that Address Local and Global Markets

Truth be told, these are not the only problems; however, in a macroeconomic outlook, these are the problems that are in immediate need of addressing to unlock the true potential of these economies. In fact, according to a report published by S&P Global, "Aggregate emerging market consumption will expand that of advanced economies, and emerging markets will account for an increased sharing of global consumption" (Tanchua & Shand, 2016).

To further stress the prominence of these economies, several global indexes have termed them in many exciting and promising blocs such as BRIC and N-11. Although the perceived determinants have been different in various opinion polls. According to a report published by McKinsey, they state that "The shift in economic power from the West to the East and South is well underway. But not all boats will be lifted by this rising tide. Organizations in growth economies will need to embrace technology and the transition to a service economy if they hope to be globally competitive" (Mobasheri, 2017). Although embracing technology is an essential factor, that these economies need to jump to the service economy to be globally competitive is a questionable statement. Agriculture has been the bread and butter for most emerging economies and the agricultural sector's developments are the reason leading economies are in their current position. Furthermore, global food demand and security issues that are currently being faced in addition to ones predicted in the long-run due to population growth would be made more severe by the loss of smallholding owners to the service economy. The International Fund for Agricultural Development considers smallholding, which forms the bedrock of agriculture sectors in emerging economies, as part of the solution for global food security (Maindola, 2016).

Therefore, it seems irresponsible to discard all traditional industries to facilitate the service sector without addressing the preexisting opportunities that lie within these emerging economies. The duality of co-existence is

far better for the organic development of the ecosystem. According to economists, agriculture was the pillar of the industrial revolution, and in today's perspective, effective and innovative agriculture has the potential to be the pillar of the new digital revolution.

Prior to deciding where blockchain may be best utilized to improve an emerging economy, it is important to recognize the problems that exist across each industry and the opportunities they possess.

Agricultural Industry:

Emerging economies consist of more nearly 2.23 million square kilometers of land, of which approximately 20.34% is arable. These economies rely heavily on their agricultural industries for stimulation, just as the rest of the world relies on them for food security. This dependency has led to emerging economies across the board having higher crop and food production indexes than established ones. With that being said, some may find it surprising to know that despite these numbers, emerging economies actually perform lower than their established counterparts in terms of agricultural growth; an issue with growth attributed to a variety of issues (Emerging Markets: Group Statistics, n.d.).

Consider the case of agricultural sustainability; contemporary agriculture has been characterized by increasing crop yield through the utilization of synthetic fertilizers and pesticides. However, this process has damaged the soil and natural ecosystem, thus hindering the long-term development of crops. Today, nearly 40% of the world's agricultural land has degraded due to either environmental changes or soil problems caused by unsustainable agriculture or mismanagement (Watts, 2017). Emerging economies are not only shown to display higher levels of man-made environmental issues such as CO2 emissions but they also suffer more at the hands of natural disasters as shown by their above-average disaster-related deaths and below-average relief fund statistics (Emerging Markets: Group Statistics, n.d.). As the agricultural industry moves towards a more sustainable crop production model, it is critical for farmers to possess data, information, and recurring feedback on their assets. In most emerging economies, farmers are ill-equipped with any such resources due to lack of infrastructure, cost of information and updates, and little access to knowledge. In addition to sustainability, some other problems plaguing the agricultural industry are:

- Agricultural Finance (Banking, Insurance, Agricultural Commodities)
- Agricultural Management (Value Chain, Adulterations)
- Agricultural Trends (Organic Food, Consumer Demand)
- Agricultural Trade (Global Trade, Transportation, Food Pricing)
- Agricultural Security (Food Security, Growing Population, Lack of Land)
- Agricultural Livelihood (Rural Lifestyle vs. Urban Lifestyle)

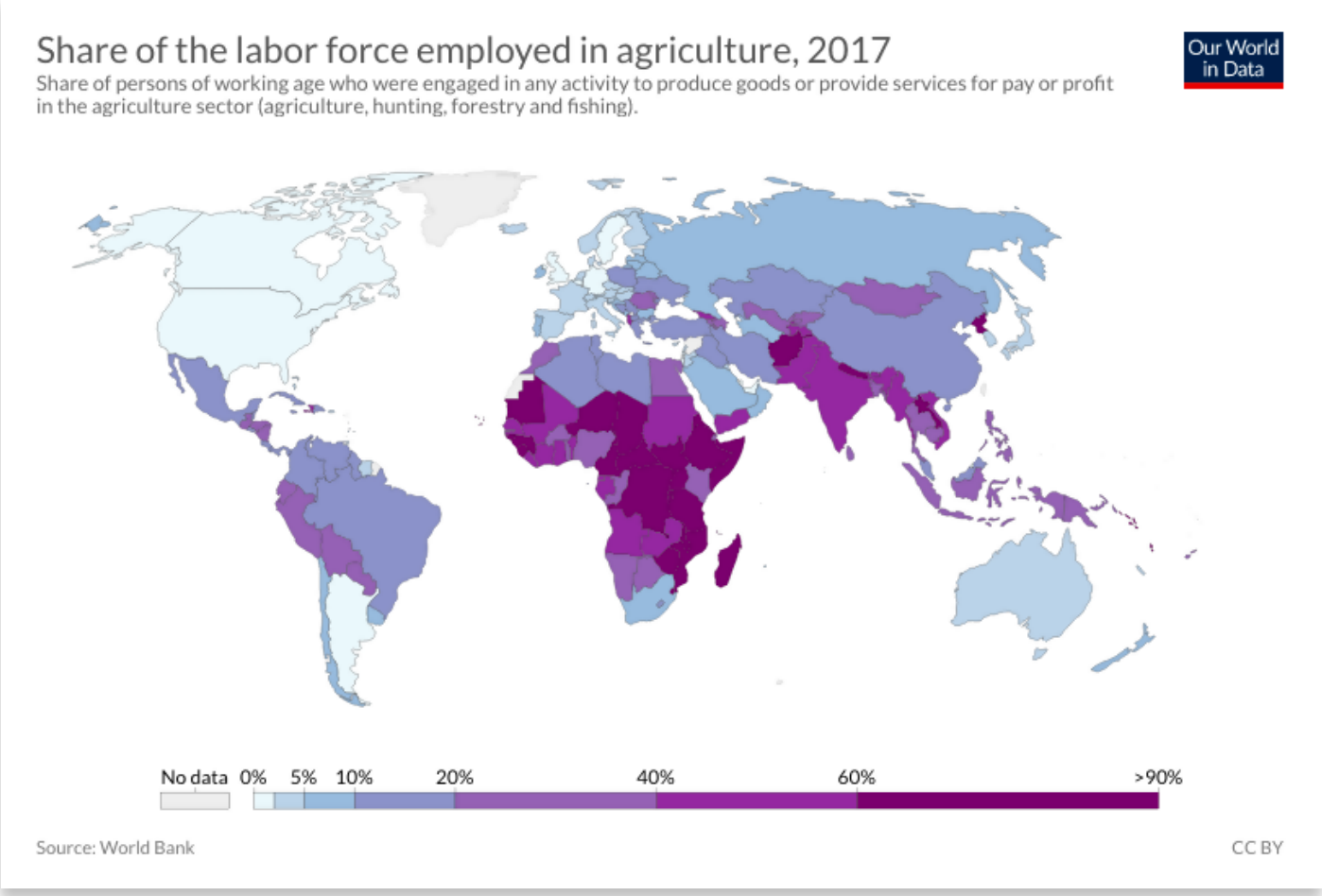


Figure 2. Percentage of each nation's population employed in the agricultural sector in 2017 (Roser, 2013).

Globally, agriculture accounts for almost one billion in global employment and is the largest employer of women in developing nations. Additionally, seven of the ten largest agricultural producers and exporters are considered to be emerging economies and the agricultural sector constitutes a large portion of each of them. Such statistics make it imperative to solve the issues facing the agricultural industry and fully benefit from the emerging economies that have made it their prevalent industry (Employment in Agriculture, 2019). When attempting to solve these problems, one must consider the challenges faced by farmers including extortion and lack of access to financial support, end consumers, quality materials, and storing facilities.

These challenges consistently undermine the potential of the industry in emerging economies. If the problems facing the industry are solved or even mitigated, it could result in a decrease in the cost of production and higher consumption by end consumers due to affordability. Furthermore, farmers with liquidity would be able to focus more on higher output of different crops, thus enabling them to address local and global markets.

Consider the case of Bangladesh, where the agriculture sector accounts for 19.6% of national GDP and employs approximately 63% of the population (Bangladesh-

Agriculture, 2019). In 2017, Bangladesh produced nearly three billion US dollars in exports from the agricultural industry mainly in cotton and sugar (Faruque, 2018). According to the World Bank report, this outlook could be at least doubled with the appropriate exploration of certain opportunities (The World Bank, 2016).

Infrastructure, Urban, and Technological Development Industry:

The transportation sector is a major factor in the long-term development of emerging economies and in this case, it fundamentally restricts the efficient flow of people, commodities, and services. According to a report published by Credit Suisse, nearly 46% of roads are unpaved in emerging Asian countries (Zimmermann, 2018). Emerging economies fall far behind their established counterparts in airports per capita, railroads per capita, and roadways per kilometer. However, their amount of highways per capita is far above-average and could be a valuable tool if not for their recurring issues (Emerging Economies: Group Statistics, n.d.). Some such issues have large effects on the economy as a whole; in Dhaka, the capital city of Bangladesh, approximately 3.8 million labor hours are lost daily due to traffic; an estimated 4.3 billion US dollars worth of productivity (Correspondent, 2018).

Issues with road corruption, safety, and security have halted potential development in Bangladesh and many other developing Asian economies. A multitude of emerging nations struggle with high crime rates and a poor policing force per capita ratio in large urban areas (Emerging Economies: Group Statistics, n.d.). The lack of policing and high rates of crime in some emerging economies are often also accompanied by corruption from law enforcement to politics. When a government official is more interested in their own self-benefit than the overall success of their communities, it can lead to repeated investments into projects that sum to much higher than they should. Although publicly available data did not provide total road construction expenditures for the country, one could reasonably estimate billions of sunk-costs over the past 20 years. In fact, according to a Bangladeshi report published by “The Daily Star”, on-average it costs over seven million US dollars per kilometer more to construct a four-lane highway in Bangladesh as compared to India or China due to lack of competitive bidding, overrun time, etc (Correspondent, 2017).

Solving the roadway and other similar infrastructure issues will ultimately come down to the necessity for clear information and mechanisms to monitor progress. These necessities present opportunities for technology such as blockchain to play a key role in the development process of emerging economies. After implementation, blockchain will allow emerging economies and their developing cities to Developing cities are an obvious component in most emerging economies. The following three visuals represent the potential markets and challenges in such cities.

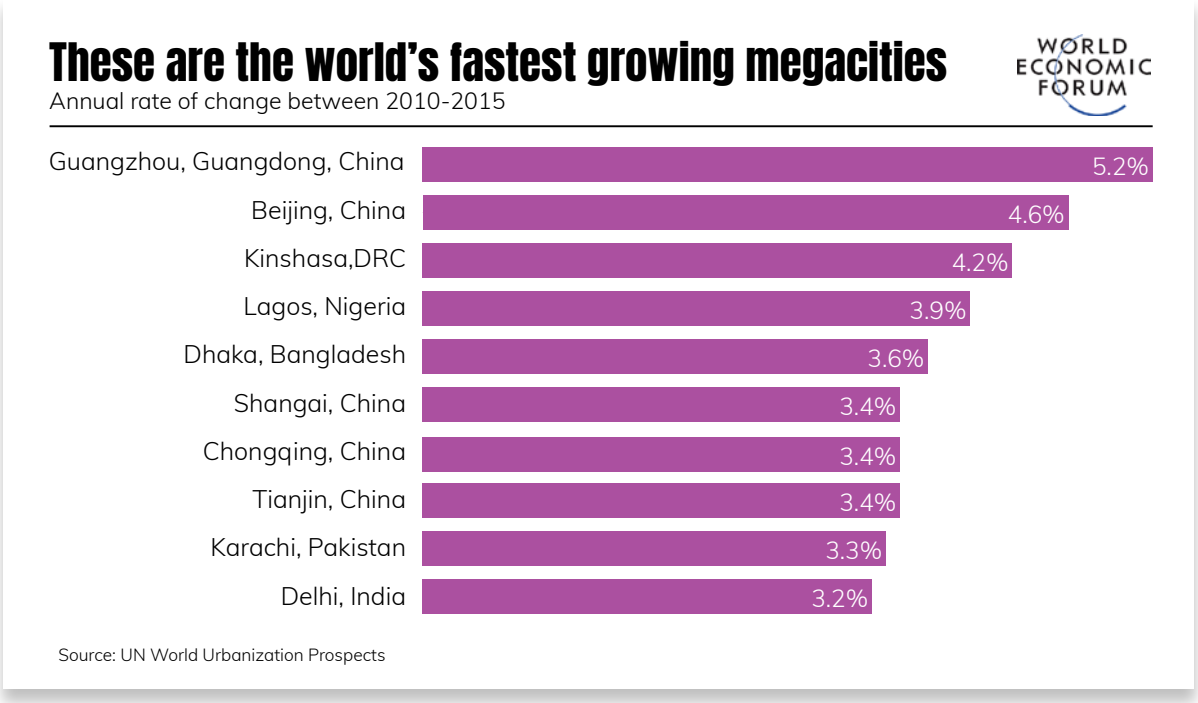


Figure 3. The annual rates of change for the top ten fastest growing cities in the world (Myers, 2016).

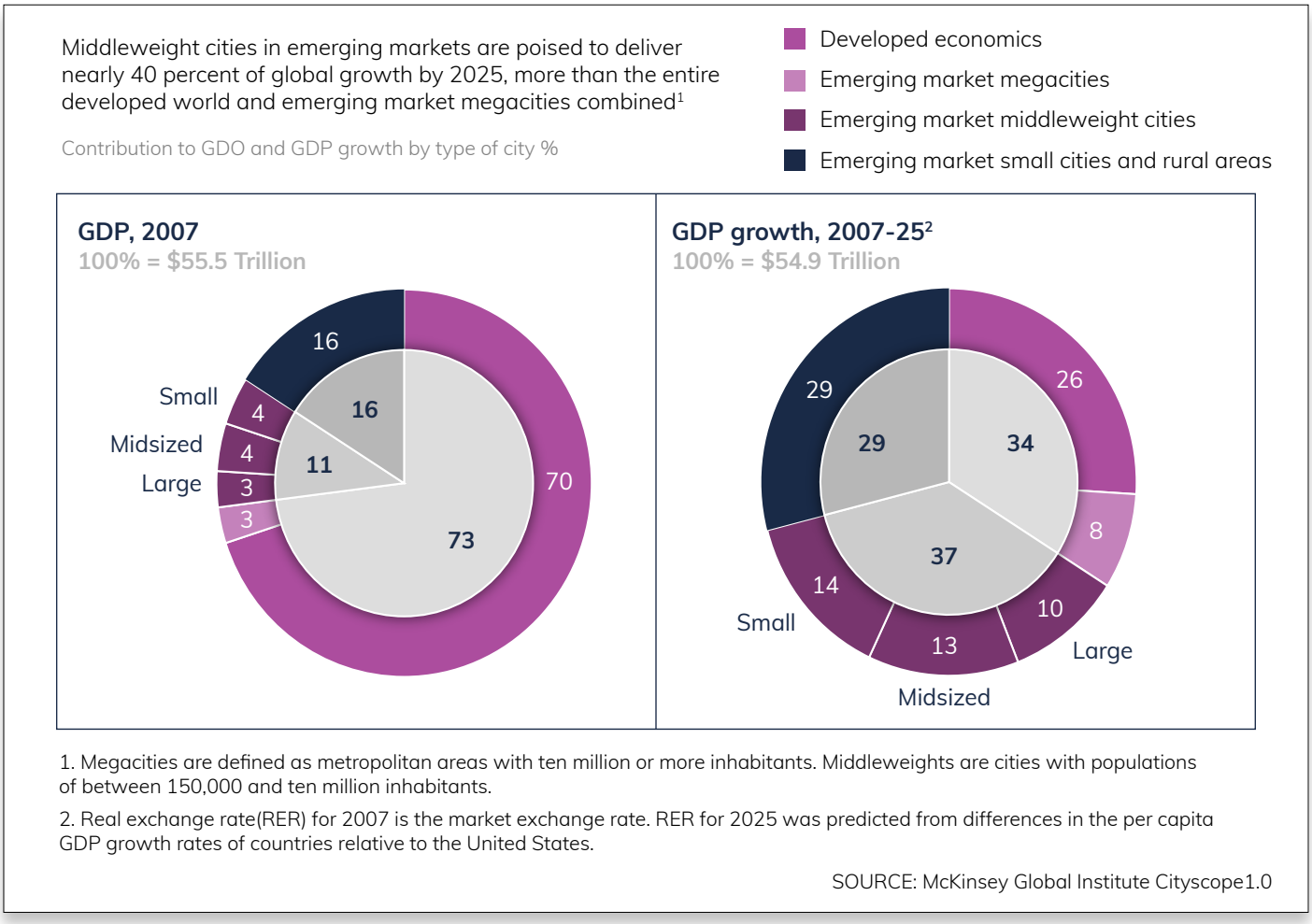


Figure 4. The percent contributions of each type of city to global GDP and global GDP growth between 2007 and 2025 (McKinsey Global Institute, 2011). Emerging market middleweight cities are poised to deliver nearly 40% of global growth by 2025, more than the entire developed world and emerging market megacities combined.

Top cities by growth in given market, 2010-25

Emerging region
Developed region

Rank	Elderly higher-income consumers[1] (aged65+)	Young entry-level consumers[2] (aged 14 or under)	Consumer spending on laundry care products[3]	Demand for commercial floor space[4]	Municipal water demand
1	Shanghai	Lagos	São Paulo	New York	Mumbai
2	Beijing	Dar es Salaam	Beijing	Beijing	Delhi
3	Tokyo	Dhaka	Rio de Janeiro	Shanghai	Shanghai
4	Tianjin	Ouagadougou	Shanghai	Los Angeles	Guangzhou
5	Mumbai	Khartoum	Mexico City	Tokyo	Beijing
6	São Paulo	Ghaziabad	Moscow	Washington,DC	Buenos Aires
7	Osaka	Sanaa	Bangkok	Dallas	Kolkata
8	Chongqing	Nairobi	Istanbul	Sao Paulo	Khartoum
9	Delhi	Luanda	Manila	Guangzhou	Dhaka
10	Nanjing	Baghdad	Johannesburg	Chicago	Istanbul

1. With household income >$20,000 at purchasing-power parity.
2. With household income of $7,500-$20,000 at purchasing-power parity.
3. Based on city-level market-demand-growth model.
4. Includes replacement floor space.

Source: McKinsey Global Institute analysis

Figure 5. The top ten cities for each growth category between 2010 and 2025 (McKinsey Global Institute, 2011).

Looking at the visuals, one can't help but think about some of the issues currently plaguing the cities listed: the cost of affordable living, the essential supplies and infrastructure for accommodating a large number of people, and the safety and sustainability of the cities themselves.

The three problems above are only a snapshot of the list that needs to be resolved prior to economic progress. According to a report published by McKinsey, "By 2025, cities worldwide will need to spend at least $10 trillion more per year on physical capital—everything from office towers to new port facilities—than they do today. In building construction, the new floor space required will be equivalent to 85 percent of today's entire residential and commercial building stock" (Dobbs; Remes; & Schaer, 2012).

That being said, individuals may be able to gain early-mover benefits by adopting strategic approaches now: whether that be developing better understandings of demographic and income trends or learning

the market dynamics of specific products in target cities. Information such as how emerging economies have a significantly lower pre-adolescence percentage of their population and a higher elderly (65 and up) percentage than the average may be critical for social planning. Planning such as creating assisted living projects to care for an aging population or investing in ways to decrease infant mortality and the number of stillbirths (Emerging Economies: Group Statistics, n.d.)

Many cities also lack proper safety regulations; Dhaka, for instance, recently suffered a series of deadly accidents in business facilities that have claimed many lives (Nadi, 2019). As incidents like those tend to repeat, one must think about the measures that are necessary to avoid future dangers, which will be far more complicated due to the increase in population and growth of the city.

Technology will play a critical role in transforming these cities into "Smart Cities," but first proper application and development processes must be established. In previous cases, technology is developed by the established economies and then presented to the emerging ones as a market. The issue with that solution is that most emerging countries are presented with unique problems associated with their cultures, customs, demographics, terrain, etc. Therefore, it is far more critical to develop localized technology to address the issues that exist within the specific community.

In fact, in the paper "Why is Africa Poor?" the authors, state "non-adoption of apparently highly productive technologies such as wheeled carts or new methods of ploughing were not appropriate to the African context and was particularly driven by perverse causes of facilitating slave trade or creating dependency of the locals to an already known and efficient process" (Acemoglu & Robinson, 2010). Such development inhibitors seem to provide young companies within emerging economies an environment in which they are forced to be content with their local technological capabilities. They lack the research, resources, and infrastructure to satisfy their technological needs as well as face the possibility that any development has the potential to disrupt the preexisting local economy (Yusuf, 2017). Opportunity lies in the readiness for and embracement of these technologies through customization.

In summary, the critical takeaways for emerging economies in technology are:

1. Raise knowledge, awareness, and readiness
1. Harness new technologies to build localized capabilities
1. Formulate strategies to create value-added services for existing vendors to address local markets (such as overcoming language barriers and gaining market insights among others)

Governance, Finance, and Commerce Industry:

Governance is subject to various challenges in the economic development process; whether they be traditional or unexpected. Emerging economies' governments must find solutions to the same problems all governments must: protecting its citizens being one of them. Fatalities due to terrorism acts, terrorist organizations active, and political violence are all untamed in emerging economies when compared to some of the more established ones. Additionally, emerging economies lack the forces to solve these issues internally; despite having a significantly larger portion of their populations fit for military service, they are below average on military personnel per capita. It has already been mentioned how other internal policing forces are subject to bribes and corruption; this, combined with an inadequate national military makes several large-scale operations impossible (Emerging Economies: Group Statistics, n.d.). Some issues governments face are less-ordinary, one example being when the Financial Policy Council explicitly listed an "Open and Transparent PPP Bid Process" as part of the solution to tackle existing challenges in emerging markets (Kowlessar, 2018).

The final objectives of e-governance, as cited by the United Nations Development Programme led by Information and Communications Technology innovations are: transparency, efficiency, effectiveness, accountability, justice, and reliability and participatory democracy (Alam, 2012).

This sort of e-governance is expensive and challenging to establish due to factors such as the majority of the citizens in some emerging economies not having access to the internet and the lack of essential hardware such as connection infrastructures, advanced servers, and security systems to protect public data and information (Shil, 2016). The cost of creating a functioning e-governance in a developing city could be upwards of one billion US dollars, no small fee for an economy with a plethora of other problems and financial stresses (Zambrano & Seward, 2013). The reality of these situations prompt the questions of if and how an emerging economy would be able to obtain an e-governance while also minimizing costs?

Financial services, unlike some of the aforementioned areas, are an area where emerging economies believe presents prospects. As of now, emerging economies are looking at various opportunities for economic growth through remittance, addressing the unbanked and underbanked markets, and reducing cost for financial and cashless services.

Bangladesh stands as the 9th highest remittance recipient country in the world at 15.9 billion US dollars which accounts for nearly 4.58% of its GDP (Ahmed K.A., 2018; The World Bank, 2018). The actual figure is reported much higher but does not appear so in the statistic due to the country's reliance on informal systems such as "Hundi". Such intra-social methods of transmitting remittance have been estimated to handle approximately 24.9% of total remittance currently

accumulated with more yet unaccounted for (Hussain, 2014).

It is of utmost importance to bring these informal remittances to a formal system. Large portions of these remittances are used by family members, for property and land acquisitions, and for education and medical services. Whenever a state imposes capital controls preventing the free movement of funds, markets such as the "Hundi" are established. Furthermore, the central bank in its continuous efforts to enforce foreign exchange regulations becomes increasingly intrusive in trying to limit the "Hundi" market.

Foreign exchange may be entirely outside of Bandladeshi financial institutions' sphere of influence; however, the "Hundi" market will actively adjust their exchange rates to divert remittances enough to satisfy demands (Cookson, 2018). If demands increase, a higher proportion of remittances will be redirected to the "Hundi" markets and if they decrease the opposite will occur. Creating programs such as PSI (Pre-Shipment Invoicing) to reduce the amount of under-invoicing, improve traceability, provide education services, and reduce the cost of cross-border payments are some examples of measures being taken benefit fully off of the remittance market. Matt Bakker beautifully summarizes what the remittance market means for emerging economies in his book, "Migrating into Financial Markets", in summary his thoughts are:

a. In some of the frontier "least developed" countries, remittances are now a more critical source of financial aid than official development assistance (ODA). For example, in 2012, Africa received 60 billion US dollars in total remittances whereas they only received 44.6 billion in ODA. Similarly, remittances have also reached higher levels than private debt and portfolio equity, and average almost 60% of foreign direct investments in developing countries.

b. Remittances have not only proven to be higher as other sources of financial inflows, but they are also seen as more resilient to external economic shocks and are counter-cyclical in nature. Indeed, while a foreign government is likely to cut ODA when its own economic growth slows, family members are less likely to do so. Similarly, family members are more likely than foreign investors to invest more when a developing country faces difficulties (Bakker, 2015).

The other major prospect in the financial industry is the unbanked and underbanked market. As shown in the visual below, approximately 1.7 billion adults remain unbanked, of which adults in emerging markets account for a large share.

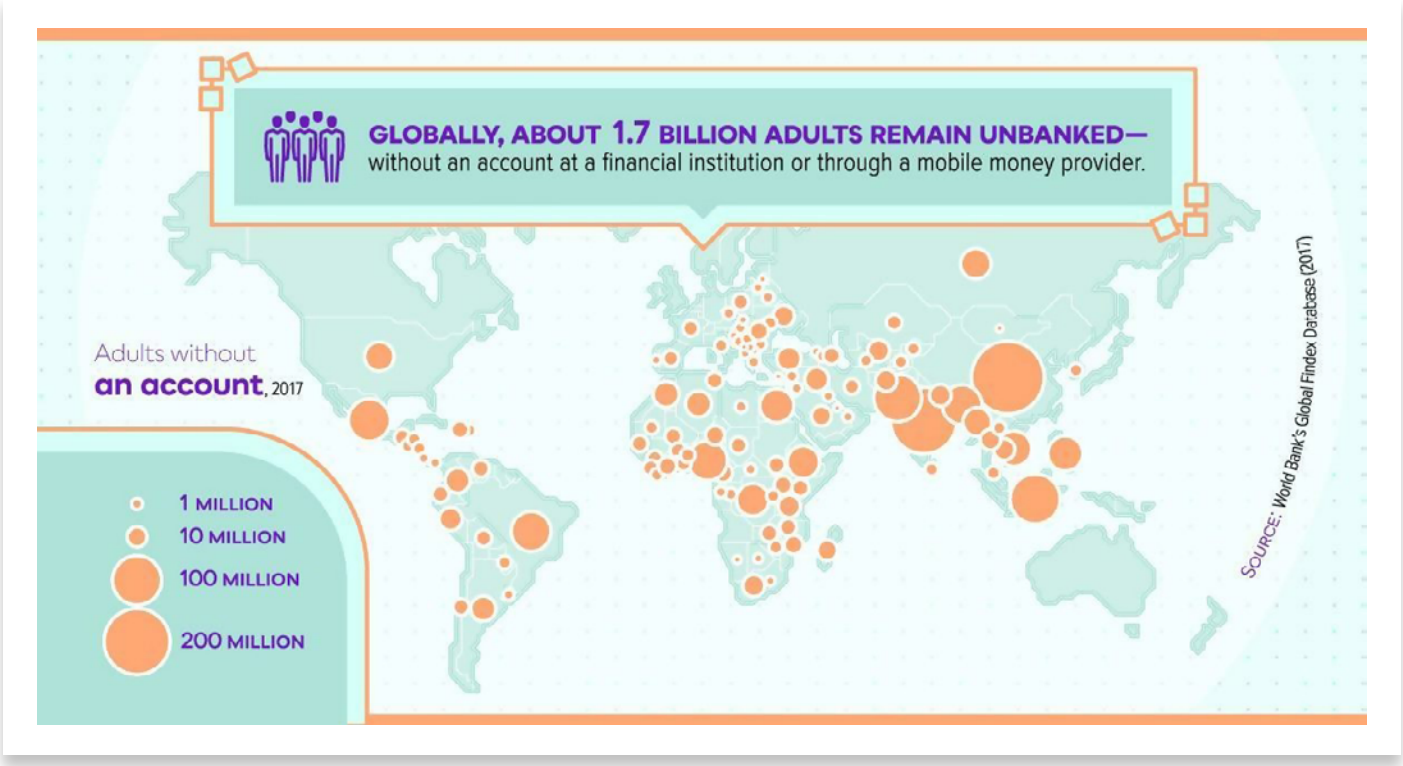


Figure 6. The amount distribution of adults living unbanked in the world (Demirguc-Kunt, Klapper, Singer, Ansar, & Hess, 2017).

Bangladeshi mobile financial service use has grown approximately 120% every year since 2011 and although strides have been made in Bangladesh through MPS (Mobile Financial Services) such as bKash, where an estimate shows 22% of the population is using it; it remains as mostly domestic person-to-person transfers. According to one study, 85% of Bangladeshi mobile money users don't have a bKash account and only 20% have a bank account, which leaves a staggering 80% as unbanked and only 3% of the population with a mobile account. With the majority of transactions being domestic transfers and payments, rural Bangladeshi are not interested in saving money. They want to be able to send money via mobile services to their families so that they can avoid loans and thus safeguard their families (Bryzek, n.d.).

Further showing that sentiment holds true across developing economies, India has shown that by lowering bank transaction costs, hundreds of millions who were previously unbanked created accounts. In 2011, 65% of India was unbanked; now, with the introduction of the JDY (Prime Minister's People Wealth Scheme) and similar programs, that has fallen to 47%. Of the accounts opened in that time frame, 60% were in rural areas and they have an accumulated deposit of approximately 10 billion US dollars.

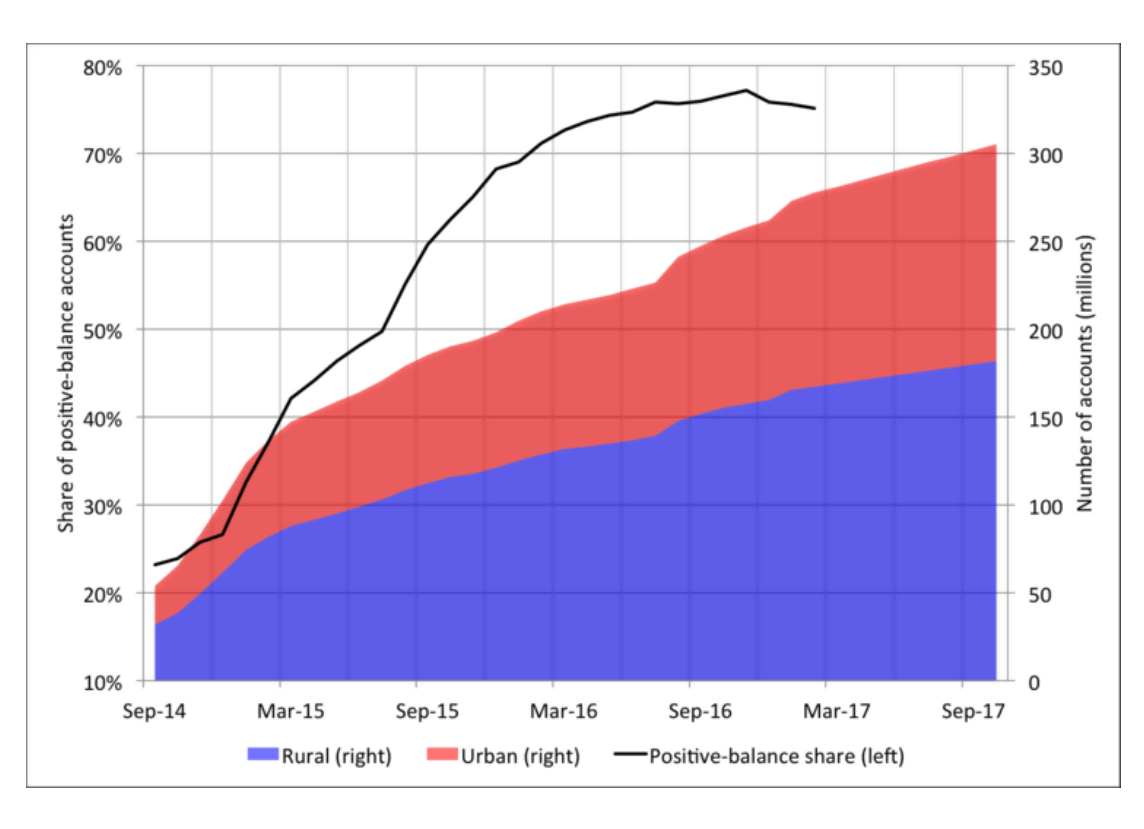


Figure 7. The total number of bank accounts in India as well as what portion of them are positive-balance and their distribution between rural and urban areas (Asktrakhan, 2018).

When considering financial inclusion, an emerging economy should contemplate making the following changes:

1. Closing the small business credit gap at average lending spreads and conservative estimates of fee-based services.
2. Including unbanked adults in the formal financial system and raising their financial services spending levels. Social dividends- Banks at the forefront of financial inclusion for low-income consumers will be well-positioned to reap both economic and goodwill value in return. It is important to note that 70% of microenterprises have a bank account, but only 5% have access to term loans from banks and only 1% have access to working capital loans from banks (Accenture Banking, 2015). This is not limited to SME's, Smallholding farmers, startups, etc.
3. Improving access to banking where physical banking infrastructures are expensive and challenging. In fact, with technology, alternative distribution approaches have emerged, such as the MFS.
4. Setting appropriate products to address various sectors of the unbanked and thus designing it fit their needs.
5. Marketing the use of banking services as attractive to encourage the participation of low-income or otherwise dormant consumers.

Real Estate and Housing Industry:

The housing/real estate markets represent a major opportunity for emerging economies. Due to their lack of debt in prior to the 2008 global financial crisis, their housing markets remained largely unaffected by it and as a result now stand as key investment targets for interested parties. Unlike the majority of established companies, their growth has not been hindered by the crisis, making them something of a scarcity (Real Estate in Emerging Markets, 2009). Also, as previously mentioned, remittances received are primarily utilized in the real estate and housing industries where they can dramatically stimulate economic growth in emerging markets but like in the industries previously mentioned, there are issues. There was once an occasion where myself and few of my family members were discussing with a "Dalal" (Real Estate & Land Sale brokers in Bangladesh who are predominantly used as intermediaries to locate and purchase properties) who happened to come across a "property" with prospective potential for us. The property seemed vaguely familiar and after searching through old paperwork we were astounded to discover we already owned the property the agent was now trying to sell us. This is just one example of the corruption and potential confusion large emerging economies can experience in their housing industries. Faulty paperwork, duplication of documents, and unreliable purchasing modalities are just a few of the many problems at present.

In developing nations such as Africa, it is possible for landowners to not know where their property ends and the next begins. The problems associated with recognizing correct ownership may be further aggravated by opposing cultural or government views on ownership, corruption and extortion, and incomplete documentation showing ownership of a given area (Ramabodu, Kotze, & Verster, 2007). Additionally, populations in emerging economies are migrating out of rural areas and into urban districts in search of better economic opportunities. The flow of people with few financial resources into large urban areas will require affordable housing in large quantities as well as a means to organize leasing/ownership contracts with individuals who have little-to-no experience with such material. J.P. Mei of the Stern School of Business brought up another interesting point when he said "Of the 3.3 billion Asians alive in 1995, some 1.7 billion, or around 52 percent, are under the age of 25. Over the next 20 years, most of these 1.7 billion people will find jobs, get married, and start families." (Mei, n.d.). He then went on to explain the importance of emerging economies developing secure and easy-to-manage mortgage lending methods to accommodate the growing demand for home ownership.

Emerging economies often experience increases in population that are more dramatic than the rest of the world; as a result, they require an efficiency within their real estate and housing industry that isn't currently there. In India the industry is expecting an annual growth of 11.2%, yet has struggled to solve some of its most pressing issues. Problems including the cost for buyers and developers are estimated to increase 10-20% due to project delays, outdated building

bye-laws, and a lack of financing needed to develop housing for their growing population (Joshi, 2018).

Department of Estate members and authors of "Challenges of International Real Estate Investment in an Emerging Economy: The Nigerian Experience"; Alexander Udobi, Ichie Kalu, and Chikwendu Elekwachi wrote:

"According to Jones Lang LaSalle (JLL, 2006), cross border transactions represented 42% of total real estate investment volume, an 8% increase from the previous year. This signifies the rapid globalization of real estate as an asset class, much of which can be attributed to the growth in the emerging market economies. As a result of rapid GDP growth, the emerging markets are expected to experience a disproportionate expansion in the real estate sector to accommodate a growing industrialized workforce and the increasing demand for a large number of assets. In 2006 alone, Russia's real estate market expanded 700%, and JLL reported steady deal flow in China, Turkey, Mexico, and Brazil (JLL, 2007)" (Udobi, Kalu, & Elekwachi, 2016).

According to Proptech consultants James Dearsley and Andy Baum "Proptech (Property Technology) is one small part of the wider digital transformation of the property industry. It describes a movement driving a mentality change within the real estate industry and its consumers regarding technology-driven innovation in the data assembly, transacting, and design of buildings and cities" (Darbyshire, 2019).

New technology platforms such as AirBnB (Home-Sharing Platform) have fundamentally changed the manner of business in the traditional Real-Estate and housing industry. It's due to this fundamental change that emerging economies must now resolve both their traditional housing industry problems and those that accompany the shift in technology, such as:

1. Ensuring the transparency, authenticity, and documentation of real estates and land.
2. Creating products and services such as: attractive financial packages to address a population who doesn't have access to financial services and mechanisms that replace the role of intermediaries to capitalize on the identification-authentication processes.
3. Creating and developing systems capable of monitoring for pricing discrepancies and instabilities in real time to ensure current developments, services, material, and safety features.

After all pertinent problems are resolved, the real estate market and land ownership market will expedite to at least double. The following image of the property trends in Manila provides an interesting insight into what I predict is the case in most emerging economies.

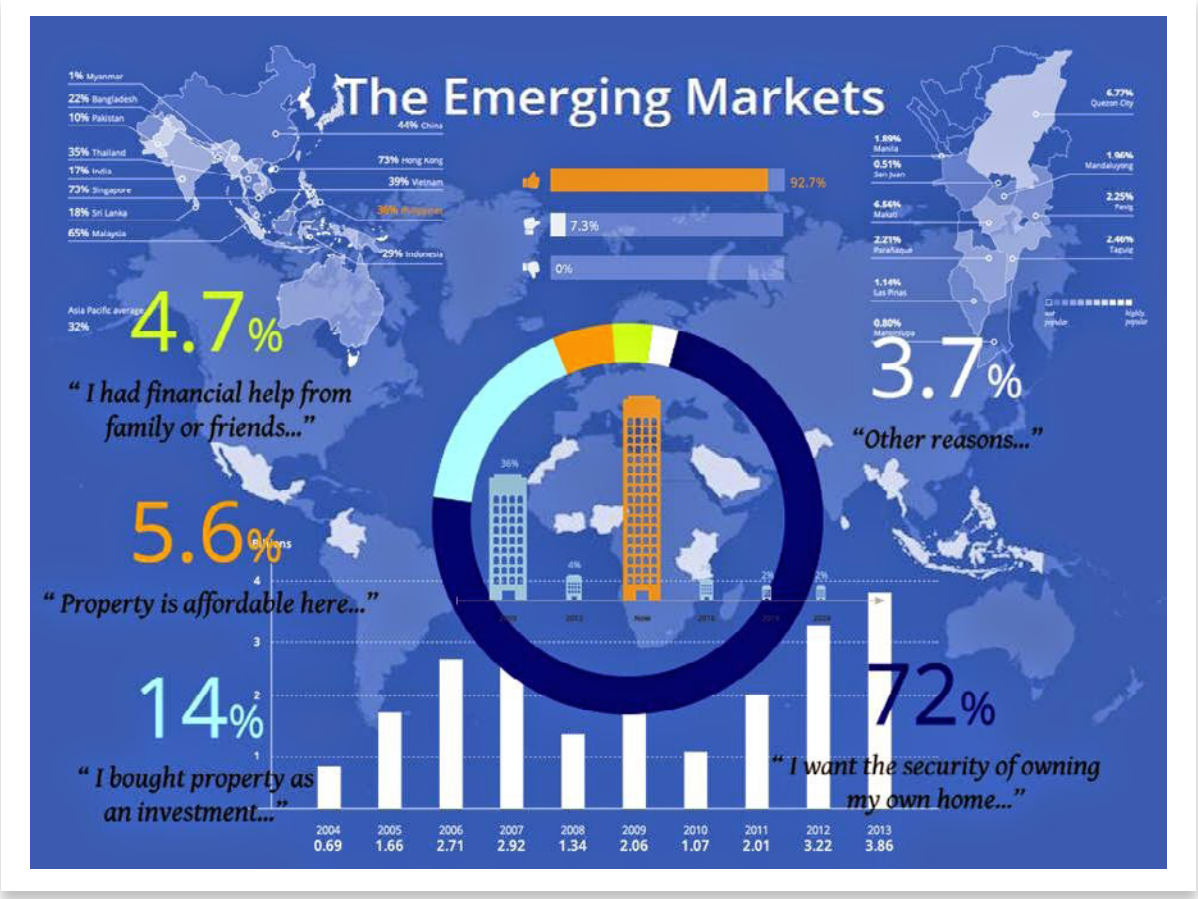


Figure 8. The percentage distribution for why individuals purchased property in emerging markets (The State of Real Estate in the Emerging Markets, n.d.).

Education and Workforce Industry:

Nowhere are skills more in demand than in emerging economies, according to a human capital study by PwC (PricewaterhouseCoopers, n.d.). Although emerging economies tend to appear below average on certain things such as the percentage of their population that is literate, as a whole emerging economies do not score particularly poorly in terms of amount of education received (Emerging Economies: Group Statistics, n.d.). Therefore, the troubles emerging economies are facing with their workforces may be less to do with their education level so much as quality of education at the levels attended and impacts of their careers.

In the past, emerging economies relied on "brick-and-mortar" type labor to fuel their export-driven economies; however, their economic model is changing and as a result they have to move up the value chain rapidly – or risk failing.

The following is pulled from an article published by The Guardian:

"According to the Talent Shortage Survey by global employment agency Manpower Group, skills shortages prevented 45% of employers in the Asia-Pacific region filling

vacancies. In India, this number soared to 61% of employers, while in Brazil 68% had trouble recruiting the right workforce. Developing nations have to narrow the skills gap and 'produce more workers capable of doing talent intensive jobs that require higher qualifications'.

While this shortage in human capital can be seen as a weakness, it also presents a massive opportunity for economic growth. Developing and emerging economies – with populations that are overwhelmingly young and hungry for professional advancement – can turn themselves into 'factories of talent,' instead of being the 'cheaply-staffed' workbenches of the developed world.

Currently, however, the education systems in many of these countries don't provide the right kind of training that would fill the skills gap. There is plenty of anecdotal evidence to support this claim. For example, developing countries do not have enough resources to purchase tools to build modern skills. There are also hard numbers: in two of the fastest growing emerging economies in the world – Turkey and Brazil – nearly 10% of all companies report that poorly educated workforces are the main constraint on their growth" (Kim, 2014).

In the past, the majority of skilled workers emerging economies have been able to produce in using their education systems were lost due to "brain drainage" in unskilled positions. This may be the cause of emerging economies severely falling behind in terms of patent application; with well skilled and highly educated workers being employed at positions they are overqualified for, they are unable to utilize their knowledge to bring innovative ideas to their communities (Emerging Economies: Group Statistics, n.d.). It is easy to turn towards lack of technical ability and education to excuse an underperforming workforce; however, as it is stated in "Workforce Development in Emerging Economies: Comparative Perspectives on Institutions, Praxis, and Policies":

"emerging economies have invested heavily in education in the last few decades and by 2010 the gross enrollment ratio for primary education in low-income countries had exceeded 100 percent; secondary education and tertiary education also expanded rapidly in both low and middle-income countries. The payoff from investments in education seems to depend critically on cognitive skills, which complement two other distinct skill sets – technical and social-emotional or soft skills – that also appear significant for economic productivity. The Skills Toward Employment and Productivity (STEP) framework identifies five broad areas for policies on skills to boost economic growth and productivity; the third area, building job-relevant skills, recognizes the role of vocationally oriented investments in building skills. Three conventional approaches include pre-employment vocational education and training (VET), workplace training, and training targeted to workers in the informal economy" (Tan, Lee, Flynn, Roseth, & Nam, 2018).

The value of knowledge is a part of daily life for members of emerging economies; until recently that knowledge just has not been that of developmental technologies. Knowledge of a softer nature, such as how to be happy with oneself, has always been an asset as shown by some emerging economies being consistently highly ranked in the happiness index despite their less-developed status (Canan, n.d.; Ahmed J., 2018). The same cannot be said for many developed nations (Patton, 2011). Taking the soft-skilled workers of developing nations and training them to be as equally technically skilled as their peers in developed nations can create a new generation of maximum-efficiency workers.

Additionally, during interviews with Access to Information (A2I)'s lead in Bangladesh, Mr. Anir Chowdhury, he coined a phenomenal term called the "Double EQ" of the organizational workforce. It essentially means "Emotional Quotient" and "Empathy Quotient". He is utilizing the Double EQ in various A2I programs to derive and position people in projects based on that parametric; thus leading to a more interested and therefore more productive workforce.

Bangladesh, just like most emerging countries, faces a mass exodus of highly educated students leaving the country for better opportunities and prospects (Hasnat, 2018).

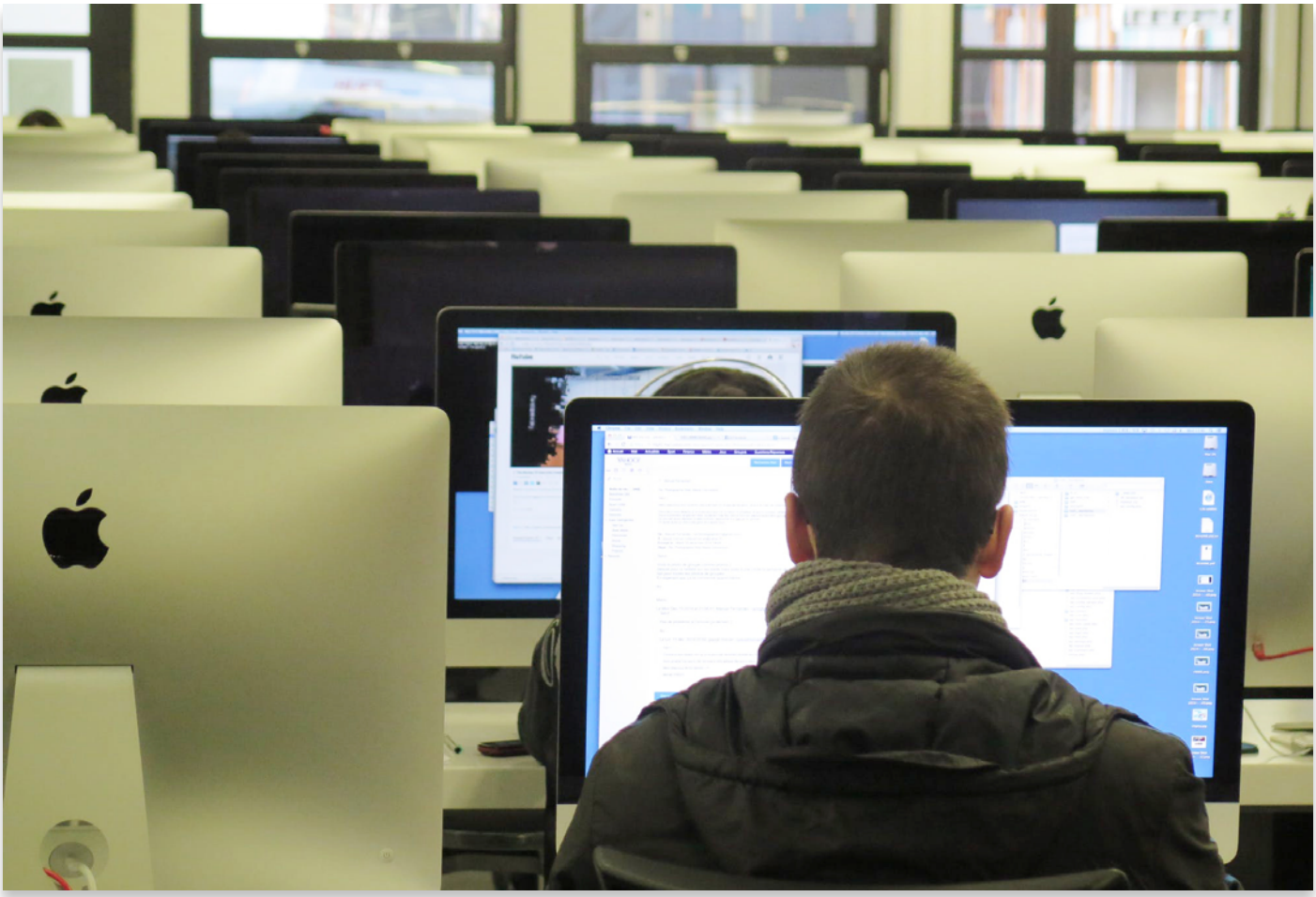
YEAR	STUDENTS GOING ABROAD
1999	7,169
2000	7,908
2001	9,416
2002	11,575
2003	15,380
2004	14,487
2005	14,420
2006	14,524
2007	15,756
2008	16,607
2009	19,344
2010	21,736
2011	22,725
2012	22,827
2013	22,779
2014	28,884
2015	33,139
2016	33,139
	Source: Unesco

Figure 9. The amount of students leaving Bangladesh each year to receive a foregin education (Opu, 2018).

The number of students leaving Bangladesh for foreign education has more than quadrupled between 1999 and 2016. Furthermore, like in many emerging economies, its current education system does not address the key opportunities and challenges of the future nor the economy's local necessities. A Centre for Policy Dialogue report suggests, approximately 500,000 foreign workers are employed in Bangladesh and remitting nearly five billion US dollars every year (Opu, 2018).

Steps can be taken in economies such as these to reach what is known as a "Knowledge-Market-Fit". In summary, those steps are to absorb local talents and build capabilities to create more opportunities, then evaluate core strengths and capitalize on creating new forms of services facilitated by skilled workforces, and finally prepare for global changes in job losses and reposition current workforces.

Although the initiatives and progress made in emerging countries have pushed them in the direction they need to go, it is likely that further analysis at its core will unravel new opportunities to transform human capital.



Blockchain in the Context of Transformational Economies:

Blockchain's Utilization

Blockchain is described as a distributed technology that allows data storage, transferring, and record keeping in cryptographically secured processes that adhere to protocols that leverage the network. In layman, it is a whitepaper created, maintained, and used by billions of people worldwide. Through blockchain we can transfer value, identify and record occurrences, and share data with appropriate personnel to ensure transparency. Blockchain at its core solves some of the existing issues in transformational economies. Issues such as:

1. Establishing identity
1. Relieving the need for intermediaries
1. Building trust and transparency in systems
1. Securing information, value, and systems
1. Reducing deployment and maintenance in operating systems and processes
1. Accessing global resources to build use case applications

Hence, blockchain has the ability to resolve some of the most challenging problems facing emerging economies, some of its use cases include:

Agricultural Industry:

Blockchain-based agricultural solutions are enabling opportunities for farmer-focused risk pooling through platforms such as Ibisa and Ripe (Ripe.io, n.d.; Ibisa, n.d.). Moreover, Ambrosus is bringing visibility to the food supply chain; AgriDigital is bringing commodity management to the grain industry and projects like EthicHub and Lokaal are bringing about new forms of financial services for farmers in the form of microloans and crowdfunding (Ambrosus, n.d.; Agridigital, n.d.; EthicHub, n.d.; Lokaal, n.d.). In summary, all these platforms are resolving issues such as financial liquidity, risks in the agricultural sector, ensuring safety, providing transparency in the supply chain, and providing discouraged farmers with added value.

Infrastructure, Urban, and Technological Development Industry:

Blockchain-based infrastructure and urban city solutions have enabled the monitoring and distributions of utilities through projects such as L03 Energy (L03 Energy, n.d.). Other projects such as Omnitude are partnering with the government of Malta to create

blockchain infrastructures for public transit management and similarly, projects such as Waltonchain are combining blockchain and IoT for smart city management in areas such as city waste, water, and building management (Omnitude, n.d.; Waltonchain, n.d.).

There is also an area of widely open-sourced and inexpensive technology systems in the blockchain space. These open source protocols are allowing people from emerging economies to access a globally distributed database and with its own resources. Through customized developments, emerging countries will have the capacity to build technological capabilities previously only accessible to high-end research labs, most of which are in Silicon Valley. Projects such as IPFS (Inter-Planetary-File System), which is developing a universal data storage system independent from cloud-based systems and physical data storage infrastructures (Ipfs, n.d.).

Additionally, projects such as Blockstack are creating a new internet, registering over 27,000 domains in its preliminary phase (Blockstack, n.d.). Then there are projects such as Hypernet which work to enable new and efficient forms of connectivity and Ethereum which allow applications to execute digital contracts in the way of “Smart Contracts” (Hypernet, n.d.; Ethereum, n.d.).

These are just a few of the many projects geared towards making blockchain technology a part of day-to-day life. Some may say this about the relationship between blockchain technology and legacy computer technology: it is similar to the emergence of alternating and direct currents; the latter may have appeared first but it was not sustainable in the long-run.

Governance, Finance, and Commerce Industry:

There are several blockchain projects in this space that are either reinventing existing models or creating new models to address various needs. The projects are enabling governments to: nationally manage identity, collect taxes, and monitor internal voting and revenue data. Some projects such as Civic are creating self-sovereign and secure identity solutions and Decode is an EU project that empowers citizens to exercise control over their data (Civic, n.d.; Decode, n.d.). Bitfury-NAPR, which is one of the world's first blockchain-based government projects, specializes in land-title registration in the Republic of Georgia (Pipan, 2016).

Additionally, there are projects like BlockApps which develop enterprise-grade systems for businesses to bring transparency in the traditional supply chain industry (BlockApps, n.d.). Then there are projects such as Ripple that work to build globally efficient back-end banking infrastructures such as payment rails to minimize costs, maximize security, and increase speed (Ripple, n.d.). Some even go so far as to create whole new protocols for cross-border payments by utilizing digital-crypto currencies and fiat currencies: such as Stellar (Stellar, n.d.). The government, finance, and commerce ecosystem is buzzing with new developments and has been the new space of many blockchain specific use cases.

Education and Workforce Industry:

This particular area will have especially critical implications in emerging economies. According to my research, there are nearly 5,000 credible blockchain developers in the world. Considering blockchain's likely growth in upcoming years, the current number of developers will not meet the coming demand; emerging economies could be the key source of the IT outsourcing industry if citizens are properly educated. Furthermore, given the necessity to localize various Blockchain specific projects, proper education would also provide skills for the internal market.

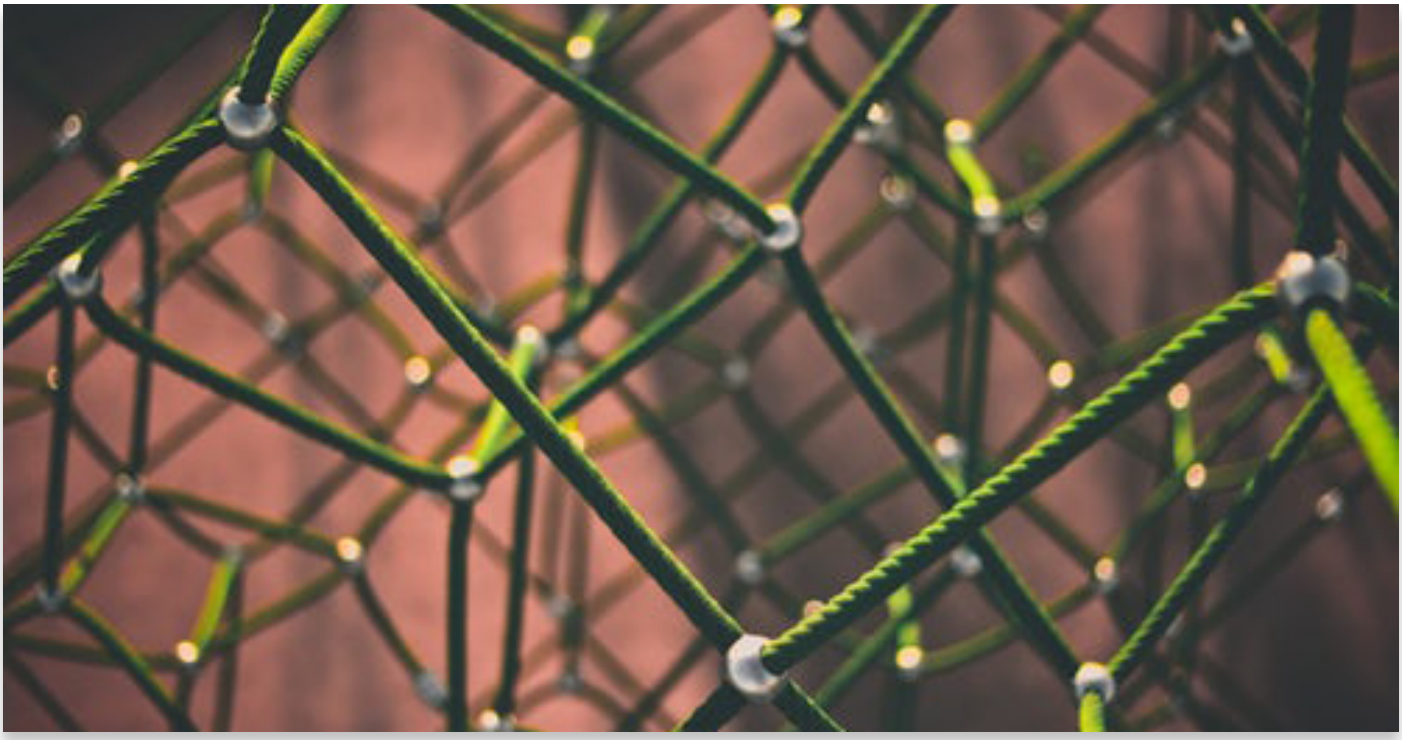
Additionally, there are potential implications of decentralizing education, its assets, and even digitizing and skill matching credentials. Student led organizations such as "Blockchain At Berkeley" are enabling blockchain-specific learning for all and MIT has been a pioneer for digitizing student credentials on the blockchain by creating an open source standard (Blockchain at Berkley, n.d.; Schmidt, 2015).

As a final example, San Jose State University is building a project called "Library 2.0", which would ultimately be a globally distributed educational contents and knowledge bank (Hargadon, n.d.). At present, there are new projects being developed around creating blockchain-based virtual ecosystem for schools, including decentralized classrooms and financing students in applying their skill sets to several projects. Blockchain-influenced education will be unlike the education of today and its benefits will be experienced by people in both developed and developing countries.

As seen across the blockchain space, the technology's impact will be substantial and potentially lead to the emergence of new economic powers with the utilization of technology and opportunities presented. These "Transformational Economies" should be identified as those that have underlying challenges in the industries previously listed (Agriculture, Infrastructure, Governance, etc) and who's challenges may be resolved through changes aided by emerging technology to the point where they can capture over 50% of the projected market in that industry. As the definition suggests, we do not believe transformational economies will struggle to "emerge" themselves into the markets of more developed nations; instead, we believe they are capable of dominating the global market entirely.

Conclusion

Technology will play a significant role in shaping the future of transformational economies, and blockchain will play a critical part in that success story. Blockchain technology is the next steam-engine and it will enable transformational economies to become giants. Technology is not “evil” by nature; its usage pattern determines where it will reside. Blockchain's birth may be associated with Bitcoin, created to move untraceable money, but it was also a resolve from the many problems of the financial industry as well as the financial crisis that led to its birth (Bitcoin, n.d.). Furthermore, let us not forget the problems blockchain has the potential to eradicate the lack of trust-transparency-accountability in current systems, governance, and processes for one. The time of corrupt individuals taking advantage of existing flaws within the current systems and thus undermining current infrastructures is coming to an end. In my opinion, blockchain technology, if correctly utilized, has the potential to provide society with long-term sustainability and a global blockchain market capable of generating 3.1 trillion US dollars of business value by 2030.



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