Exploring the links between finance, technology and growth in Kenya

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Creating value through inclusive finance
Exploring the links between finance, technology & growth in Kenya

The Kenya Financial Sector Deepening (FSD) programme was established by the UK’s Department for International Development (DFID) programme in 2001 to support the development of financial markets in Kenya. In 2005 we were constituted as an independent trust under the supervision of professional trustees, KPMG Kenya, with policy guidance from a Programme Investment Committee (PIC). Our aim today is to help realise a vision of an inclusive financial system to support Kenya’s goals for economic and social transformation. We work closely with government, financial services industry and other partners across key economic and social sectors. The core development partners in FSD Kenya are currently the Bill and Melinda Gates Foundation and the Swedish International Development Agency (SIDA).
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Chapter 1
Introduction

Starting with microcredit in the late 1980s, there has been a growing movement of multilateral institutions, private foundations, non-profits, corporations and governments that aims to provide formal financial services to low-income market segments around the world. This movement is largely motivated by the conviction that access to financial services reduces poverty.

Libra, Facebook’s new digital currency\(^1\), for example is being launched in the name of connecting people who do not have access to traditional banking platforms, citing in its promotional video that access to digital financial services can reduce poverty by 22 percent.

Over time, the focus of this movement has shifted from microcredit towards encouraging access to a wider, more comprehensive range of financial services, including savings, payments and insurance. There is also a growing emphasis on digital finance – the use of modern information and communication technologies (ICT) to help improve the quality and convenience of financial services, while lowering the cost of acquiring and servicing often isolated customers whose income streams support only relatively small or infrequent transactions.

Kenya has become both a posterchild and focal point of this movement. In 2008, as financial innovation was derided in the US and Europe for its role in the global financial crisis, Kenya’s most famous financial innovation, M-Pesa, was celebrated globally and hit a milestone of reaching 5 million subscribers in just 2 years\(^2\). M-Pesa is now widely recognized as a major success story\(^3\) both because of its explosive adoption by people without a bank account and the evidence it has delivered tangible economic benefits to Kenya’s poor, primarily by enhancing the ability of households to cope with adverse shocks through their social networks and to escape poverty (Suri & Jack, 2012:2016).

Today, mobile money is a key pillar of Kenya’s financial infrastructure and is central to commerce, household finance and innovation: In 2018, 1.6 billion payments (totalling USD 39 billion) were made by the nearly 20 million adults (79 percent of 18+ population) who use a mobile money account. The next most important non-cash payments instrument by volume were debit or credit cards (92 million payments totalling USD 4.2 billion in 2018)\(^4\).

Largely as a result of mobile money and later banking services offered on mobile phones through partnerships with mobile money operators, the share of Kenya’s adult (18+) population using either an account from a formal financial institution\(^5\) or a mobile money wallet grew from 27 percent in 2006 to 83 percent in 2018 at an astonishing rate of over 9.4 percent per year (FinAccess, 2019). The consumer-base for formal financial services has broadened in parallel with the rapid expansion of the value-added output of the financial and ICT service sectors which, over the same period, grew by 7.4 and 10.9 percent per year respectively. And as a share of GDP, banking system deposits increased from 30 to 44 percent between 2000 and 2016 (Global Financial Development Database, 2018).

While there is a growing body evidence on the individual or household-level impacts of the adoption of specific financial products by low income population segments

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4. In addition, 18.3 million payments (totalling USD 25.6 billion) were made with a cheque and 13.5 million payments were made via EFT (totalling USD 6.6 billion). Source: Central Bank of Kenya, National Payments System data: https://www.centralbank.go.ke/national-payments-system/
5. Commercial bank, Savings and Credit Cooperative (SACCO) or Microfinance Institution (MFI).
in Kenya—what is less clear are the wider economywide spill-over effects generated by the activity of a larger financial sector, rapid financial innovation and greater financial inclusion, in particular the effects on labour productivity and sustained long-run growth. As Timothy Ogden argues “the purpose of a financial system is to create spillover effects” and “impact evaluations do not necessarily tell you anything about the value of the [financial] system”7. While poverty reduction is often cited as the key goal of financial inclusion investments, sustained economic growth isn’t often explicitly mentioned as a means to that end, although a key finding of development research is that growth is one of the most effective ways to pull people out of poverty (Ferreira and Ravallion, 2008)8.

Growth and poverty trends in Kenya are largely positive: Average annual GDP growth accelerated from 4.2 percent in 2000-2009 to 5.4 percent in 2010-2017 and Kenya’s national poverty rate declined by about 1 percent per year (from 47 to 36 percent) between 2005 and 2015 (KNBS, 2018a) resulting almost entirely from rising consumption among the poorest rural households which are diversifying into informal service-sector activities such as wholesale and retail trade and transportation. Meanwhile, modern services in technology, telecoms and finance have been strong performers, driving innovation and attracting high skilled workers and wider investment to Nairobi. In addition to creating good jobs that in turn create the demand for services and jobs in other sectors (such as construction for housing and office space, restaurants, hospitality as well as legal and business services), the growth in the technology and skill intensive ICT and financial sectors are deepening the country’s capabilities in software development, data science and related computing technologies which could theoretically position it to take advantage of adjacent fields like artificial intelligence and robotics in the future.

At the same time, the economic circumstances of millions of Kenyans have not fundamentally changed. Modern production technologies in agriculture are not diffusing widely and food prices more than doubled between 2005 and 2015, squeezing the incomes of both urban and rural families alike, perhaps helping to fuel the growing demand for short-term digital loans that are primarily used for “day-to-day consumption”9.

Lending to the private sector, a measure linked to the financial system’s ability to “research firms, exert corporate control, provide risk management services, mobilize savings and facilitate transactions” (Levine, 2005) increased only modestly from 26 to 33 percent between 2005 and 2016. Caps on commercial lending rates passed into law in 2016 curtailed already relatively low levels of lending to small and medium enterprises (SMEs), dampening the ability of private sector lending to fuel growth. While involving over 60 percent of Kenya’s workers and accounting for 25 percent of GDP, the agricultural sector received less than 4 percent of commercial bank lending in 2017. Further, little dynamism among manufacturing and service sector firms contributes to low rates of formal job creation relative to Kenya’s burgeoning labour force: an estimated 87 percent of new jobs are informal, offering few protections, limited financial stability and limited growth potential (KNBS, 2018b).

Finally, Kenya’s manufacturing sector has not been a strong source of structural transformation: as a share of GDP, manufacturing output has remained at under 10 percent since independence in 1963 and the share of total wage employment in manufacturing fell from 13 to 11 percent between 2000 and 2017 (KNBS, 2001, 2009, 2018b)10.

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6. For an overview of the global evidence, see for example Karlan et al (2016) and the “Evidence Gap Map” by the Partnership for Finance in Digital Africa for an up-to-date listing of studies looking at the impact of digital financial services (https://www.financedigitalafrica.org/evidence-gap-map/). In Kenya, Dupas and Robinson (2013a and 2013b) and Habyarimana (2018) among others, have looked at the impact of savings products, Suri et al (2012,2016) have looked at the impact of M-PESA and Bharadwaj et al (2019) have looked at the impact of digital credit (M-Shwari). The studied impacts are generally large and positive with respect to savings and person to person payments and small for digital credit.

7. CGAP blog “Learning from financial inclusion research: What should we expect?” https://www.cgap.org/blog/learning-financial-inclusion-research-what-should-we-expect

8. More specifically, on average, economies that grow faster reduce absolute poverty much more rapidly. But as Ferreira et al argue, this does not mean inequality can be ignored. Empirically, growth is less effective at reducing poverty when inequality is high, and if inequality rises with growth, it further brakes growth’s influence on poverty reduction. Secondly there are reasons high inequality can reduce the rate of future economic growth and thirdly, inequality in itself may be ethically objectionable in its own right.

9. Between 2015 and 2019, the percentage of the adult population that reported to be currently using digital credit increased from 6 to 15 percent of the population (FSD Kenya, 2019).

10. The limitation of these employment-shares is that they only consider wage employment data from formal establishments, thus excluding the large informal sector. The Groningen Growth and Development (GGDC) 10-sector database provides total employment (persons-engaged) shares by sector derived from labour-force surveys and census data. The GGDC database estimates the share of the total population engaged in manufacturing at 3.6 percent in 1969, 4.2 percent in 1985, 10 percent in 2000 and 12.7 percent in 2011.
How do we understand the role of Kenya’s financial system in these macroeconomic dynamics and outcomes? Has a focus on access to accounts and the direct, short-term impact of financial services on households crowded out attention on financial sector development more broadly and its potential to boost productivity, long-run growth and the welfare of future generations? As Kenya’s increasingly large, innovative and profitable financial system has included within its reach ever larger segments of the population, has it also supported the ability of individuals to invest in production and human capital? Has it improved its capabilities to identify - and allocate capital to - promising small or medium sized firms to support their ability to acquire and scale production technologies and organizational capabilities so that they can compete in the domestic market or seek out export markets and grow and employ more people?

In addition to creating mobile financial services that are suited to an economic context that offers only very narrow pathways to upward mobility, is it doing enough to change that context? Or are the wider benefits of Kenya’s digital financial infrastructure yet to truly materialize, with its long-run growth impacts conditional on the specifics of how Kenya builds on- and interconnects - the key components of that foundation: cellular networks, mobile phones, the internet, agent networks, mobile money and financial intermediaries, to solve concrete problems with tailored products for different people or businesses in different ways?

These big-picture questions are particularly important as Kenya’s Vision 2030 plan “aims to transform Kenya into a newly industrializing, middle-income country” by 2030. To achieve this vision Kenya will need to raise its GNI per capita from around USD 1,460 today to USD 3,895 in 2030, requiring an average growth rate of 7.8 percent per year, more than triple what it was between 2000 and 2017. In the short-run, the country’s policy efforts are focused on achieving the pillars of its “Big Four” economic agenda: universal healthcare, food security, manufacturing and affordable housing. To give an example of the level of ambition embedded in the plan’s targets, Kenya aims to increase the share of manufacturing in the economy from 9 percent of GDP in 2017 to 20 percent in 2022.

There seem to be blind spots in the current program of advocacy, research and investment occurring under the financial inclusion umbrella that prevent more concrete guidance to the needs of policymakers that are grappling with achieving and implementing ambitious development programs like Kenya’s. Specifically, what policies and investments in the development of Kenya’s financial system are likely to raise labour productivity and long-run economic growth while maintaining stability?

Rather than resolve these questions, they are raised here mostly to frame and motivate a discussion that interrogates the links between Kenya’s financial sector and the acquisition and diffusion of production capabilities that underpin productive jobs and long-run economic growth, with the ultimate goal to help identify how those links can be strengthened. This paper is not an exhaustive interrogation of all drivers of long-run economic growth and their interactions – such as the legacy of colonialism, political institutions and governance, human capital and the environment – nor does it examine all development outcomes that are worth pursuing in their own right – such as health, education, liberty, freedom from violence and gender equality. The focus here is narrow: the key outcome against which the role of finance is evaluated is sustained economic growth and the standard of living improvements that ensue when the productivity of an economy and the income of workers grows.

This paper proceeds as follows. It first surveys theories of economic growth and describes different facets of Kenya’s own recent growth experience, economic complexity and technology landscape using publicly available data and contrasts Kenya’s experience with of a group of comparison countries. Secondly, it examines the theoretical and empirical links between the financial sector, technological change and growth; provides an overview of key development in Kenya’s financial system and tries to unpack how those developments connect to the growth trajectory described in the first section.

11. These are dimensions of well-being that are not well represented in measures of aggregate economic production, such as GDP. See for example the “Report by the Commission on the Measurement of Economic Performance and Social Progress” for a technical discussion of these issues.
Evidence of the links between finance, technology & growth in Kenya

Chapter 2
Perspectives on economic growth

2.1 Theory

Kenyans have an average living standard today that is about one twentieth of the one enjoyed by Americans (average income per person adjusted for differences in prices is USD 3,285 in Kenya vs. USD 59,531 in the United States, Figure 1). 1855 was the year in which Americans had an estimated living standard equivalent to the one Kenyans have today (Maddison Project Database, 2018). As argued by Robert Gordon in his book “The rise and fall of American growth”, America’s growth story begins 15 years later, in 1870.

Figure 1: Measured in income purchasing power terms, Kenya’s average material living standard today is similar to the US’s in the 1850s and China’s in the early 1990s.

Real GDP per capita, Kenya, China & the US
2011 PPP USD

Source: Maddison Project Database, version 2018. Notes: GDP per capita is on a logarithmic scale.

Gordon designates the next 100 years a “special century” for the United States (US), one that brought about an economic revolution that:

“...freed households from an unremitting daily grind of painful manual labor, household drudgery, darkness, isolation, and early death. Only one hundred years later, daily life changed beyond recognition. Manual outdoor jobs were replaced by work in air-conditioned environments, housework was increasingly performed by electric appliances, darkness was replaced by light, and isolation was replaced not just by travel, but also by color television images bringing the world into the living room. Most important, a newborn infant could expect to live not to age forty-five, but to age seventy-two.”

Driving these transformational changes in material welfare were the ideas and inventions that put the US at the cutting-edge of technology and growth. Between
1870 and 1970, the invention and adoption of electricity, the internal combustion engine, public waterworks, modern communication, anaesthetics, antibiotics and other chemicals and pharmaceuticals, transformed how things got made and how people’s daily lives unfolded. In other words, ideas and innovation were paramount to US growth.

With its more recent economic transformation and growing presence in Kenya, China is perhaps an even more salient example for Kenya. Like other East Asian countries in the latter half of the 20th century, China grew through rapid export-oriented industrialization characterized by the transition of labour from low productivity agriculture to modern manufacturing industry (X. Diao et al, 2019). China’s economic growth was accelerated by a program of economic reforms in 1978 that encouraged the emergence of market mechanisms such as the formation of private enterprise and the liberalization of foreign trade and investment. Such has been the success of these reforms, that the 2019 Fortune Global 500 list includes more Chinese (129) than US companies (121), including home-grown tech companies that are now global brands: Alibaba, JD.com, Tencent (WeChat) and Huawei. At the time of China’s reforms in 1978, China’s average purchasing power per person was nearly USD 1,000 lower than Kenya’s (Figure 1), by 1990 average living standards had nearly equalized at around USD 2,500 and in 2016, the average Chinese has roughly USD 9,500 more in real purchasing power than the average Kenyan. And importantly these gains were pro-poor, between 1990 and 2005, China’s absolute poverty rate fell from 66 to 0.7 percent (World Bank, World Development Indicators database).

If the US’s journey in broadly raising living standards was a marathon, China’s has been a sprint. During the US’s ‘special century’, average living standards improved by around 1.7 percent per year. In the past 50 years, China’s average living standards grew at 5.1 percent per year. Since its independence in 1963, Kenya’s real purchasing power per person grew at an average rate of 0.67 percent per year. Even with a growth acceleration starting in the early 2000s, Kenya’s slow and for long periods – stagnant – pace of growth means that many people’s daily lives are shaped by hardship in ways that resemble life in the US in 1870. For example, in 2016, 40 percent of adults reported farming or working as farm day-labourers as their primary income source (FinAccess, 2016) and 54 percent of household consumption was for food (KIHBS, 2015). In 2018, 1 in 4 households use firewood, paraffin or grass as a source of lighting, nearly 4 in 5 households used firewood, grass or other biomass, charcoal or paraffin for cooking, about 1 in 3 households collect water from rainfall, rivers, lakes or unprotected springs and nearly 2 in 3 households use unimproved pit latrines for toilet needs (FinAccess, 2019).

In one domain, however, a large majority of Kenyans use a frontier technology which has opened up new possibilities. Over three in four adults own a mobile phone, giving them the capability to communicate - and with the innovation of mobile money, to transfer funds - instantly and affordably. For investors and

12. It is critical to note of course that material progress over this period was not evenly distributed and while the US civil war ended slavery in 1865, the struggle to extend the basic rights enshrined in the constitution to blacks, women and other minorities continued well through the 20th century. The legacy of discrimination by race and gender continues to negatively impact blacks and women, most evident in the distortions of the criminal justice system that lead to high incarceration rates, uneven access to opportunities leading to large wage gaps, and the absence of policies – such as paid parental leave – that would reduce the economic burden of child-rearing for women and families.


14. During most of the 1980s and 1990s, average living standards in Kenya did not progress. During this time several factors suppressed Kenya’s economic potential, including the erosion of political freedoms and climate of fear under President Daniel arap Moi, structural adjustment programs initiated by the World Bank and IMF lead to reductions of government spending on health and education and the HIV/AIDS epidemic became one of the major causes of illness in the mid 1990s (In 1996, 10.5% of Kenyans were living with HIV/AIDS).

15. In 1870, the share of adults in the United States 10 years and older in agriculture was 53 percent (https://www2.census.gov/library/publications/1994/compendia/hist_stats/1789-1945/hist_stats_1789-1945-ch1.pdf), and in 1900 the share of total household spending on food was around 45% (see “100 years of consumer spending” from the U.S. Bureau of Labor Statistics).

16. Fees associated with M-Pesa usage are triggered with withdrawal (cash-out) and transfer transactions. Transfers to other M-Pesa users is free below KSh 100, but these transactions are capped at 3 per day. In FSD Kenya’s Financial diaries study of the financial lives of 300 low income households across Kenya, the average size of M-Pesa transfers sent was KSh 833 (USD 8.08) which today would incur a KSh 15 (USD 0.15) fee - or 1.8 percent of the transaction value. The average size of cash-out withdrawals was KSh 935 (USD 9.07), which today would incur a KSh 28 (USD 0.27) fee - or 2.9 percent of the transaction value.
dualism is the re-allocation of near ‘unlimited’ labour productivity in an economy characterized by structural sector stagnates from a technological perspective. By extension one of the key channels for growth and (1954) in which innovation and productivity growth are concept	of	structural	dualism	first	advanced	by	Lewis trade	and	“jua	kali”	sector	ton	the	other,	reflects	the agricultural and a large informal wholesale and retail and growth of ICT and fintech on one hand and traditional economic landscape made salient by the emergence of a middle class 21, developing and sustaining a technology hub19 that has attracted some of the world’s biggest tech companies, such as Google, IBM and Uber. But perhaps no better illustration of this changing technological landscape is local telecoms giant Safaricom. With a market capitalization of USD 20.5 billion that makes it the most highly valued company on the Nairobi Securities Exchange, Safaricom’s valuation derives directly from its ability to leverage cutting edge communications technologies and infrastructure in offering services to customers.

Technology has also benefitted Kenyans in ways that aren’t captured fully in GDP. For example, between 1960 and 2017, with the aid of basic health technologies like bed-nets and antibiotics and more modern ones (like antiretroviral drugs20), under-5 mortality fell from 197 to 46 deaths per 1,000 live births, driving an increase in life expectancy at birth from 46 to 67.3 years, placing it far above the Sub-Saharan Africa average of 56.9 years and close to the lower-middle income average of 67.9 years (World Bank, World Development Indicators database).

The sharp contrasts in technology in the Kenyan economic landscape made salient by the emergence and growth of ICT and fintech on one hand and traditional agricultural and a large informal wholesale and retail trade and “jua kali” sector on the other, reflects the concept of structural dualism first advanced by Lewis (1954) in which innovation and productivity growth are concentrated in the modern sector while the traditional sector stagnates from a technological perspective. By extension one of the key channels for growth and productivity in an economy characterized by structural dualism is the re-allocation of near ‘unlimited’ labour in the traditional sector to a modern sector with high productivity. In Africa, labour productivity gaps are enormous across sectors. In 2010, labour productivity in the agricultural sector in eleven African countries (including Kenya) was two thirds lower than labour productivity the economy generally while labour in the most productive sector - mining - was nearly 17 times higher (Diao et al, 2019).

Historically, labour-intensive manufacturing industries (factory jobs) had the ability to absorb large numbers of unskilled workers. In the United States, for example as the share of total employment in manufacturing rose from less than 10 percent in 1850 to near 30 percent in 1950, the share of total employment in agriculture fell to from 60 to 20 percent (McKinsey Global Institute, 2017). Due to the historical role of manufacturing jobs in growth, poverty reduction and the emergence of a middle class 21, developing and sustaining a manufacturing sector continues to be understood by policymakers as a key pathway for development. This is evident in Kenya’s Vision 2030 plan as well as wider regional initiatives such as the African Continental Free Trade Area (AfCFTA) that aim to boost manufacturing on the continent.

However, it is unclear to what degree a manufacturing led growth process can be the primary engine for poverty reduction for today’s low-income countries. Dani Rodrik and others have documented a phenomenon known as “premature deindustrialization” where developing countries (mostly outside of Asia) have experienced declining shares of both output and employment in manufacturing since the 1980s. The explanation offered by Rodrik is that trade and globalization have adversely affected nascent manufacturing sectors in developing countries through a “doubly whammy”. First, countries

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17. The average number of years of education that a child in Kenya can expect to attain by her 18th birthday is 10.7, not far behind the global average of 11.2 and substantially above the Sub-Saharan African (SSA) average of 8.1. Kenyan students also outperform the global- and SSA regional- average on international learning assessments (World Bank, Human Capital Project).
18. The East African Marine Systems (TEAMS) undersea fibre optic cable underpins access to affordable and reliable broadband at average speeds faster than those in the US.
19. Kenya is home to a vibrant technology and innovation scene, informally known as “Silicon Savannah” and home to over 200 startups and numerous tech-hubs, most famously the iHub.
20. Between 1996 and 2018, HIV/AIDS prevalence fell from 10.5% to 5.9% largely due to the rapid scaling up of HIV/AIDS treatment and care. In 2016, 64% of people living with HIV/AIDS were on treatment. See: https://www.avert.org/professionals/hiv-around-world/sub-saharan-africa/kenya
21. Manufacturing jobs tend to more productive and become more productive over time. Since manufactured goods are easier to send abroad than person to person services, manufacturing jobs are also associated with exports, and in democratic societies, a manufacturing sector can also create corporate interest groups that lobby for government to invest in infrastructure and human capital which helps boost economic growth more generally (Tyler Cowen on Premature Industrialization from Marginal Revolution University: https://mru.org/courses/development-economics/premature-deindustrialization).
that opened up their economies to trade became net importers of manufactured goods and second, the decline in the prices of manufactured goods in advanced economies made it economically more difficult for manufacturers to survive (Rodrik, 2015). Rodrik argues that the prospects of industrialization as a development strategy for today’s lower income countries in this setting looks increasingly bleak since two avenues for productivity growth are blocked: First, the productivity gains that occur when workers from the countryside move to urban factories where they are more productive and second the productivity gains that occur in the medium to long run as manufacturing firms themselves become more productive. And even if manufacturing can expand, the nature of production for many goods today involves the use of robots and automation that have replaced tasks that human workers used to do, which makes it less likely that the manufacturing sector alone will be able to absorb the volumes of labor it once did. Across developing countries, the percentage of jobs in manufacturing averages near 18 percent, far below the historical peaks seen in now industrialized countries. If this trend holds, the growth challenge today for many countries is fundamentally different. In a passage particularly relevant for Kenya, Rodrik summarizes this challenge as follows:

“In the absence of sizable manufacturing industries, these economies will need to discover new growth models. One possibility is services-led growth. Many services, such as IT and finance, are high productivity and tradable, and could play the escalator role that manufacturing has traditionally played. However, these service industries are typically highly skill-intensive, and do not have the capacity to absorb – as manufacturing did – the type of labor that low- and middle- income economies have in abundance. The bulk of other services suffer from two shortcomings. Either they are technologically not very dynamic. Or they are non-tradable, which means that their ability to expand rapidly is constrained by incomes (and hence productivity) in the rest of the economy.” (Rodrik, 2015)

If structural dualism emphasizes the growth process that ensues as workers transition from traditional to modern sectors, neoclassical models of growth emphasize the growth process that ensues through savings and the accumulation of physical and human capital within the modern sector (X. Diao et al, 2019). The earliest neoclassical growth models explained the dynamics of growth in terms of the high initial returns that would accrue to poorer countries investing in factors of production (such as machinery, factories and education to raise the skill-level of the workforce) and predicted convergence between countries. These models suggested that a country like Kenya would grow (and “catch-up” to rich countries) primarily by mobilizing resources from domestic and foreign savings towards investments in physical and human capital. Given a low capital stock (and abundant labour), additional capital investment would produce high returns, generating more output and the resources for additional investment until reaching a steady state where the country needed to use all of its investment resources to maintain or replace depreciated capital stock.

But despite improvements in the mobility of financial capital, goods and technology, absolute living standards in Kenya relative to the US and other high-income countries are diverging. From 1963 to 2016 the ratio of GDP per capita (PPP) between the US and Kenya rose from 12 to 17. Kenya is not unique in this regard. Over the long run, living standards between rich and poor nations have mostly diverged. Between 1820 and 1992, the ratio of average incomes between the richest and poorest fifth of countries rose from 6 to 70 (Easterly and Levine, 2001). In synthesizing the evidence from several growth accounting studies, Easterly and Levine (2001) conclude that “when comparing growth experiences across many countries, ‘something else’ – besides factor accumulation – plays a prominent role in explaining differences in economic performance”. That ‘something else’ is total factor productivity (TFP) or the part of output per person growth that is unexplained by growth in physical or human capital.

Clark and Feenstra (2001) expand on this and argue that diverging incomes across countries since 1800 are a result of divergence in the TFP of economies resulting from technology - not an inability to get

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22. TFP is essentially understood to be an efficiency factor that augments the productivity of factor inputs (capital and labour), however it is also recognized as “a measure of our ignorance”. Some researchers highlight generalized efficiencies such as those enabled by good management or externalities while others highlight factor specific efficiencies such as the poor performance of production workers in low wage countries. Others liken global TFP to the existing set of public knowledge goods and “know how” - or set of blueprints - that enables economic actors to transform inputs into valued outputs.
access to it - but differences in the efficiency in how new technologies are used. Bosworth and Collins (2003) show that between 1960 and 2000, TFP grew significantly more slowly in three developing country regions (Latin America, the Africa and the Middle East) than in industrial countries between 1960 and 2000. More recently, Comin and Mestieri (2017) explore whether the dynamics of technology can account for the long run divergence in incomes between countries and look specifically at the relative contribution of the rate at which new technologies arrive in a country and the rate at which technologies diffuse throughout the economy. The authors find that while technology adoption rates are converging (it takes less time today for new technologies to arrive in countries than they did 200 years ago), technology penetration rates have diverged and that these patterns of technology adoption and diffusion account for the majority of cross-country evolution of income growth.

It is important to recognize, however, that factor accumulation is not irrelevant for growth everywhere and at all times. Available evidence suggests that factor accumulation, particularly physical capital, played a greater role than TFP in driving the more rapid rates of growth in South and East Asia relative to the industrial countries since 1960 (Pritchett 2017). A study by the IMF of the drivers of China’s growth prior to and after its program of economic reforms between 1953 and 1994, found that capital accumulation (for example new factories, manufacturing machinery, infrastructure) played a substantial but diminishing role in driving economic growth. Physical capital growth accounted for 65 percent of pre-1978 growth but that share fell to 33 percent of growth in the early 1990s. With TFP increasing by an annual rate of 3.9 percent between 1979 and 1994, productivity came to account for 50 percent of growth in the early 1990s (Hu and Khan, 1997).

Other lines of inquiry build on the observation that new businesses in the US grow substantially over their life course (through investment in technology, developing new markets or producing higher quality products) relative to other countries. Hsieh and Klenow (2005) explore how differences between aggregate TFP relate to the life cycle of manufacturing plants in India and Mexico compared to the United States. Strikingly, while employment in US plants grows eight-fold over the span of 40 years, Indian plants remain the same size and Mexican plants are only twice their initial size. These observations suggest the existence of factors - such as high taxes, labour costs, financial constraints or transportation and trade costs that constrain access to markets - which in some combination disincentivize organizational capital investment in India and Mexico. The authors explore a chain-reaction of mechanisms that can suppress overall TFP: If new entrants fail to invest, the plants will be less productive as they age. These incumbents in turn, will not effectively deter market entry, encouraging greater flow of entrants thereby reducing average establishment age and size. The authors find that low employment growth in Mexican and Indian plants is largely due to low productivity growth with age, and that aggregate TFP in the US would fall by around 25 percent if firms in the US moved to the Indian or Mexican life cycle.

If how firms and workers organize around production technologies is critical for firm performance and economic growth, Kremer (1993) explores how the interaction of workers with different skill levels in an “O-ring” production setting can influence the process of economic development more generally. Like the production of microchips, an O-ring production setting requires that workers complete a number of tasks sequentially and flawlessly. Like the weak link of a chain, failure by any worker in any of the steps reduces the value (quality) of the entire chain to zero. One of the implications of this model is that even if two firms (or countries) employ the same production technology, small differences in the skill levels of workers can result in very large differences in productivity and income.

Ricardo Hausmann’s work on complexity economics provides a related take on the dynamics of growth. Like others, Hausman attributes differences between rich and poor countries to technology but differentiates technology into tools (such as a mobile phone), codifiable knowledge (such as the computer program that runs the mobile phone’s operating system) and know-how (the tacit knowledge that cannot be easily written down). He argues that while tools and code are

23. An O-ring is a mechanical seal which fills the space between two adjoining surfaces. The O-ring reference in Kremer (2003) relates to the O-ring failure that lead to the explosion of the Challenger space shuttle.
quick to move, know-how isn’t and conceptualizes the process of development and growth as the process of incrementally accumulating more know-how and expressing it through production of a more diverse and complex set of products:

“In the economic growth process, countries in the developing world do not grow by making more of the same. In fact, more of the same is not the way rich countries grow either. In the process of economic growth, countries change what they do. They change what they’re good at. They evolve their comparative advantage. So while Israel used to export oranges, now they export IPOs of high-tech firms. Turkey used to export olive oil. Now they export cars and electronics. They do this because they acquire new productive capabilities; they acquire know-how and technology that allows them to do more diverse and valuable things. Some industries are better stepping-stones than other industries for this process. So if a country is good at producing tea or at oil extraction, these industries don’t naturally prepare it for the next thing. But there’s a much more parsimonious path if you’re moving from garments, to textiles, to toys, to electronics, and to cars, because each new industry can build on the capabilities that were acquired for the previous industry.” (Hausmann, 2015).

These lines of research suggest that a key factor in long run growth is the ability of countries to embed and widely diffuse technologies and know-how in their economies and use those technologies to expand their productive capabilities. In the context of a country like Kenya which is characterized by the coexistence of large low-productivity sectors with a rapidly emerging (but small) high productivity modern sector, older structural growth models are still relevant and suggest that if incentives to invest in nascent modern sectors supports their expansion, than labour from the traditional sectors can migrate to more productive jobs, diversifying and changing the structure of the economy in the process. However, in episodes of sustained growth, evidence suggests that the importance of structural change as a driver of growth diminishes and productivity growth within sectors through innovation and technology change becomes increasingly important (Diao et al., 2018).

It follows that to understand the historic and potential role of the financial sector in the long run productivity and growth of Kenya’s economy requires understanding (1) the degree of structural transformation: to what extent has labor moved from low productivity to high productivity activities? (2) patterns of technology adoption and diffusion in Kenya: what technologies have changed the economic possibilities for households, businesses and entire sectors? and (3) the links between finance and the process of structural transformation and innovation. Has the financial sector enabled or hindered the aggregate acquisition of know-how and production capabilities in the past? How might the financial sector support the creation of new production capabilities among different sectors of the economy in the future? A further line of inquiry has to do with the distributional impacts of Kenya’s growth dynamics: are they creating economic opportunities for the majority of Kenyans with livelihoods characterized by either poverty, vulnerability or both? Are the technological changes in Kenya’s economy creating demand for ‘low-skill’ labour?

An observation made in the sections that follow is that while most of the fundamental tools and technologies of the late 19th and early 20th century were slowly adopted in Kenya, very few diffused rapidly or widely. And while many of the advanced technologies of the 21st century in transportation, healthcare, electronics and energy are now available in Kenya, only a narrow subset of them - particularly consumer telecoms technologies - have been embedded throughout the economy in households and businesses.

2.2 The pace and origins of Kenya’s growth in the 21st century

Since its independence in 1963, Kenya’s economic performance has been uneven and its growth has been punctured by volatility, evidence of Kenya’s vulnerability to external and domestic shocks (Figure 2) - importantly its continued dependence on under-capitalized, rain-fed agriculture (Handjiski et. al., 2016). For Kenya to reach upper middle-income status by 2030 will require GDP growth of about 7 percent per year. Historically, Kenya has achieved more than 7 percent growth in only 4 years.

24. ‘Low skill’ is used as a shorthand for workers with no or only a few years of schooling, education or technical training. In Kenya, only about 1 in 5 adults whose primary income source is farming, casual work or non-farm self-employment have reached secondary level education (FinAccess 2019).
Countries that transformed average living standards for their populations in the span of a generation were able to sustain moderate but not necessarily the double-digit growth rates that China was able to achieve (Figure 3). Thailand for example sustained a spell of growth of 4 percent per year during the 1960s, 70s and 80s - its income per capita rose from USD 571 in 1960 to USD 2,283 in 1989. Korea’s transformation from a low to a high-income country in the 40 years between 1960 and 2000 saw income per capita increase by a factor of 16 from USD 944 to USD 15,104. Economic transformation during this period wasn’t limited to Asian countries. In Sub-Saharan Africa, Botswana lifted average incomes from USD 391 in 1960 to USD 3,718 in 1990, becoming an upper middle-income country in the span of 30 years.
By contrast, the Kenyan economy hasn’t meaningfully lifted average living standards until recently. There was a modest improvement in the period shortly after independence when GDP per capita rose from USD 538 in 1960 to USD 820 in 1974, but for the rest of the period, average living standards were stagnant and even declined in the 1990s. Kenya’s economy began to shift gears in 2003 when GDP growth rates reach into the 5 and 6 percent per year range and by outpacing population growth, pull up output per capita to its current level of USD 1,169.

Despite the fact that Kenya has been growing at an average rate of 4.9 percent per year since 2000, its growth has been slow compared to a group of 13 regional and global peers with similar GDP per capita in 2000 (Figure 4). Between 2000 and 2017, most of its regional neighbours grew faster, for example Ethiopia grew at an average rate of 9.5 percent per year, Rwanda at 7.3 percent and Uganda and Tanzania at 6.5 percent. From this perspective East Africa’s largest economy is under-performing and has been hobbled by domestic shocks - such as the wave of violence that followed the 2007 elections as well as international shocks following the 2008 financial crisis and most recently an extended drought.

Figure 3: 15 countries were able to sustain more than 25 years of 5% growth since 1960.

Real GDP per capita, by country, 1960–2017

Constant 2010 USD

<table>
<thead>
<tr>
<th>Country</th>
<th>GDP growth rate (p.a.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>China</td>
<td>+8.6%</td>
</tr>
<tr>
<td>Botswana</td>
<td>+8.2%</td>
</tr>
<tr>
<td>Korea, Rep.</td>
<td>+7.5%</td>
</tr>
<tr>
<td>Singapore</td>
<td>+7.3%</td>
</tr>
<tr>
<td>Malaysia</td>
<td>+6.3%</td>
</tr>
<tr>
<td>Oman</td>
<td>+6.1%</td>
</tr>
<tr>
<td>Thailand</td>
<td>+6%</td>
</tr>
<tr>
<td>Hong Kong SAR, China</td>
<td>+5.7%</td>
</tr>
<tr>
<td>Myanmar</td>
<td>+5.4%</td>
</tr>
<tr>
<td>Indonesia</td>
<td>+5.3%</td>
</tr>
<tr>
<td>India</td>
<td>+5.2%</td>
</tr>
<tr>
<td>Panama</td>
<td>+4.6%</td>
</tr>
<tr>
<td>Turkey</td>
<td>+4.3%</td>
</tr>
<tr>
<td>Kenya</td>
<td>+4.3%</td>
</tr>
<tr>
<td>Bangladesh</td>
<td>+3.9%</td>
</tr>
</tbody>
</table>

Source: World Bank, World Development Indicators Database. Notes: Only countries where more than 50% of all years between 1960 and 2017 had GDP growth exceeding 5% are shown (plus Kenya). The average annualized GDP growth rate for each country over the period is shown in parentheses. The annotations ‘L’, ‘LM’, ‘UM’ and ‘H’ denote the range of the following country income groups: Low, Lower middle, Upper middle and High. A log scale is used for the y-axis (GDP per capita).
Figure 4: Since 2000, Kenya’s annual GDP growth averaged 4.9 percent per year, can it shift gears to achieve the higher rates of 6 and 7 percent per year seen among peer countries?

Real GDP growth (annual % change)
Based on constant 2010 US$

A similar picture emerges looking at the evolution of GDP per capita since 2000 (Figure 5). Among its peers, only Senegal and Pakistan had slower rates of GDP per capita growth. India and Vietnam - who were poorer than Kenya in 2000 in per-capita terms - are now 60 percent richer. Other countries - such as Cambodia and Bangladesh have closed the gap with Kenya, despite being significantly poorer than Kenya in 2000.
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**Figure 5:** Compared to a group of global peer countries, the pace of growth of Kenya’s GDP per capita has been slow since 2000 but is accelerating.

![Figure 5: Real GDP per capita, 2000–2017](image)

Source: World Bank, World Development Indicators Database

Industrialization - the process by which the profile of country’s economic output and employment shifts away from agriculture towards manufacturing and other industrial activities and then later towards services - characterized the development trajectory of Europe, North America and successful countries in Asia (such as Japan, China, Taiwan and Korea). Kenya’s growth since the early 1960s has not followed this path, though agriculture has declined in importance relative to both output, and to a lesser degree, employment. In 1960, agriculture made up 44 percent of GDP. By 2017, its share declined by almost half to 25 percent of Kenya’s domestic output (Figure 6).

**Figure 6:** Between 1964 and 2017, Kenya’s GDP increased by a factor of 10 and the sector with the largest contribution to output shifted from agriculture to services.

![Figure 6: GDP by sector, 1963 – 2017](image)

Source: World Bank, World Development Indicators. Notes: The labels overlaid on each sector represent the share of each sector in overall GDP (rounded).
While industry grew in importance in the 1970’s (rising from 15 to 22 percent of GDP between 1970 and 1980) its share has remained more or less constant since then, with manufacturing’s share in GDP also remaining constant at 11 percent. Similar to the experience of many of its peer countries, the services sector has accounted for much of Kenya’s recent growth. Between 2000 and 2017, Kenya’s GDP doubled, and services accounted for 58 percent of this expansion (Figure 8). Services also contributed to more than 55 percent of growth in Rwanda, India, Zambia, Uganda, Senegal, Ghana and Pakistan. The contribution of industry to Kenya’s growth, however, was only 22.5 percent of the change in output between 2000 and 2017. In contrast industry contributed more than 35 percent of GDP growth in Vietnam, Bangladesh, Cambodia and Zambia.

In the 1990s and 2000s, annual growth in services averaged 3.5 percent. In the 8 years since the start of 2010, average annual growth in services accelerated to 5.8 percent (Figure 7). Driving this recent acceleration has been the information and communications sub-sector (+10.9 percent per year on average since 2009), finance and insurance (+7.4 percent per year), education (+7.1 percent per year) and wholesale and retail trade (+6.5 percent per year). Between 2009 and 2017, the share of service sector GDP originating from the information and communication subsector increased from 5.2 to 8 percent, while the share originating from financial services increased from 10.7 to 12.1 percent.

Figure 7: Services and industry are the fastest growing sectors of Kenya’s economy.

25. This pattern of industrial growth post-independence followed by decline is similar to the experience of other countries in Africa which pursued state-led protectionist policies in the 1960s and 1970s but then faced external shocks including oil price increases, commodity price decreases and the limitations of domestic markets (Signé, 2018). In the early years of Kenya’s independence, Kenya pursued an import substitution (IS) strategy which succeeding in boosting some industries, in particular, paper, textiles and garment manufacturing, food processing, and leather tanning and footwear of which many in food, beverages and tobacco are still important today. However, the IS strategy but ultimately failed at creating much employment and became increasingly oriented to production for the domestic market, and therefore whose potential was severely limited by its size and purchasing power (Ngui, 2016).
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**Figure 8:** Like many of its peer countries, Kenya’s services sector has accounted for a dominant majority of its GDP growth since 2000.

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Ethiopia</td>
<td>50.5% 20.8% 28.8%</td>
<td>1x</td>
</tr>
<tr>
<td>Rwanda</td>
<td>59.2% 12.3% 21.6%</td>
<td>2x (GDP doubled)</td>
</tr>
<tr>
<td>India</td>
<td>60.1% 31.2% 8.7%</td>
<td>3x</td>
</tr>
<tr>
<td>Cambodia</td>
<td>45.5% 36.8% 17.6%</td>
<td>4x</td>
</tr>
<tr>
<td>Tanzania</td>
<td>50.6% 31.2% 16.3%</td>
<td></td>
</tr>
<tr>
<td>Zambia</td>
<td>62.5% 37.8%</td>
<td></td>
</tr>
<tr>
<td>Bangladesh</td>
<td>52.4% 37% 10.8%</td>
<td></td>
</tr>
<tr>
<td>Uganda</td>
<td>62.3% 23.9% 13.8%</td>
<td></td>
</tr>
<tr>
<td>Vietnam</td>
<td>46.1% 42% 11.9%</td>
<td></td>
</tr>
<tr>
<td>Senegal</td>
<td>64.8% 24% 11.3%</td>
<td></td>
</tr>
<tr>
<td>Ghana</td>
<td>55.9% 27.6% 18.5%</td>
<td></td>
</tr>
<tr>
<td>Kenya</td>
<td>58.1% 22.5% 19.5%</td>
<td></td>
</tr>
<tr>
<td>Pakistan</td>
<td>63.4% 22.7% 13.9%</td>
<td></td>
</tr>
</tbody>
</table>

Source: World Bank, World Development Indicators Database. Notes: Labeled percentages indicate the overall contribution to GDP growth of each sector.

**Figure 9:** Apart from agriculture, Kenya’s five largest sub-sectors are manufacturing, real estate, wholesale and retail trade and education.26

<table>
<thead>
<tr>
<th>Year</th>
<th>Agriculture</th>
<th>Industry</th>
<th>Services</th>
</tr>
</thead>
<tbody>
<tr>
<td>2009</td>
<td>100%</td>
<td>100%</td>
<td>100%</td>
</tr>
<tr>
<td>2013</td>
<td>100%</td>
<td>100%</td>
<td>100%</td>
</tr>
<tr>
<td>2017</td>
<td>100%</td>
<td>100%</td>
<td>100%</td>
</tr>
</tbody>
</table>

Source: Central Bank of Kenya. Notes: Labeled percentages indicate the share of each sub-sector in sectoral GDP.

26. Unlike the CBK, the Kenya National Bureau of statistics does not include manufacturing in industry.
While the rate of growth in industry has accelerated, in the past 10 years, manufacturing has slowed down. In the 1990s, industrial activity (GDP) increased by only 1.5 percent per year on average, in the 2000s it increased to 4.3 percent and since 2010, industry has been growing by 5.6 percent per year. The primary driver of industrial growth since 2009 has been construction, which grew at an average rate of 9.9 percent per year, increasing its share of industrial sector GDP from 20 percent in 2009 to 29 percent in 2017 (Figure 9). While small in size, mining and quarrying increased at an average annual rate of 11.3 percent per year increasing its contribution to industrial GDP from 3.4 to 5.7 percent. This expansion is in large part due to the Kwale Mineral Sands Titanium mining project run by Base Resources. Titanium ore exports commenced in late 2013 and now account for over half of Kenya’s mineral exports27. The electricity and water sector also grew rapidly at 7.4 percent per year.

The manufacturing sector grew at 3.8 percent per year in the 2000s and fell to 3 percent in 2010-2018 with its contribution to industrial GDP falling from 63.8 to 51.5 percent. Manufacturing continues to focus on consumer goods and the composition of manufacturing GDP has remained largely the same since 2000, with processed food and beverages, apparel and wood-based products continuing to make up around three-quarters of manufacturing value-added (Figure 11). Between 2000 and 2008, the output of petroleum products expanded by a factor of 7 and the output of non-metallic mineral products (cement) expanded by a factor of 8, causing a relative increase in their shares in manufacturing GDP. In the former case, the increase was driven the Mombasa oil refinery which processed imported crude petroleum into petroleum products for the domestic market but which shut down in 2015. In 2016, the most important products in manufacturing value added were beverages (12 percent), textiles (10 percent) and chemical products (9 percent).

Figure 10: In the past 8 years, Kenya’s hottest sub-sectors have been mining & quarrying, ICT, construction and finance.

Figure 11: Average annual growth rate (%)

![Graph showing average annual growth rate for various sectors from 2009 to 2017](source)

Source: Central Bank of Kenya.

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Agriculture has contributed the least to GDP growth. Performance in this sector is highly correlated with rainfall (Pape et al. 2018) and certain sub-sectors - such as horticulture 28 - were adversely affected by reductions in demand from Europe after the financial crisis. In 2017 growth in agricultural output fell to 1.57 percent. Contributing to the poor performance of the agricultural sector recently has been an extended period of drought in large areas of Kenya which reached its peak in 2017, resulting in more food insecurity, increased burden to households resulting from the greater time and effort required to get to water sources 29 and declining crop harvests. For example, agricultural production of maize fell by nearly half between 2011 and 2017, from 406 to 239 thousand tonnes in 2017. Production of other key crops (such as wheat, sugar cane, tea) and animal products (such as milk) all fell substantially between 2016 and 2017.

Figure 11: The composition of manufacturing value-added has changed little since 2000, with processed foods and beverages, apparel manufactures and wood products continuing to make up three quarters of manufacturing GDP.

On the demand side, between 2000 and 2017, household consumption contributed the most to GDP growth (Figure 12, 13). Gross fixed capital formation (public and private infrastructure investment) was the second largest demand-side contributor to GDP growth. In an effort to lower economy-wide transaction and production costs, the government has invested in large infrastructure projects such as the Thika highway, Northern and Southern bypasses and the Standard Gauge railway. Foreign direct investment has also financed large projects, such as the Lake Turkana wind farm which is supplying up to 17 percent of Kenya’s installed capacity. Between 2000 and 2017, exports expanded by 16.5 percent while imports grew by 40 percent. Consequently, the contribution of net exports to GDP was negative over this period.

28. Just as dualist models of the economy emphasize differences in productivity across sectors, Kenya’s agricultural sector is also characterized by productivity differences within it. Food production is typically low-yield while there are a few high-yield export commodities such as cut-flowers, coffee and tea.

29. See: https://reliefweb.int/disaster/dr-2014-000131-ken
Using macroeconomic models, Pape et al. (2018) estimate that between 2000 and 2015 real GDP growth was driven predominantly by increases in Kenya’s labour force, but labour’s contribution declined from around 60 to 40 percent, while the contribution of the capital stock increased from an average of 12 to 34 percent. The contribution of total factor productivity (TFP) to GDP growth remained in the 20 to 30 percent range over the period. By comparison, TFP was the largest contributor to real GDP growth between 2000-2015 in Tanzania and Rwanda, contributing an average of 46 and 38 percent, respectively. In additional analyses, labour productivity (output per worker) is identified as the most important contributor to real GDP per capita growth over the period, followed by demographic change (growth in the working age population).

In addition, Pape et al. provide evidence that the key dynamic underpinning overall productivity growth was the transition of labour from the lower-productivity agricultural sector to the higher-productivity services sector. Regionally, the contribution to growth in income per capita resulting from labour productivity in Kenya between 2005 and 2015 was the lowest - averaging 81 percent over the period compared to a high of 98 percent in Rwanda. The contribution to growth in GDP per capita from demographic change in Kenya was the highest, averaging 20 percent compared to a low of 3.2 percent in Rwanda. However, even as the economy benefitted from the demographic dividend, growth in job creation did not match the growth in the working age population, as demonstrated by the declining employment rates. As a result, the employment rate contribution to GDP per capita growth was negative at -6.3 percent for Kenya.

In an analysis using harmonized sectoral employment and output data from the Groningen Growth and Development Center (GGDC) up to 2011, Xinshen Diao, Margaret McMillan, and Dani Rodrik (2018) examine growth accelerations for a number of countries in Asia, Latin America and Africa to unpack how much of economywide labour productivity growth was due to shifts in employment between sectors versus improvements in productivity within sectors. During a growth acceleration from 2003 - 201130 Kenya’s economywide labour productivity growth of 1.48 percent per year was the lowest among a group of 11 African countries31. During this period of acceleration,

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30. In the 6 years leading to 2003, growth declined by 0.35 percent per year, and in the 6 years after, growth (per capita) increased by 2.08 percent per year. 2011 is the last year of data available in the GGDC dataset. Yearly Kenya data on output and employment by sector is derived from various sources and imputed when data is missing. For an in-depth technical discussion of the GGDC sources and methods see: https://www.rug.nl/ ggdc/docs/10sector_sm_jan2015.pdf.

31. The African countries included in the sample were: Botswana, South Africa, Mauritius, Nigeria, Ghana, Senegal, Kenya, Zambia, Tanzania, Malawi and Ethiopia.
within sector labour productivity grew at 1.18 percent per year while labour productivity from structural change was 0.30 percent per year. The relative contributions of the within and between components of labour productivity growth in Kenya make it similar to Ghana, Nigeria and South Africa in that their growth episodes were characterized by very weak structural change and positive productivity growth in the non-agricultural sector. In contrast, Ethiopia, Malawi, Rwanda, Senegal and Tanzania are classified as countries whose growth episodes were characterized by strong structural change accompanied with negative productivity growth in the non-agricultural sector.

In an interesting extension of their analyses, Diao et al examine the long-term growth patterns of four countries that were able to sustain growth accelerations for three to four decades: Botswana, Ghana, India and Mauritius. While the initial triggers of sustained growth in each of these cases differed, what was common across all four countries was the within-sector labour productivity growth that made a positive contribution to economywide labour productivity growth early on and that became increasingly important over time. Structural change also played an important role in the early years of their accelerations but especially for Botswana. Interestingly, manufacturing played a prominent role in labour productivity growth only in Mauritius. In both Ghana and India, manufacturing employment stagnated at around 12 percent of total employment during their growth episodes. But what distinguished India from Ghana is the acceleration of within-sector productivity growth over their 30-year growth episodes, such that in the last 10 years of those episodes, within-sector productivity growth in India was greater than 5 percent per year, compared to 2 percent per year in Ghana.

Diao et al conclude that “productivity growth in the modern sectors is the sine qua non of longer-term development” and that “the growth experiences that raise the greatest concern with respect to sustainability are those that exhibit stagnant or declining within-sector labour productivity in the modern sectors”. From this perspective, the fact that a modern services sector in Kenya has emerged (like Ghana and India) showing evidence of positive within-sector productivity growth is encouraging.

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32. “Diamond discoveries in Botswana in the mid-1960s, the creation of an export processing zone and the emergence of a labour-intensive manufacturing sector in Mauritius in the early 1970s, and business- and market friendly reforms that unleashed private sector investment in Ghana and India during the 1980s” (Diao et al, 2018).
2.3 Employment and job creation

The quantity and quality of jobs available in an economy are critical to a country’s standard of living. Jobs give people an opportunity to convert their abilities, skills and knowledge into income. Through on-the-job learning, specialization and technology-transfer, jobs also play an important role in boosting overall productivity. Jobs that bring people from diverse backgrounds together can also play a role in fostering social connection, cohesion and trust.

When people think about jobs, they often think about formal jobs - contracts between a formal firm and an individual that offers a regular wage or salary commensurate with a set of production expectations (e.g. hours worked) with the possibility of additional (possibly legally required) benefits such as worker safety, health insurance or vacation. But these jobs are scarce. Kenya’s working age (15+) population of around 28 million is now growing by close to 800 thousand individuals per year, by comparison, 103 thousand modern wage jobs were created in 2017 and 78,400 were created in 2018 (Figure 14).

The growth of Kenya’s education sector is increasingly driven by private sector investment. Between 2009 and 2017, wage employment in private education more than doubled, adding 127 thousand jobs (compared to 106 thousand in the public sector) and the number of private primary schools almost tripled, going from 5,055 in 2010 to 13,699 in 2018 (KNBS 2014, 2019).

While the growth in the number of secondary schools nearly doubled for both private and public providers, the government has added over 4,300 new secondary schools as it pushes for 100 percent transition of pupils from primary to secondary.

The growth in private education reflects a growing demand generally by parents for their children to have the skills needed for a brighter future. How to finance education is on the minds of parents across the country and is a major motivator behind specific economic and financial decisions families take - including savings and borrowing behaviors (Collins et al., 2015).

Additionally, congestion (as a result of increased enrollment following the introduction of free and compulsory primary education in 2003) and dissatisfaction with the quality of public schools has underpinned demand for alternatives. Some evidence suggests that private primary schools provide better value as their per-pupil spending is lower and performance on the KPCE is higher compared to public schools (Bold et al. 2011), though the role and desirability of private schools in delivering education is a question continues to be debated (Edwards, 2017).
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**Figure 14:** The size of workforce is growing far faster than the number of wage jobs.

In Kenya, the most salient long-term transition in employment has been its shift away from small-scale family farming and towards non-farm self-employment and wage work. In 1989, a majority of working Kenyans at every age worked on family farms, but by 2009, only very young workers and those above 50 had majorities of their age group working on family farms (World Bank, 2012). These employment shifts mirror the transition in GDP from agriculture towards services as well as the growth of cities - between 1989 and 2018 Kenya’s urban population share nearly doubled from around 17 to 30 percent (World Bank, 2016a).

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Figure 15: Between 1969 and 2006, the share of Kenya’s total employment in agriculture fell from 81 to 51 percent, as employment shifted to services – primarily in trade – and manufacturing.

Total employment shares, by sector, Kenya (1969–2016)

Total employment shares, by sector, comparison countries (1969–2016)

Source: 10–sector database. Notes: Employment shares by sector are labeled for benchmark years, that is, years for which estimates are based on either labor force surveys (1979, 1999, 2006) or on census data supplemented by other sources. Only the agricultural share of employment is labeled for Kenya’s comparison countries.

Of the 2.76 million modern sector jobs in Kenya (representing 10 percent of the working age population), 70 percent are private sector jobs and 30 percent are public sector jobs (KNBS, 2019). In the private sector, four activities account for more than 50 percent of its 1.92 million wage jobs: Agriculture, forestry and fishing (294.3 thousand jobs), manufacturing (281.1 thousand jobs), wholesale and retail trade (259 thousand jobs) and education (223.9 thousand jobs). However, between 2009 and 2017, the two largest sectors in terms of employment, agriculture and manufacturing, only added a net of 33 thousand jobs between them (the agricultural sector lost 5 thousand wage jobs during this period). Close to 70 percent of all the new formal wage jobs added in both the public and private sectors between 2009 and 2017 were in education (200 thousand additional jobs), other services (114 thousand additional jobs), wholesale and retail trade (97 thousand additional jobs) and construction (75 thousand additional jobs).

In general, the relationship between economic growth and formal wage employment growth has been weak (Figure 16). For example, in the 2009-2017 period, the two fastest growing sectors: mining and quarrying, and ICT, added almost the same number of jobs (54.6 thousand) as the two slowest growing sectors: manufacturing and accommodation and restaurants (53.7 thousand). The three sectors growing robustly in real GDP value added terms (in the range of 6 to 10 percent per year on average) while also adding sizeable numbers of wage jobs were education (see Box 1), construction and wholesale and retail trade.

While the number of new formal “good” jobs is scarce in relation to the cohorts of young Kenyans entering working age - contributing to high un- and under-employment - (See Box 2) a more fundamental jobs challenge is that a majority of Kenyan workers are locked into low productivity jobs both in the informal and formal sector.
Exploring the links between finance, technology & growth in Kenya

In the formal sector, there appears to be significant inefficiency in the way capital and labour is distributed across firms (known as "allocative inefficiency"). In a well-functioning market economy, more competitive firms displace less productive firms, and are able to grow by capturing more of the market (in either volume or value terms). In Kenya, two pieces of evidence suggest the existence of significant distortions that prevent resources (capital and labour) from moving to their most productive use. First, high performing large firms co-exist with low productivity large firms and second there is very little correlation between productivity and firm size, suggesting that the most productive small firms fail to grow (Timmer, 2018).

Studies of firm-level data that included Kenya assessing the underlying causes of allocative inefficiency suggest that higher productivity firms disproportionately face a cluster of costs - including inefficient financial markets, cumbersome business regulations and poor infrastructure. As a result, these firms invest less in capital and labour and are not able to expand effectively (Cirera et al. 2017). An additional challenge is that firm creation in the formal sector is low. Less than 1 in 5 firms in the manufacturing and services sectors are less than five years old, compared to over 1 in 3 in the United States and Ethiopia though it is unclear whether this reflects barriers to start-up or barriers to formalization (World Bank, 2016b). Kenya’s informal jobs also suffer from a productivity gap with similar jobs in the formal sector. For example, data from the 2013 Informal Enterprise survey finds that labour productivity is 8.4 times higher in formal microfirms compared to informal microenterprises and these differences hold up in both manufacturing and services.
**Figure 16:** Kenya’s fastest growing sectors aren’t the sectors adding the greatest number of wage jobs.

![GDP versus wage employment, by sub sector, 2009 and 2017](image)

Source: Central Bank of Kenya (CBK) and Kenya National Bureau of Statistics Economic Survey 2018

### 2.4 Technology and economic complexity

**Figure 17** shows the relative intensity of a set of 16 technologies and tools in Kenya’s economy between 1980 and 2017. Of these, the majority more or less remained at the same level of intensity relative to the size of the economy while seven increased markedly over this time period: Mobile cellular subscriptions, mobile money accounts, fixed broadband subscriptions, bank accounts, loan accounts and motorcycles. Notably, production technologies in agriculture including fertilizer consumption, irrigated land, tractors and harvesters have not risen in intensity.

Key transportation infrastructure such as the railway network and paved road have also not diffused widely. For example, the Uganda railway33 completed in 1901 came almost 100 years after the world’s first steam powered journey took place, giving Kenya 930 km of track from Mombasa to Kisumu. After the British added several branch lines and links to Tanzania and Uganda throughout the 1920s, 30s and 40s, by the time of Kenya’s independence, the total system had about 2,700km of track which remained unchanged through 2016. While relatively old production and infrastructure technologies have not diffused significantly in Kenya, there is one recent exception: the internal combustion engine.

Between 2006 and 2007, new registrations of motorcycles more than doubled from 6,250 to 16,293. In 2008, new registrations tripled to 51,412 and in 2017, 191,501 motorcycles were newly registered. The total stock of motorcycles is now approaching the total stock of all other motor vehicles combined. Several factors appear to have supported the spread of motorcycles: (1) In 2007, low cost, imported motorbikes were made more affordable by the government’s exemption of models with engines below 250cc from a 16 percent value added tax, (2) decades of under-investment in road infrastructure and lack of public transport created significant latent demand for transportation services in a context of a growing and more dynamic economy, and (3) availability of financing through SACCOs, savings groups and other informal loans that enabled lower income Kenyans to raise funds for up-front purchase. While it is not yet clear what social and economic ripple effects are being caused by the proliferation of motorbikes, the cumulative impact is likely significant.

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33. The Uganda Railway was originally built by the British to provide Uganda with access to the sea. Construction began at Mombasa in 1896 and reached Lake Victoria in 1901.
"We are so many of us and more are still coming into the sector but I cannot complain because the machines have offered me and others a job I could not get elsewhere," said Moses Otanga, a motorcycle operator in Kitengela, a suburb on the outskirts of Nairobi. Excerpt from “Kenya’s motorbike economy roars as imports hit new high.” (Xinhua net, 2017)

“We promote the 24-hour economy. We are the people who ferry many home even past midnight enabling them to work as long as they want without worrying about how to get home. We operate long after the passenger service vehicles have gone home.” - Kenya Boda Boda association. Excerpt from “Kenya’s motorbike economy roars as imports hit new high.” (Xinhua net, 2017)

“When I heard about BUCOMOT (Bungoma County Motorbike Sacco Ltd), I sold my cow and joined the SACCO," he told me in his place of business. This enabled him to access a loan that enabled him to buy his motor-bike. Boniface is now the proud owner of his own motorbike. He tells me that owning the motor bike has brought a lot of social and financial difference in his life. He has been able to educate his daughter up to form four, something that he says would have been impossible without his motor-bike. His wife now uses most of her time to tend to their farm and animals, unlike previously when she had to fend for the whole family, and also cater for the medical bills. Excerpt from “Chinese motorcycles in Kenya: A pass out of poverty?” (Africa-China reporting project, 2016)

In 2017 Honda launched Kenya’s first motorcycle manufacturing facility34, several other firms including Yamaha and Bajaj have established

distribution centres, and the large demand for motorbike-enabled transportation services is attracting manufacturing and software start-ups like the Dutch Kibo bike and GetBoda - a motorcycle courier service\textsuperscript{35}. So apart from the direct benefits from the presumably positive average return accruing to individuals investing in motorbikes and offering transportation services with them, the indirect spillovers from the knowledge, know-how and skill transfer resulting from increased manufacturing activity by both established motor-vehicle firms and innovative start-ups could be even more significant in the long run. In rural villages or even in Nairobi’s informal settlements, mobile phones may well be the only 21\textsuperscript{st} century technology you will encounter. Handheld mobile phones were invented by Motorola in 1973, the first models were introduced in Kenya around the time the telecommunications sector was liberalized in 1999 and began to take off in the early 2000s. Several reasons account for their proliferation. Firstly, technological advances along with economies of scale in network equipment and handsets in the developed world led to price declines. Additionally, the introduction of pre-paid billing systems lowered service costs by eliminating the need for operators to send bills and collect debts, thus making mobile phones accessible to lower income consumers. Finally, deregulation created a competitive marketplace, further reducing prices and bolstering mobile phone adoption\textsuperscript{36}.

### Figure 18: The most remarkable changes in access to technology in homes in the past 15 years has been mobile phones and electricity, particularly from solar panels in rural areas.

<table>
<thead>
<tr>
<th>Household access to basic infrastructure and technology</th>
<th>% of households (% of adults for mobile phone ownership)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Rural</strong></td>
<td></td>
</tr>
<tr>
<td>2006</td>
<td>0</td>
</tr>
<tr>
<td>2009</td>
<td>4</td>
</tr>
<tr>
<td>2013</td>
<td>14</td>
</tr>
<tr>
<td>2016</td>
<td>28</td>
</tr>
<tr>
<td>2019</td>
<td>52</td>
</tr>
<tr>
<td>Mobile phone</td>
<td>79</td>
</tr>
<tr>
<td>Electricity from grid or solar</td>
<td>71</td>
</tr>
<tr>
<td>Electricity from solar</td>
<td>63</td>
</tr>
<tr>
<td>Concrete/stone/brick wall</td>
<td>35</td>
</tr>
<tr>
<td>Water piped into dwelling/yard</td>
<td>16</td>
</tr>
<tr>
<td>Electricity/gas cook fuel</td>
<td>4</td>
</tr>
<tr>
<td>Flush toilet</td>
<td>0</td>
</tr>
<tr>
<td><strong>Urban</strong></td>
<td></td>
</tr>
<tr>
<td>2006</td>
<td>0</td>
</tr>
<tr>
<td>2009</td>
<td>1</td>
</tr>
<tr>
<td>2013</td>
<td>5</td>
</tr>
<tr>
<td>2016</td>
<td>10</td>
</tr>
<tr>
<td>2019</td>
<td>20</td>
</tr>
<tr>
<td>Mobile phone</td>
<td>73</td>
</tr>
<tr>
<td>Electricity from grid or solar</td>
<td>71</td>
</tr>
<tr>
<td>Concrete/stone/brick wall</td>
<td>52</td>
</tr>
<tr>
<td>Water piped into dwelling/yard</td>
<td>37</td>
</tr>
<tr>
<td>Electricity/gas cook fuel</td>
<td>42</td>
</tr>
<tr>
<td>Flush toilet</td>
<td>3</td>
</tr>
<tr>
<td>Electricity from solar</td>
<td>4</td>
</tr>
</tbody>
</table>


The spread of low-cost mobile phones and network infrastructure behind the remarkable rise of mobile phone ownership rates from 27 to 84 percent of the population (Figure 18) and mobile cellular subscriptions from around 7,000 in 2007 to over 40 million in 2017 (Figure 17), enabled new innovations and possibilities. The most obvious example of this is the invention and refinement of mobile money, which grew explosively between 2007 and 2015. Apart from benefiting the telecommunications sector, the widespread availability of mobile communications has been particularly important to the efficiency of the financial sector. Banks for example, have successfully turned mobile phones and mobile money into accounts and delivery platforms for loans, avoiding investments in bank branches and staff. For example, between 2002 and 2016 the number of deposit account holders per bank staff increased twenty-fold from 60 to 1,209 (CBK, 2016).

\textsuperscript{35} Several other e-commerce, transportation and logistics start-ups use motorbikes e.g. Sendy, Uber and SafeBoda

In addition, cellular networks and mobile money have enabled the emergence of endogenous innovations, such as the M-KOPA solar home system – a solar panel that can be purchased with an-upfront deposit of USD 30 and daily payments of 50 cents – which have contributed to the rise in ownership of solar panels in rural areas, from less than 4 percent of households in 2013 to 32 percent of households in 2018 (Figure 18).

From computer programming to the technical and managerial know-how required to run successful telecommunications operations, it is clear that Kenya’s capabilities and skills in ICT are impressive and have grown significantly. But how has Kenya’s know-how and production capabilities changed more broadly? The Growth Lab at Harvard has developed an index of economic complexity to measure the knowledge in a society as expressed in the products it makes. The economic complexity of a country is calculated based on the diversity of exports a country produces and their ubiquity, or the number of the countries able to produce them. Globally the economic index ranges from a low of -1.7 (Papua New Guinea) to a high of 2.3 (Japan), with a median of -0.16 (Chile). Between 1995 and 2016, Kenya’s economic complexity did not change significantly unlike Vietnam, Uganda and Cambodia (Figure 19, 20).

**Figure 19: Trends in the Economic Complexity Index (ECI), Kenya and peer countries, 1995.**

<table>
<thead>
<tr>
<th>Country economic capabilities, Kenya and peer countries, 1995–2015</th>
<th>Economic complexity index (ECI)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Uganda</strong></td>
<td><strong>Vietnam</strong></td>
</tr>
<tr>
<td>-1.64</td>
<td>-0.32</td>
</tr>
<tr>
<td><strong>Ghana</strong></td>
<td><strong>Pakistan</strong></td>
</tr>
<tr>
<td>-1.28</td>
<td>-0.41</td>
</tr>
<tr>
<td><strong>Bangladesh</strong></td>
<td><strong>Senegal</strong></td>
</tr>
<tr>
<td>-0.96</td>
<td>-0.27</td>
</tr>
</tbody>
</table>

Source: Growth Lab, Center for International Development, Harvard. Notes: The estimated trend is shown as a solid line.

37. To date M-Kopa has connected over 600,000 homes with solar home systems, which represents about 11 percent of the 5.4 million rural households counted in the 2009 population and housing census.

To illustrate why this is the case, Figure 21 shows the ranking of the forty largest exports by value in Kenya and Vietnam in 1995 and 2016. In 1995, four exports accounted for 70 percent of Kenya’s shipments: Transport services, ICT services, travel and tourism services, coffee and tea. In 2016, the same four exports plus finance and insurance, and cut flowers accounted for 70 percent of exports by value. In Vietnam by comparison both the number and composition of exports that accounted for 70 percent of total export value, changed dramatically. For example, Vietnam’s top 5 exports in 1995 were: Crude oil, Coffee, Rice, Crustaceans and Leather footwear, in 2016: Transmission components for radios, TV and other electronics and electronic integrated circuits make the list. While in 1995, 14 goods or services made up 70 percent of exports in Vietnam by 2016 the list more than doubled to 35, with a large number in the category of electronics or machinery.
Figure 21: With the exception of financial services, Kenya’s exports have not diversified significantly since 1995. Vietnam in contrast, completely transformed its export portfolio away from agricultural commodities to electronics.

### Top 40 exports for Kenya and Vietnam, 1995 & 2016

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Transport</td>
<td>Transport</td>
<td>Travel and tourism</td>
<td>Travel and tourism</td>
<td>Cut flowers</td>
</tr>
<tr>
<td>ICT</td>
<td>ICT</td>
<td>Tea</td>
<td>Travel and tourism</td>
<td>Cut flowers</td>
</tr>
<tr>
<td>Travel and tourism</td>
<td>Travel and tourism</td>
<td>Cut flowers</td>
<td>Travel and tourism</td>
<td>Cut flowers</td>
</tr>
<tr>
<td>Coffee</td>
<td>Coffee</td>
<td>Legumes</td>
<td>Legumes, dried</td>
<td>Other nuts</td>
</tr>
<tr>
<td>Tea</td>
<td>Tea</td>
<td>Carbonates</td>
<td>Other nuts</td>
<td>Other nuts</td>
</tr>
<tr>
<td>Cut flowers</td>
<td>Cut flowers</td>
<td>Cements</td>
<td>Coppers</td>
<td>Coppers</td>
</tr>
<tr>
<td>Fish fillets</td>
<td>Fish fillets</td>
<td>Fruits and nuts, otherwise prepared</td>
<td>Fruits and nuts, otherwise prepared</td>
<td>Fruits and nuts, otherwise prepared</td>
</tr>
<tr>
<td>Legumes</td>
<td>Legumes</td>
<td>Tanned hides of bovines or equines</td>
<td>Tanned hides of bovines or equines</td>
<td>Tanned hides of bovines or equines</td>
</tr>
<tr>
<td>Flat rolled iron, width &gt; 600mm, clad</td>
<td>Flat rolled iron, width &gt; 600mm, clad</td>
<td>Tanned hides of bovines or equines</td>
<td>Tanned hides of bovines or equines</td>
<td>Tanned hides of bovines or equines</td>
</tr>
<tr>
<td>Vegetable saws and extracts</td>
<td>Vegetable saws and extracts</td>
<td>Tanned hides of bovines or equines</td>
<td>Tanned hides of bovines or equines</td>
<td>Tanned hides of bovines or equines</td>
</tr>
<tr>
<td>Men’s shirts</td>
<td>Men’s shirts</td>
<td>Tanned hides of bovines or equines</td>
<td>Tanned hides of bovines or equines</td>
<td>Tanned hides of bovines or equines</td>
</tr>
<tr>
<td>Carbonates</td>
<td>Carbonates</td>
<td>Tanned hides of bovines or equines</td>
<td>Tanned hides of bovines or equines</td>
<td>Tanned hides of bovines or equines</td>
</tr>
<tr>
<td>Corn</td>
<td>Corn</td>
<td>Wheat or maize flour</td>
<td>Wheat or maize flour</td>
<td>Wheat or maize flour</td>
</tr>
<tr>
<td>Fruit juices</td>
<td>Fruit juices</td>
<td>Insurance and finance</td>
<td>Insurance and finance</td>
<td>Insurance and finance</td>
</tr>
<tr>
<td>Avocados, pineapples, mangoes, etc.</td>
<td>Avocados, pineapples, mangoes, etc.</td>
<td>Petroleum oils, refined</td>
<td>Petroleum oils, refined</td>
<td>Petroleum oils, refined</td>
</tr>
<tr>
<td>Other vegetables</td>
<td>Other vegetables</td>
<td>Petroleum oils, refined</td>
<td>Petroleum oils, refined</td>
<td>Petroleum oils, refined</td>
</tr>
<tr>
<td>Other vegetables, prepared or preserved</td>
<td>Other vegetables, prepared or preserved</td>
<td>Petroleum oils, refined</td>
<td>Petroleum oils, refined</td>
<td>Petroleum oils, refined</td>
</tr>
<tr>
<td>Sisal and agave fibers</td>
<td>Sisal and agave fibers</td>
<td>Commodities not specified</td>
<td>Commodities not specified</td>
<td>Commodities not specified</td>
</tr>
<tr>
<td>Commodities not specified</td>
<td>Commodities not specified</td>
<td>Commodities not specified</td>
<td>Commodities not specified</td>
<td>Commodities not specified</td>
</tr>
<tr>
<td>Tanned skins of other animals</td>
<td>Tanned skins of other animals</td>
<td>Commodities not specified</td>
<td>Commodities not specified</td>
<td>Commodities not specified</td>
</tr>
<tr>
<td>Men’s suits and pants</td>
<td>Men’s suits and pants</td>
<td>Commodities not specified</td>
<td>Commodities not specified</td>
<td>Commodities not specified</td>
</tr>
<tr>
<td>Salt</td>
<td>Salt</td>
<td>Commodities not specified</td>
<td>Commodities not specified</td>
<td>Commodities not specified</td>
</tr>
<tr>
<td>Frozen fish, excluding fillets</td>
<td>Frozen fish, excluding fillets</td>
<td>Commodities not specified</td>
<td>Commodities not specified</td>
<td>Commodities not specified</td>
</tr>
<tr>
<td>Tanned hides of bovines or equines</td>
<td>Tanned hides of bovines or equines</td>
<td>Commodities not specified</td>
<td>Commodities not specified</td>
<td>Commodities not specified</td>
</tr>
<tr>
<td>Medicaments, packaged</td>
<td>Medicaments, packaged</td>
<td>Commodities not specified</td>
<td>Commodities not specified</td>
<td>Commodities not specified</td>
</tr>
<tr>
<td>Mattresses and bedding</td>
<td>Mattresses and bedding</td>
<td>Commodities not specified</td>
<td>Commodities not specified</td>
<td>Commodities not specified</td>
</tr>
<tr>
<td>Other nuts</td>
<td>Other nuts</td>
<td>Commodities not specified</td>
<td>Commodities not specified</td>
<td>Commodities not specified</td>
</tr>
<tr>
<td>Precious stones</td>
<td>Precious stones</td>
<td>Commodities not specified</td>
<td>Commodities not specified</td>
<td>Commodities not specified</td>
</tr>
<tr>
<td>Glass containers for conveyance</td>
<td>Glass containers for conveyance</td>
<td>Commodities not specified</td>
<td>Commodities not specified</td>
<td>Commodities not specified</td>
</tr>
<tr>
<td>Feldspar</td>
<td>Feldspar</td>
<td>Commodities not specified</td>
<td>Commodities not specified</td>
<td>Commodities not specified</td>
</tr>
<tr>
<td>Other live plants</td>
<td>Other live plants</td>
<td>Commodities not specified</td>
<td>Commodities not specified</td>
<td>Commodities not specified</td>
</tr>
<tr>
<td>Buses</td>
<td>Buses</td>
<td>Commodities not specified</td>
<td>Commodities not specified</td>
<td>Commodities not specified</td>
</tr>
<tr>
<td>Soap</td>
<td>Soap</td>
<td>Commodities not specified</td>
<td>Commodities not specified</td>
<td>Commodities not specified</td>
</tr>
<tr>
<td>Motor vehicles for transporting goods</td>
<td>Motor vehicles for transporting goods</td>
<td>Commodities not specified</td>
<td>Commodities not specified</td>
<td>Commodities not specified</td>
</tr>
<tr>
<td>Preserved fish</td>
<td>Preserved fish</td>
<td>Commodities not specified</td>
<td>Commodities not specified</td>
<td>Commodities not specified</td>
</tr>
</tbody>
</table>

Source: Growth Lab, Center for International Development, Harvard. Notes: The products that jointly account for 70% of the total value of exports in a given year are shown in bold. The size of the points associated with each product is proportional to its export value.
Alongside the government’s effort to boost trade through the signing of several free trade agreements such as the Comprehensive and Progressive Agreement for Trans-Pacific Partnership (CPTPP), Vietnam has benefitted from the rise of labour costs in- and its proximity to- China and the resulting incentives for global multinationals and Chinese firms to find an alternative location for labour-intensive assembly and manufacturing facilities for their supply chains. Vietnam’s experience of driving growth through industrialization, insertion into global value chains and its proximity to China and the resulting incentives for global multinationals and Chinese firms to find an alternative location for labour-intensive assembly and manufacturing facilities for their supply chains. Vietnam has benefitted from the rise of labour costs in- and its proximity to China and the resulting incentives for global multinationals and Chinese firms to find an alternative location for labour-intensive assembly and manufacturing facilities for their supply chains. Vietnam has benefitted from the rise of labour costs in-

And among countries that sustained average real GDP per capita growth rates in the range of 2 to 4 percent since 2000 (Kenya’s GDP per capita grew by an average of 2.5 percent per year), some countries such as Pakistan, Ecuador and Nepal had poverty rates decline at rates of over 10 percent per year (Figure 23).
In Africa, countries like Namibia, Liberia and Botswana reduced poverty by over 7 percent per year on average with per capita growth rates in the range of 2 to 3 percent. By comparison, Kenya had a relatively slow rate of decline in poverty of around 1.7 percent per year on average. Kenya’s neighbours - Rwanda, Uganda and Ethiopia - saw poverty rates fall by an average of 2.3, 3.7 and 2.8 percent per year, respectively. At its current pace, Kenya will not meet the SDG goal of eradicating poverty by 2030, to do so would require that it more than triple its rate of poverty reduction to 6.1 percent per year (Pape et al., 2018). Globally, poverty rates tend to decline faster as per-capita GDP grows faster, but the relationship is weak, suggesting the key role that policy decisions (beyond just those that boost growth generally) and other factors (such as human capital) play in shaping the distribution of growth and the evolution of poverty over time.

**Figure 23: Growth elasticity of poverty**

![Graph showing growth elasticity of poverty](image)

Source: World Bank, World Development Indicators Database. Notes: The 6 countries with the highest and lowest growth elasticities per capita, as well as those whose per-capita GDP is growing at over 7.5% per year are labeled.

Findings from the World Bank’s Kenya and Gender Poverty Assessment suggest that the decline in poverty between 2005 and 2015 was underpinned by a pattern of consumption growth that was concentrated among the poorest 40 percent of the population. For example, consumption growth among the poorest 40 percent of the population increased at an annualised rate of 2.9 percent per year compared to 1.1 percent for the population overall. The highest rates of consumption growth for the bottom 40 percent occurred in Coast (4.5 percent per year) and Eastern province (4 percent per year) and the lowest in Nairobi (1.3 percent per year).

At the same time, the share of consumption spent on food rose by 3.3 percentage points (food prices rose faster than non-food prices), from 51 to 54.3 percent between 2005 and 2015 and the share of consumption on non-basic goods (everything other than food, rent and energy) declined from 35.7 to 30.3 percent of total expenditure. The budgets of urban households in particular seem to be under the greatest pressure, with non-basic consumption expenditure falling from 40.9 to 30.9 percent. Despite lower and more volatile GDP growth in the agricultural sector, almost all of Kenya’s 10 percentage point reduction in poverty (46.8 to 36.1 percent from 2005 to 2015 benchmarked against the national poverty line) was a result of improvements in earnings in rural areas, where poverty rates fell from 50.5 to 38.8 percent. Empirical evidence suggests that declines in rural poverty were attributable to increased diversification of rural household incomes as well as higher agricultural incomes. Despite the fact that around 70 percent of Kenyan households derive some income from agricultural activity, very few households in Kenya remain exclusively dependent on it: between 2005 and 2015, the share of households deriving all of their
income from agriculture declined from around 14 to 3 percent. Analyses in the Poverty Assessment examining the contribution of different sectors to poverty reduction find that households deriving at least 50 percent of their income from the agricultural sector accounted for just over a third of total national poverty reduction while households deriving at least 50 percent of their income from the services sector (both from wage employment and off farm self-employment) accounted for another 30 percent of poverty reduction.

Another analysis that grouped households slightly differently found that households with diversified incomes (those with less than 90 percent of total income deriving only from agricultural or non-agricultural sources) representing 29 percent of the population accounted one third of Kenya’s total poverty reduction between 2005 and 2015. As stated in the report:

"...An important factor in poverty reduction has been the ability of households engaged in agriculture to complement their incomes through non-agricultural activities, the ability of agricultural households to engage in petty trading, kiosk retailing, operating taxis and running local enterprises, reduces their vulnerability to climatic and price shocks, and increases their ability to generate income. (Pape et al., 2018)."

While rural incomes diversified as more individuals sought ways to earn money through non-farm business or wage work in services, the rise in food prices provided a possible additional windfall for rural households able to sell surplus food40. In the 2005-2015 period, the price of food more than doubled and the prices of maize and beans (the crops that account for 85 percent of Kenya’s cultivated land) rose above what would be estimated had their prices risen at the same rate as overall inflation. However, the extent to which higher prices benefitted farmers depends on the extent to which price gains were passed on to farmers rather than absorbed by intermediaries and this data is not widely available. National data does show, however, that there was a moderate increase in the share of own crop production sold on the market between 2005 and 2015, possibly as a result of higher prices. Households that commercialize a greater share of their crop production are less likely to be poor than households that commercialize less, suggesting the importance of reducing the transaction costs associated with market access, such as through infrastructure investments and better information flows41.

One salient shift in crop production in Kenya, possibly as a result of higher prices (relative to maize and other cereals), has been the significant increase in the share of cultivated land area devoted to beans and legumes (from 27 to 37 percent of cultivated area) between 2005 and 2015. Increased cultivation of beans could also be part of an income diversification strategy since beans have a short growth cycle and can be harvested before other long season crops such as maize. Beans are also a good source of protein, which can help improve household food security and diversity.

Since 2005, maize productivity (yields) stagnated at around 1,000 kg/hectare and continues to lag significantly behind other countries in the region such as Ethiopia and South Africa where yields are over 3,000 kg/hectare. Stagnating yields suggest that there has been little improvement in the adoption of improved farming technologies and practices that are known to be associated with greater productivity, such as application of chemical fertilizer and use of improved seeds42. Though they are used widely, two issues with hybrid maize seeds is quality (fake hybrid seeds are widespread) and regulatory hurdles (long approval times and requirements for new seed varieties and outright bans – for example of genetically modified crops) reduce the rapid introduction of modern seeds bred for specific climactic conditions or to resist pests43.

40. More generally, there is an economy wide tension between high crop prices for farmers and traders (which can potentially earn higher incomes) and non-farmers who will feel the pressure of increased prices for food staples.

41. Notable new companies such as Twiga foods are working on key challenges association with agricultural market access and organization.

42. Using pooled data from the 2000-2010 Tegemeo panel survey, analyses in the World Bank poverty assessment suggest that households that apply chemical fertilizer experience a 20.3 percent increase in maize yield and those that use improved maize seeds experience a 26 percent increase yield. Despite evidence of a causal impact on yields of using enhanced inputs, the share of households that applied chemical fertilizer did not increase substantially. Between 2000 and 2010, the share of farm households applying chemical fertilizer increased from 70 to 75 percent.

Exploring the links between finance, technology & growth in Kenya
Chapter 3
The finance and growth nexus

3.1 Theory

In “Money Changes Everything: How Finance Made Civilization Possible”, author William Goetzmann argues that finance has been an integral part of human society and development, enabling among others, exploration, the development of cities, the industrial revolution and the overcoming of key social problems such as enabling financial security for people when they can no longer work. But it has also created and exacerbated problems, such as debt, financial crises and income inequality.

Goetzmann highlights three functions which give finance power to create value for individuals and society: (1) Finance reallocates economic value through time - such as the way a mortgage shifts money to the present for the borrower and to the future for the lender; (2) it reallocates risk - such as the way life insurance shifts the financial risks of the death of the breadwinner from the household to an institution; (3) it reallocates capital - such as how stock markets facilitate the flow of investment from savers to productive enterprises or how bank loans to businesses can help expand production. Crucially, finance links to growth by reallocating economic value to the present for production.

Levine (2005) lays out five, more nuanced, functions of finance stemming from a theoretical understanding of financial arrangements as being motivated by the need for market actors to reduce the costs of acquiring information, enforcing contracts and making transactions. Specifically, financial systems: (1) Produce information ex ante about possible investments and allocate capital, (2) Monitor investments and exert corporate governance after providing finance, (3) Facilitate the trading, diversification and management of risk, (4) Mobilize and pool savings and (5) Ease the exchange of goods and services. To the extent that financial systems effectively ameliorate information, enforcement and transaction frictions they can change the incentives for savings and investment decisions and as a result economic growth. Levine further argues that for finance to be a force that supports economic growth, theory and evidence needs to explain how financial development links with productivity.

“In terms of integrating the links between finance and growth theory, two general points are worth stressing from the onset. First, a large growth accounting literature suggests that physical capital accumulation per se does not account for much of long-run economic growth (Jorgenson, 1995, 2005). Thus, if finance is to explain economic growth, we need theories that describe how financial development influences resource allocation decisions in ways that foster productivity growth and not aim the analytically spotlight too narrowly on aggregate savings.”

Some of the key theoretical mechanisms within these functions that link finance, productivity and growth outlined by Levin’s survey of the literature follow:

- **Information asymmetries and search costs (screening):** If financial intermediaries can generate better information on firms, managers and economic conditions, they are in a better position to identify the most efficient or valuable production technologies and hence allocate scarce capital to those uses. In addition, if financial intermediaries can identify entrepreneurs likely to discover new production techniques, they can also boost the rate of technological innovation.

- **Corporate governance:** To the extent that shareholders and creditors effectively monitor firms and induce managers to maximize firm value, this will improve the efficiency with which firms allocate resources and make savers more willing to finance production and innovation. In practice, there are important barriers that prevent effective oversight,

44 Goetzmann includes a fourth key element of finance: which is that it expands the access to and complexity of the first three reallocations (of economic value through time, of risk and capital).
including the high cost of monitoring managers - especially for small shareholders - who often have great discretion over the flow of information. Another theoretical perspective is the potential sensitivity of international capital flows with respect to the ability of financial systems to exert corporate control. If sensitivity is high, it could lead to a case where capital flees capital scarce countries to capital abundant countries, even if the marginal product of capital is lower because investors recognize that their actual returns depend crucially on the quality of monitoring by intermediaries.

- **Risk:** Because savers tend to be risk-averse and high-return projects tend to be high risk, financial markets that help savers diversify risk (cross-sectionally) can induce a greater allocation of resources towards projects with higher expected returns (or innovation potential), having positive repercussions for growth. Potential investors can also face uncertainty or significant costs in their ability to convert financial instruments to purchasing power which can suppress the long-run commitment of capital. Financial markets that ease liquidity risks and frictions can induce greater allocation of resources to long term, high-return projects, and thus foster growth. Several scholars have argued that liquid capital markets ignited growth in 18th century England during the industrial revolution. Liquid assets like bonds, equity and demand deposits helped raise long term commitments of capital for industrial applications.

- **Pooling:** Financial systems that are more effective at pooling the savings of individuals can affect economic development by increasing savings, exploiting economies of scale, and overcoming investment indivisibilities. Besides the direct effect of better savings mobilization on capital accumulation, better savings mobilization can improve resource allocation and boost technological innovation. Without access to multiple investors, many production processes would be constrained to economically inefficient scales. Furthermore, many endeavors - particularly those in manufacturing - require an enormous injection of capital that is beyond the means or inclination of any single investor. This is not just about high savings rates, but about the ability of the financial sector to pool sufficiently large resources together.

- **Exchange:** Financial arrangements that lower transaction costs (the classic case is money, a more modern case in Kenya is mobile money) can promote greater exchange, greater exchange promotes specialization and specialization in turn promotes innovation and productivity growth.

- **Human capital:** In the presence of indivisibilities in human capital investment and imperfect capital markets, the initial distribution of wealth will influence who can gain the resources to undertake human capital augmenting investments. In particular, financial arrangements may facilitate borrowing for the accumulation of skills. If human capital accumulation is not subject to diminishing returns on a social level, financial arrangements that ease human capital creation help accelerate economic growth.

- **Occupational choice and inequality:** A few theoretical perspectives argue that information asymmetries produce credit constraints that are particularly severe for the poor because they do not have liquid savings to fund their own projects or collateral to access bank loans which in turn restrict the poor from seizing investment opportunities. If financial development ameliorates information and transaction costs that foster greater external financing of low-income entrepreneurs (or to a larger share of the population more generally), it can have a direct impact on poverty and growth. Banerjee and Newman (1993) set up a model that explores the implications of credit market imperfections and inequality on the process of economic growth through the dynamics of occupational choice:

> “Because of capital market imperfections, people can borrow only limited amounts. As a result, occupations that require high levels of investment are beyond the reach of poor people, who choose instead to work for other, wealthier, employers; thus wage contracts are viewed primarily as substitutes for financial contracts. Depending on labor market conditions and on their wealth, other agents must become self employed in low scale production or become idle. The pattern of occupational choice is therefore determined by initial distribution of wealth, but the structure of occupational choice in turn determines how much people save and what risks they bear. These factors then give rise to the new distribution of wealth.”
One of the key findings of Banerjee and Newman’s model is that relatively minor differences in initial conditions of inequality in a setting of credit market constraints can matter both to the long-run equilibrium of living standards (prosperity vs. stagnation) and to the prevailing mode of production (self-sufficient farmers and cottage industry vs. entrepreneurial and factory production). They offer a historical parallel to the latter finding:

“... England and France, which in terms of the level of development were roughly comparable at the middle of the eighteenth century and yet went through radically different paths of development. England went on to develop and benefit hugely from the factory system and large-scale production, whereas France remained a nation of small farms and cottage industries for the next hundred years.”

3.2 Global evidence and narratives

Economists have long debated the nature of the nexus between finance, growth and development, but there now seems to be a consensus underpinned by empirical research that suggests a strong positive link between the functioning of the financial system and long-run growth. The nature of the empirical evidence stems from a wide range of studies that differ methodologically, from cross-country studies, to panel and time-series studies, to industry and firm level analyses. Below is a summary of some of the studies surveyed in Levine (2005), Demurgic-Kunt (2012) and Beck (2011).

Early investigations (e.g. Goldsmith, 1969) into the link between finance and growth were limited for several reasons: they only used data on a small number of countries, they did not control for other factors influencing growth, they did not examine the link between finance and the intermediate factors that drive growth such as productivity growth and capital accumulation, they only used narrow measures of financial development - primarily the size of financial intermediaries (e.g. bank assets expressed as a share of GDP), they did not account for the possibility of reverse causation and they did not explore the differential effect of financial intermediaries (e.g. banks) and markets (e.g. equity markets) on growth.

A second wave of studies incorporated several methodological improvements. King and Levine (1993), for example, examine the relationship between three measures of financial development: liquid liabilities of the financial system as a share of GDP (a measure of the system’s size), bank credit as a share of total credit from commercial banks and the central bank (a measure of the degree to which the central vs. commercial banks allocate credit) and private sector credit as a share of GDP (a measure of the degree to which savings flow to firms vs. government or state-owned enterprises); and three measures of growth: average rate of real per capita GDP growth, the average rate of growth in the capital stock per person and total factor productivity growth.

Using data from 77 countries the authors find a strong positive and economically meaningful relationship between each measure of financial development and each measure of growth, controlling for a host of other factors (such as human capital, trade openness and fiscal and monetary policy). Other studies added indicators of stock market liquidity (turnover ratios) as a measure of the degree of trading frictions and information, finding a positive link between initial levels of stock market liquidity and banking development with future rates of economic growth, capital accumulation and productivity growth.

However, these initial studies did not formally address causality and could be biased by simultaneity and the hidden effects of unobserved country-level factors associated with financial system development. To address these issues, further studies incorporated the use of panel data and instrumental variables and found first order effects between finance and growth consistent with the earlier literature. Additional inquiries look at the experiences of single countries, industries or firms over time, sidestepping some of the methodological challenges facing cross-country studies using aggregated data.

For example, Jayaratne and Strahan (1996) empirically find that intrastate bank branch reform in the United States in the 1970s boosted the quality of bank lending (not quantity) and accelerated real per capita income and output growth. Others (Demirguc-Kunt, Rajan and Zingales, 1998) explore the hypothesis that firms (or industries) that are less able to finance themselves from retained earnings should grow faster than those more able grow with internal resources if credit constraints are ameliorated through financial development. These studies find that greater financial development is associated with faster firm (industry) growth, especially those that are naturally more dependent on external finance.

Another line of research examines the relationship between financial innovation, technology and growth.
Laeven et al (2015) motivates the development of a theoretical model examining whether financial innovation is necessary for sustaining economic growth on two observations. The first, is that technology and finance have evolved together. For example, specialized investment banks and accounting systems were invented to finance the construction of vast rail networks and more recently, venture capital firms were created to screen high technology start-ups. The second, is the evidence from empirical studies suggesting a strong connection between finance and technological innovation.

While examples of the ‘bright’ side of financial innovation are evident in history, the 2008 financial crisis and severe recession that followed, made salient the ‘dark’ side of financial innovation (Beck et al, 2013). In the run up to the 2008 crisis, mortgage-backed securities designed to transfer credit risk were perceived to be safe but exposed the system to neglected risk, in the process helping to fuel the expansion of credit and housing prices. More egregiously, Henderson and Pearson (2011) find evidence that financial innovations helped financial intermediaries exploit investors misunderstandings of financial markets.

Using the banking industry’s business enterprise research and development (R&D) expenditure as a proxy for financial innovation in 26 OECD countries, Beck at al (2013) find evidence for both the ‘bright’ and ‘dark’ sides of financial innovation. On one hand they find that in periods with higher industry-level growth opportunities (as proxied by price-to-earnings ratios of listed companies in 35 sectors), countries with more intense financial innovation grow faster (in terms of GDP per capita and real capital per capita). They also find that a higher level of financial innovation is associated with the growth of industries that rely more heavily on external financing and that depend more on R&D activity themselves. On the other hand, they find that financial innovation is associated with more volatility among industries that rely more heavily on external financing and fragility among banks. Motivated by the numerous innovations in financial inclusion and cross-border banking, Bara et al (2016) conduct a similar empirical study to examine the relationship between financial innovation and Economic growth among countries in the Southern Africa Development Community (SADC) and find a weak, but not causal, positive association between financial innovation (both broadly defined and using mobile money and banking penetration) and long run economic growth.

In depth country and regional case studies have also shed light on the mechanisms that link workings of the financial system with growth. For example, in portraying the development of a modern financial system in the United States as fundamental to its transformation from an agricultural society to an industrial powerhouse, Wright (2002), documents instances of how financial arrangements emerged to solve specific transaction and information costs such as how corporations increasingly required managers to hold stock to align personal interests with those of the firm and how bankers learned to monitor, incentivize and restrict borrowers (e.g. through covenants) to lower default rates and improve resource allocation.

Focusing on Asia, Studwell (2015) compares and contrasts the development experience of Asian countries in the 20th century and concludes that a distinguishing feature of the region’s most successful countries (Japan, Taiwan, Korea), was the ability of governments to resist early deregulation of the financial sector in order to retain control over how the country’s scarce supply of capital was put to use. This ensured that the financial sector was aligned with national development goals and in particular was harnessed to support agricultural output and manufacturing policy, often by “sacrificing short term efficiency considerations for long-run developmental gains in the form of technological learning”. Studwell makes the case that the importance of finance coming second to state-directed industrial policy in the early stages of development was also consistent with the experiences of the US and Europe in the 19th century:

“Infant industry policy required that funds be directed to industrial projects that were less immediately profitable than either other potential manufacturing investments or consumer lending. Banks were therefore kept under close control. International inflows and outflows of capital were also strictly limited so that domestic capital remained under state control and unregulated flows of foreign funds did not disrupt developmental planning. And the returns citizens could earn on bank deposits and other passive investments were frequently crimped, increasing the surplus left at the financial system’s disposal, which could then be used to pay for development policy and infrastructure. This amounted to a hidden taxation, which was tolerated by people in these societies because they could see the transformation taking place all around them.
South Koreans, for instance, put up with negative real interest rates on bank deposits because they saw their economy overtake first North Korea, then the south-east Asian states, then even Taiwan in only three decades."

Evidence of the ability of financial services to reduce poverty in lower income countries (through the theoretical stance that credit constraints create a poverty trap) stem largely from empirical studies on the impact of microcredit. In one of the definitive papers assessing the impact of microcredit (Banerjee et al, 2014), relaxing credit constraints did not result in higher household incomes for micro-entrepreneurs on average45, but a re-examination of that evidence found that for a particular group of households who were already running a business before accessing microcredit, the effects on business revenues and asset accumulation were positive, leading the authors to conclude that “For talented but low-wealth entrepreneurs, short-term access to credit can indeed facilitate escape from a poverty trap” (Banerjee et al, 2019).

The World Bank’s Global Findex program which repeatedly measures access to financial services consistently and comparably across countries provides an opportunity to assess the wider relationship between access to financial services and poverty reduction. The available data, however, suggests that there is no correlation between average rates of growth in access to accounts and changes in the poverty rate. There are likely several reasons for this, but perhaps most importantly is that rather than exerting large direct influence on income or consumption growth, access to accounts generates benefits that aren’t be picked up by poverty measures (such as an improved ability of households to manage liquidity or cope with shocks) at least in the short run (Figure 24).

Figure 24: A cross-country relationship between greater financial inclusion (measured by adoption of accounts) and poverty reduction is not evident in the data so far.

Source: World Bank, World Development Indicators Database and Global Findex Database. Notes: Only countries with initial poverty rates greater than 15% are shown. The 6 countries with the highest and lowest growth elasticities per capita, as well as those whose per-capita GDP is growing at over 7.5% per year are labeled.

45. More generally, six randomized evaluations conducted on four continents between 2003 and 2012, led by IPA- and J-PAL affiliates, found that microcredit had some benefits, such as expanding business activity, but did not reduce poverty or lead to empowerment for women on average. For a review see: https://www.poverty-action.org/impact/evidence-microcredit-rethinking-financial-tools-poor
3.3 Financial sector development and its relationship to growth in Kenya

Major developments in Kenya’s financial sector have been concentrated in banking and payments while capital markets (with the exception of private equity), pensions and insurance have been less dynamic (Box 3, Figure 25). By using digital technologies and agent networks to lower the cost of delivering and accessing accounts, payments and loans, the financial sector significantly broadened its reach and size. While Safaricom has become a market leader in digital payments with the introduction of M-Pesa in 2007, banks and a growing number of fintech companies are leveraging mobile money and other technologies (such as smart phones and machine learning) to develop new ways of offering services and compete for depositors, borrowers and payments.

Critical to these developments were engaged regulators, who adopted a “test and learn” approach with respect to new innovations and built their capacity to understand digital technologies (Ndung’u, 2019). Despite there not being a regulatory framework applicable to mobile money, after an audit of the legal, operational and money laundering risks of the M-Pesa system, the Central Bank of Kenya (CBK) issued a “letter of no objection” paving the way for Safaricom to launch the product in March of 2007 (Alliance for Financial Inclusion, 2010). In 2009, Kenya’s banking act was amended to allow banks to recruit third parties to offer select banking services, paving the way for banks to develop agent networks to reach into underserved or more remote communities. The fact that financial service providers that do not take deposits are not regulated and do not require a license to operate, left the door open for credit-only providers offering digital loans to consumers over their mobile phones to enter the market. The government itself has launched a number of initiatives that leverage digital technologies and digital finance to improve tax, social protection, pension and NHIF payments, among others (Ndung’u, 2019).

While financial innovation for inclusion is a defining feature of the financial sector in Kenya, domestic lending to the private sector has not grown significantly and credit allocation to potentially strategic sectors remain low as a share of the overall lending portfolio. For example, agriculture and tourism, two important sectors from an output, employment and comparative advantage standpoint (in the latter case) only received 6.2 percent of bank lending though they account for...
over one third of GDP (Figure 25). This likely reflects a combination of high transaction costs to intermediation in sectors more sensitive to domestic and international shocks, scarce or unreliable historic data on which to assess risk (especially where informal firms dominate) and higher or safer perceived growth and profit opportunities in other sectors. Instead, commercial bank lending is primarily channeled for personal and household uses (25.1 percent of gross loans in 2017), trade (19.3 percent) and real estate (16 percent). With the exception of real estate, which has risen significantly in importance in the loan portfolio, the composition of bank lending by sector has not significantly changed since 2009. After 13 years in which the quality of the banking sector’s loan portfolio improved, the share of non-performing loans (NPLs) in the portfolio neared 13 percent in 2017. The recent deterioration in the quality of lending, derives primarily from the poor performance of loans in four sectors: trade, manufacturing, building and construction and real estate (Figure 26).

Figure 25: Select indicators of financial development in Kenya

Select financial sector development indicators, Kenya, 2000 – 2016

The global relationship between financial sector development and GDP per capita (2016)

With the objective of reducing the cost of lending, a law establishing caps on interested rates was introduced in 2016. These caps were among the most drastic ever enacted globally and created some adverse unintended consequences, including a decline in bank credit to small- and medium-sized firms especially in trade and agriculture, a reduction in the lending activity and profitability of small banks, reduced monetary policy effectiveness and an estimated reduction in short run economic growth of around 0.5 percentage points per year (IMF, 2018).

**Figure 26: The distribution of commercial bank lending by sector (gross loans and non-performing loans)**

The Nairobi Stock Exchange (NSE) is Africa’s fifth largest by value. But between 2003 and 2017, there were only 10 IPOs (and only 2 since 2013 that raised a total of USD 42 million). And since reaching a high of near 40 percent of GDP when Safaricom was listed in 2008, stock market capitalization as a share of GDP has since fallen to 25 percent. To counter the lack of interest in listing, in 2013 the NSE launched the Growth Enterprise Market Segments (GEMS) to provide SMEs with more financing options and in 2016 the Capital Markets Authority reduced listing fees. These efforts have largely fallen flat. Even though GEMS tailored listing requirements to smaller and younger companies, to date, only six firms have ever listed on the GEMS junior board. And while the direct costs of listing have gone done, the poor historical performance of IPOs and NSE’s performance more generally continue deter listings (the NSE 20 index has fallen by 44 percent since 2010) (Divakaran et al, 2018).

In the past ten years, Nairobi has become a hub for private equity (PE) and venture capital (VC) funds seeking investment opportunities in Kenya and the region, providing alternative sources of investment for SMEs, early stage and high growth companies. Kenya is now the third largest source of PE transactions in

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46 As of October 2019, listed firms in the NSE have a market capitalization of around USD 24 billion. Sixty-four companies are listed in the NSE of which 40 percent are banks, insurance or investment service firms, an additional 40 percent are roughly evenly distributed between firms in the agricultural, manufacturing, energy and construction sectors and nearly 20 percent are service sector firms.
Sub Saharan Africa, behind South Africa and Nigeria and accounts for a dominant majority of the deal flow and value in East Africa. In 2017 and 2018, the total cumulative value of PE deals in Kenya approached USD 1.2 billion (making up 87 percent of the total for East Africa) - by comparison in 2017 total commercial bank lending reached approximately USD 21 billion. While PE investments in Kenya span a diverse range of sectors, the financial services sector (fintech), agribusiness and FMCG dominate (KMPG and EAVCA, 2019). In 2017-2018, some of the largest deals were in financial services, including a USD 150 million loan from the International Finance Corporation (IFC) to Coop Bank intended to expand its lending operations to the micro, small and medium sized enterprises segment; a USD 70 million Series B investment by IFC Venture Capital group and others in Branch international (a mobile branchless bank with operations in Africa that offers consumer credit through its app); a USD 55 million investment by AfricInvest (a pan-African private equity firm) in Britam (one of East Africa’s largest financial services groups); and a USD 47.5 million Series C investment by The Rise Fund to Cellulant (a digital payments service provider).

Closely orbiting PE/VC funds are Development Finance Institutes (DFIs) which also execute private equity deals, impact investing firms (which emphasize social and environment returns over commercial returns) and a number of accelerators and business advisory firms that work with entrepreneurs and provide small amounts of capital, mentorship and access to investors. Taken together, there is an increasingly rich ecosystem of investment, technical assistance and advisory support for entrepreneurs in Nairobi. This ecosystem, however, is not without its critics. Among the concerns are that western-linked start-ups are favored for funding over local teams, potentially hobbling the prospects of homegrown African tech. A 2018 study by Village Capital found that 90 percent of start-up funding went to foreign founders.

If part of this problem stems from the fact that the PE/VC industry predominantly fundraises from international investors and DFIs, part of the solution will be greater presence of local capital in the financing of new tech companies. One of the key constraints to the growth of the PE/VC industry in Kenya has been the lack of local institutional investors, namely pension funds and insurance companies. In 2015, the assets under management of Kenya’s pension fund industry were USD 7.8 billion, but less than 1 percent were invested in PE funds. While changes to pension fund investment guidelines by the Retirement Benefits Authority (RBA) in 2015 increased the amount pension funds can invest in PE from 5 to 10 percent of assets, a host of other barriers remain, including fragmentation in the pension fund industry, lack of familiarity among pension fund trustees with the PE/VC asset class and the significant amount of time and legwork required by PE fund managers to raise money from local institutional investors relative to other sources of capital. Participation in PE/VC investment by the Kenya’s insurance industry is even more limited. Investment guidelines issued by the Insurance Regulatory Authority (IRA) offer no specific guidance on PE investment, other than setting ‘concentration limits’ of 5 percent on foreign investments. Since many PE funds are not registered in Kenya, insurance providers wanting to invest would have to do so through “feeder funds” registered by the PE/VC fund locally (Divakaran et al, 2018).

How are the developments in Kenya’s financial sector connected to the trajectory and drivers of recent economic growth? To what extent has finance played a role in shaping the distribution of the benefits delivered by that growth? Unfortunately, these questions are not easy to answer and the literature examining the systemic effects of Kenya’s financial sector development and innovation is thin, so more definitive answers will depend on how the evidence accumulates going forward. Nonetheless, without an evaluation of the financial sector’s role in Kenya’s current growth trajectory, it will be difficult to identify how the financial sector might best support Kenya’s ambitions to become a middle-income country and, in the process, transform the living and working contexts for a majority of Kenyans.

In broad brush strokes, the available evidence from household surveys and analyses of macroeconomic


48. See for example Financial times article “Are tech companies Africa's new colonialists?” for an overview of the criticism: https://www.ft.com/content/4625d8b8-9c16-11e9-b8ce-8b4599e04726

49. Divakaran et al (2018) explore other key constraints facing the PE/VC industry in Kenya, namely the regulatory, legal and taxation frameworks that, for example, disincentivize investors from registering their funds locally.
data reviewed in Section 2.2 suggest two features of recent growth: The first is that economywide labour productivity (and average incomes) has been growing relatively slowly since the early 2000s in Kenya compared to economic and regional peer countries. The second, is that two important channels are driving that growth. The first is the “structural” channel resulting from movements of labour from sectors with low to high productivity. The second is the “technology” channel resulting from improvements in productivity within sectors (Figure 27). However, rather than the deep structural shifts that were evident in industrializing economies as labor moved from a small scale “traditional” mode of production (subsistence farming) to a large scale “modern” mode of production (factories), Kenya’s current structural channel of growth can be characterized as an incremental shift within “self-sufficient” modes of production: from small scale farming to small scale self-employment activities in the services sector, which is offering rural families a tentative foothold out of poverty. Similarly, the within-sector channel of labour productivity growth has been evident mainly in modern services (ICT and financial services) which employ relatively few people, not in manufacturing or agriculture. Finally, while large investments in physical infrastructure (such as roads, rail and energy generation and transmission) that have the potential to boost economywide productivity have begun to materialize in the past few years, the evidence suggests only a limited role of capital accumulation on growth since the early 2000s and by most accounts Kenya’s infrastructure deficit remains significant. The following paragraphs examine the first two of these channels in turn, exploring the role of finance in each.

Figure 27: Kenya’s growth channels
Exploring the links between finance, technology & growth in Kenya

Growth channel 1: Rural households transition away from farming

Almost all of the improvements in real consumption between 2005 and 2015 occurred in rural areas largely as a result of the incorporation of more non-farm activities in household earning strategies. Available evidence suggests that it is likely that peer to peer mobile payments, mobile savings options and mobile communications technology are intertwined in this dynamic. In some ways, with the expansion of mobile network coverage, mobile phones and agent networks, rural households in Kenya are less isolated than they were before and more able to gather information and raise moderate financial capital (for example through better savings options and remittances) to aid in the transition from farm work to non-farm microbusiness. As suggested by the evidence in Suri and Jack (2016), these developments seem to have been particularly important for women, who - as primary caretakers (and quite often heading single-parent households) have less time and resources to access banks - perhaps could benefit disproportionally from the convenience and proximity of mobile money agents and the services available on a mobile handset. In addition, finance does seem to have played a role in technological change for lower-income households in rural areas by facilitating the purchase of moderately-valued assets - in particular motorbikes and solar panels. And in the latter case, the benefits are unlikely to show up fully in measures of consumption or poverty. However, given that bank loans to agriculture (as a share of overall bank lending) are falling and now make up less than 4 percent of commercial banks’ lending portfolio and only 3 percent of rural adults have ever accessed a traditional bank loan (FinAccess, 2019), suggests a very limited role of the banking system in facilitating capital investment in rural areas. Savings and credit cooperatives (SACCOs) and savings groups (chasas) are more ready sources of higher value loans (Figure 28), particularly for education, which are either the first or second most common use of these loans (35 percent of SACCO loans and 25 percent of chama loans are used for education).

Figure 28: Loans used among adults in rural areas are primarily sourced from shopkeepers, social networks and digital lenders (mobile banking or apps) for day-to-day household needs. Chamas and SACCOs or MFIs provide higher value loans which are

Lending landscape in rural Kenya

Average size of loan vs. percent of loans currently in use, by lender

Reference prices

Source: 2019 FinAccess household survey (which recorded a total of 7,668 loans currently in use). Notes: Reference prices for Petrol, Electricity and Maize grain were obtained from the 2019 Economic Survey. The average price for a used 150cc motorbike (eg. Boxer) was estimated from online classifieds. The out-of-pocket secondary day school term fee was obtained from the Kenya Ministry of Education.
Growth channel 2: A modern technology-led services sector grows

Macroeconomic analyses of the drivers of labour productivity in Kenya identify that productivity improvements within its non-agricultural sector have been important. The rise of modern companies in ICT and finance, such as Safaricom and Equity bank and more recently tech start-ups like M-Kopa, reflect a growing convergence between technology and the finance, and the remarkable vision and innovation within those companies to create business models and products that enabled them to tap into a large, but largely low income, mass market. The seeds of this productivity growth were the investments in cellular network infrastructure and the undersea fibre optic cables that lowered the cost and increased the speed of internet access, providing a key ingredient for a digital economy to emerge. While donors played an important role in financing the exploratory stages of early innovations (most prominently M-Pesa), a private equity and venture capital (PE/VC) industry is emerging to screen and finance start-ups, SMEs and growth firms which are developing and deepening consumer and business applications in service industries that leverage on Kenya’s digital infrastructure and entrepreneurial energy. The long-run impact of this ecosystem will likely be maximized if domestic sources of capital can be mobilized to help fund it (primarily pension funds and insurance companies) and if the know-how of screening and supporting the growth of viable, modern technology firms is transferred from foreign investors and founders with valuable international experience to local investors and entrepreneurs. From an economywide perspective, the challenge is that the good jobs that are being created in the fastest growing service sub-sectors (financial services and ICT) are skill-intensive (requiring significant investments in education) and are relatively low in number. It remains to be seen whether other technology and service-sub sectors such as media, e-commerce, tourism and transportation can expand good employment opportunities enough to strengthen the “structural” growth channel and absorb larger shares of Kenya’s labor force.

Kenya’s missing growth channels

While within-sector productivity in modern services is growing and new-technology firms are sources of innovation, the manufacturing and agriculture sectors have been much less dynamic. In agriculture, there has only been a moderate increase in the adoption rates of chemical fertilizer and improved seed, and productivity in key household crops such as maize has not improved. Many of the largest Kenyan manufacturing firms either pre-date independence or were established when Kenya was actively supporting industry shortly after independence50. Lacking dynamism, the private manufacturing sector only created a net of 94 thousand jobs between 2000 and 2017, at a time in which the workforce expanded by over 10 million. As a result, the structural channel of productivity growth has been relatively weak: there are few good wage-earning opportunities for low-skill workers in the labor market. In other settings, those jobs have been provided by factories. The relative scarcity of low-skill wage work perhaps helps explain why education is an increasing priority for families across Kenya who are making significant effort and financial sacrifices to put children through school, but this also means that the competition for jobs, even among Kenya’s most highly educated workers, is intense. One recent example of this are reports of “essay-mills” in which Kenyan ghost writers are paid to write essays for university students in the United Kingdom51.

50. For example: East African Breweries (est. 1922), Bamburi cement (est. 1951), Athi River Mining/ ARM Cement (est. 1974), Chandaria Industries (tissue and hygiene products, est. 1964), British American Tobacco Kenya (operations in Kenya established in 1907), RAMCO Group (est. 1948). Source: “Manufacturing in Kenya

Chapter 4

Discussion

Many of Kenya’s economic dynamics might be characterized as a bottom-up response to long standing market or government failures. As agriculture fails to provide a secure financial footing, farming families have turned to other sectors or cities in pursuit of stability and opportunity.

As formal financial intermediaries fail to effectively pool and reinvest savings in communities, people continue to come together in semi-formal savings and investment groups to provide financial solutions for themselves. In the absence of a convenient and reliable payments system for a mass market routinely sending cash to members of their social network over large distances, a telecommunications company had a “Eureka” moment, leaving banks scratching their heads. While the government works to raise the quality of schools, private providers are stepping in to accommodate demand for alternatives. In places where government was slow to improve road networks or public transportation options, independent motorbike operators are providing mass transportation solutions over rough terrain. As firms fail to grow, insufficient numbers of jobs are created for a burgeoning and increasingly educated labour force and young people are “hustling” and creating jobs for themselves (Well Told Story, 2017).

While there is much to be admired and fostered in the energy and enterprise of Kenya’s private sector led economy, there are limits and challenges to this dynamic. High rates of migration to Kenya’s primary and secondary cities has contributed to crowding, the growth of informal settlements, housing shortages, stagnant urban incomes and poverty (Pape et al., 2018). Unchecked growth in the fleet of motor vehicles will lead to congestion, pollution and increased traffic-related injuries. Financial innovation without consumer protection and appropriate regulation could erode some of the benefits that Kenya has achieved in financial inclusion. If out-of-pocket fees prevent access to good schools for the poorest children, a rise in private schooling could create a two-tier education system that fosters inequality. Informal wage jobs or self-employment in the services sector, while providing families with a rung out of poverty or a fall-back option in the event of a shock, may offer only limited opportunities for upward mobility.

Decades of under-investment in fundamental infrastructure - such as road networks and energy - have created significant unmet needs and pain points in Kenya’s economy for both households and firms. Without these investments - and wider diffusion of appropriate technologies, know-how and external capital - there is only so much people and firms can do for themselves. The evidence
that economy-wide labour productivity has not grown rapidly reflects this.

There are, however, promising developments. Government and foreign direct investment are increasing Kenya’s energy production capacity, modernizing its rail network and expanding its road network. Together these initiatives have the potential to lower the costs of trade and could help increase the incentives for investment in manufacturing and help lower food costs. In addition, social protection programs are covering more of Kenya’s poor and voluntary participation in the government’s national hospital insurance fund (NHIF) has increased notably in the past ten years, rising from 1.8 to 19.2 percent of non-employed, non-pensioned adults between 2009 and 2019 (FinAccess 2009, 2019). If greater access to social protection and insurance can limit the erosion of liquid savings, accumulated wealth or exhaustible social network resources to cope with common shocks, households will have more resources for investment in human capital and livelihoods.

Kenya’s 21st century growth story begins with strategic investments in broadband internet and mobile networks that unleashed a wave of growth and innovation in Kenya’s ICT and financial sectors which yielded tools and technologies that are being leveraged by start-ups and established firms in other sectors for further innovation and value creation. Pay-as-you go asset financing enterprises such as for solar panels are one example of how new forms of finance are emerging that enable lower income households to access technologies that boost living standards. But while ICT and finance have become highly productive pockets of Kenya’s economy, together they are creating around 9,000 private sector wage jobs per year, far fewer than is necessary to absorb substantial shares of Kenya’s larger low-skilled labour force. Furthermore, financial sector lending is heavily focused on consumer finance and real estate and recent financial innovations that have scaled are also focused on consumer lending. On one hand financial sector innovation and the regulatory stance that has enabled it, have been critical to Kenya’s success in expanding financial services to people. On the other, it is unclear the degree to which financial innovation is supporting productivity gains in the country more broadly and some of the risks of a ‘laissez-faire’ approach to innovation are emerging, including concerns over debt and consumer protection.

If broader financial development, alongside policy, is geared towards helping farm households and firms exploit available technologies and develop know-how to develop production capabilities – it could provide a more potent boost to agricultural output, rural incomes and aggregate demand on one hand while creating larger numbers of opportunities for productive employment through firm growth in modern services and manufacturing on the other.

This may require a renewed focus on developing the core functions of finance that can help mobilize domestic sources of capital for investment: reducing information asymmetries, fostering good governance, pooling and allocating capital for long-run projects in key sectors, easing transaction costs and providing savers and investors with ways to mitigate risk. It may also require the financial sector to work alongside government to identify and reduce regulatory hurdles that dampen innovation and the more rapid spread of already available technologies in other sectors, such as agriculture. It is also worth considering whether a shift in values or incentives is needed in the financial sector, lead less by short-term profits and more by a longer-run perspective more aligned with Kenya’s national development goals and the difficult task of building new production capabilities. While the government has a critical role in investing in public goods and human capital, should it also consider policy instruments or institutional arrangements that can help create incentives in the financial sector for mobilizing and channeling domestic capital to strategic sectors or population segments?

Finally, the intention of this note is not to prescribe specific courses of action, but to encourage readers to consider the theory and evidence for how finance can drive inclusive growth and take that thinking forward in debate and action.
References


Road-Ahead


Exploring the links between finance, technology & growth in Kenya

About FSD Kenya

The Kenya Financial Sector Deepening (FSD) programme was established by the UK’s Department for International Development (DFID) programme in 2001 to support the development of financial markets in Kenya. In 2005 we were constituted as an independent trust under the supervision of professional trustees, KPMG Kenya, with policy guidance from a Programme Investment Committee (PIC). Our aim today is to help realise a vision of an inclusive financial system to support Kenya’s goals for economic and social transformation. We work closely with government, financial services industry and other partners across key economic and social sectors. The core development partners in FSD Kenya are currently the Bill and Melinda Gates Foundation and the Swedish International Development Agency (SIDA).

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