

Conceptual framework for assessing value in the digital economy in developing countries

Background paper for the UNCTAD Information Economy Report 2019

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1) Introduction

As the digital economy expands into developing countries it is becoming important to assess the impacts it is having. This is especially important with the discussion of not only positive impacts emerging in the digital economy but also disbenefits to workers, to firms and potentially more broadly to economies. The concept of value in the digital economy is one way to better assess these impacts, by providing a perspective on the impacts, across different components of the economy and over the short and the longer term.

This paper sets out to expand on this idea of value in the digital economy. Given that the digital economy is often defined imprecisely, section two explores the definitions of the digital economy to provide a clear scope for analysis. With a particular emphasis on developing countries, section three highlights some of the varied impacts of the digital economy and how these pose challenges for assessing positive and more problematic outcomes, particularly when both types of outcomes may occur together.

Responding to this challenge, we develop a conceptual framework of value highlighting four key elements that are important to explore, the division of value, governance of value, upgrading, and creation vs capture of value that can be useful in assessing value in the digital economy. Through an analysis of three key trends in developing countries around platformization, e-commerce and digitalization we use this framework to assess how the digital economy is changing value. Specifically, we highlight new forms of value being created, particularly around platforms and data. Increasingly smaller firms and individuals find themselves under ever more granular control which can lead to reduced skills development and ability to upgrade. However, new forms of value creation, through value chain entrance, e-commerce and within data rich interactions with customers offer potential directions for improvement value creation in the future. The expanding digital economy also poses threats to those firms and individuals left behind, outside these processes of change. As the digital economy becomes central to value creation, it becomes crucial that actors are able to integrate with, and have the skills to use digital technologies across roles and sectors.

2) The digital economy

The notion of the digital economy has become commonplace to describe how digital technology is changing patterns of production and consumption. While the geographic focus of the digital economy was initially about leading digital nations, there has been a growth in interest in exploring digital economies in

developing countries as these processes become more relevant (Graham et al. 2017, Manyika et al. 2014, Ojanpera et al. 2016).

It is worth revisiting the concept of the digital economy in detail to set out the scope of work and investigate if this term is relevant to understanding the impact of digital on economies from a developing country perspective.

2.1. Evolution of the digital economy

Since the digital economy was first coined in the mid-'90s, this concept has been marked by shifting definitions, related to the “rapidly changing nature of technology. What is relevant one day might be obsolete the next as businesses and consumers adopt new technologies to perform tasks and communicate”(Barefoot et al. 2018 p.6). In this section, the evolution of the digital economy is explored, highlighting three periods:

- Linked to the concept of the “Internet economy” (1995-mid 2000s)
- Emphasis on the ICT and digital sector (mid-2000s-present)
- Emphasis on the concept of digitalisation (2010- present)

The concept of the digital economy originated during the late 90's and was initially concerned with internet adoption and early thinking about its impacts upon economies (sometimes termed as the ‘internet economy’)(Brynjolfsson & Kahin 2002, Tapscott 1996). As the internet expanded to facilitate new economic sectors and digital innovation, a growth of reports from the mid-2000s onward expanded to focus on the conditions under which the internet economy might emerge and grow. Thus, definitions evolved to include the analysis of different policies and digital technologies on one hand, and the growth of ICT and digitally orientated firms as key actors in the digital economy on the other (OECD 2014, OECD 2012). As internet connectivity has grown in developing countries, and consequently the range of digital firms, products and services have expanded, studies of the digital economy have also begun to include more substantial analysis of the state of affairs in developing countries (UNCTAD 2017a, World Bank 2016).

We might also argue that in the last few years that discussion of digital economies are again shifting, focussing on the way that digital technologies, services, products, techniques, and skills are diffusing across economies. This process is often referred to as digitalisation, defined as the transition of businesses

through the use of digital technologies, products and services (Brennen & Kreiss 2014)¹. Digital products and services are facilitating more rapid change across a wider range of sectors, not just selected few high technology sectors that have mainly been the focus in the previous eras (Malecki & Moriset 2007). Reflecting this change, the tone of some recent work covering the digital economy has focussed on ‘digitalisation’ and ‘digital transformation’ (the ways that digital products and services are increasingly disrupting traditional sectors) to make more emphasis on the cross-cutting trends related to digital (OECD 2017, OECD 2016, UNCTAD 2017b). This recent shift is especially relevant to developing countries, where more established sectors, such as agriculture, tourism and transportation, appear to have been greatly impacted by the digital economy. Economic changes may come through digitalisation across a wider range of traditional sectors rather than the emergence of new, digital-enabled sectors.

2.2. The focus of analysis in the digital economy

The two most common positions taken when analysing the digital economy in research and global reports has been of the digital economy as an *outcome*, and the digital economy as a *set of technologies*. We argue that neither is sufficient in providing a clear enough definition, although they highlight some useful directions.

As was outlined previously, analysis of the digital economy has often looked to explore how investments and policy in technologies or infrastructure enable or limit the emergence of the digital economy (analysing areas such as infrastructure investments, policy change and ICT firms numbers and size). This type of exploration continues to be a key part of analysis, where the digital economy is seen as an outcome of a set of national investments, somewhat similar to other terms such as ‘closing the global digital divide’ or ‘digital inclusion’. Such as position is for example taken, in the World Bank’s World Development Report 2016 on digital development and the 2018 G20 declaration on the digital economy as highlighted in the quotes below.

“nearly 60 percent of the world’s people are still offline and can’t fully participate in the digital economy.” (World Bank 2016, p4).

“New opportunities for entrepreneurship and self-employment are also growing rapidly in the digital economy” (World Bank 2016, p14).

“A thriving digital economy relies on quality, affordable, secure, accessible and inclusive digital infrastructure, an environment that supports innovation, appropriate policy frameworks...” (G20 2018 p.1)

¹ *Digitalisation*, which covers the broader implications of the growth of digital technologies, is seen as separate to the underlying technical processes of *digitisation* by which information is converted into from analogue to digital flows (See Brennen & Kreiss 2014).

The problem with such perspectives is that the benefits of the digital economy (participation in the digital economy, growth in jobs, skills, income) are often assumed without critical analysis of what this participation means. The key focus is about the right policies and conditions in place to expand the digital economy without understanding if that investment will lead to economic development.

Moving towards more critically exploring the *processes* occurring in the digital economy, the digital economy has often been associated with a certain set of technologies. For instance, the UNCTAD Information Economy Report(2017b) discussed the digital economy linked with key transformations with advanced robotics, artificial intelligence, the Internet of Things (IoT), cloud computing, big data analytics and three-dimensional (3D) printing. Similarly the most recent OCED Digital Economy Outlook forefronts IoT, big data analytics, AI and the blockchain as the main technologies of interest(OECD 2017). With the rapid evolution of the digital economy, the key technologies described by such work rapidly evolves. For instance, the OECD Digital Economy Outlook (2012) highlighted social networks, social media and user-generated content as some the emergent areas of relevance to the digital economy.

These two perspectives highlight important aspects of the digital economy. There is still benefit for developing country policy makers exploring the enablers and barriers which may shape the ability to be part of the digital economy, particularly where regulation and infrastructure is still being put in place. However, studying the digital economy solely as an outcome leads to a lack of critical analysis of the benefits and challenges and may lead to limited policy knowledge of regulating the emerging digital economy. Choosing specific technologies to explore processes of change in the digital economy is useful, but the selection of technologies will often reflect the specific challenges and concerns organisations, practitioners and policy makers face, and it can be unclear why certain technologies have been selected and not others. The technology-led approach to the digital economy is especially of concern for developing countries where relevant technologies may be different. For example, there have been fewer studies of the digital economy in terms of mobile payments, new modes of mobile finance and e-commerce, even if these are arguably at the forefront of the growth of the digital economy in developing countries (with some exceptions such as Dahlman et al. 2016, UNEP 2014). To overcome this limitation, as outlined in the next section, it is useful to explore in more details the key components of the digital economy more generally, to provide a broader explanation of the different processes and technologies.

2.3. Components of the digital economy

As implied by the above discussion, the digital economy is typically connected with a broad range of different technologies and economic aspects. More systematic literature has broken the digital economy

into a number of broad components: (Adapting Bukht & Heeks 2017, Malecki & Moriset 2007, UNCTAD 2017b)²

- **The core** aspects that enable the digital economy comprising fundamental innovations (chips, processors), core technologies (computers, telecoms devices) and enabling infrastructures (internet and telecoms networks) that are the foundation of the digital economy.
- **Digital and IT sectors** as producing key products or services which rely on core digital technologies such as digital platforms, mobile applications and payment services. One might think specifically of the digital economy as being driven by innovative services in these sectors - leading to these sectors making a growing contribution to economies, as well as the spillover effect that these products and services have across sectors.
- **Digitally-enabled sectors** where new activities or business models have emerged where sectors are being transformed as a result of digital technologies. Media, tourism and transportation are examples of digitally-enabled sectors where new business models have been facilitated by the digital economy.
- **A wider set of digitalising sectors** which highlight that digital products and services are increasingly used across a broader expanse of the economy (e.g. e-commerce). Even if change is relatively incremental, a wide range of sectors of the economy are being digitalised.
- Although less prominently mentioned, the importance to explore the role of digitally-literate or skilled **consumers, buyers and users** as a crucial aspect of driving the growth of the digital economy.

This set of components have been used as the basis to measure the extent and impact of the digital economy. At their simplest, methodologies will focus on measures of the *core* and *digital/IT sectors* (or suitable proxies), analysing investment and policies for the digital economy (e.g. infrastructure investments, broadband adoption) and how these link to the growth of the digital economy, particularly in terms of outputs and jobs in the digital and digitally-enabled components of the economy (OECD 2017, UNCTAD 2017b, UNCTAD 2017a). This type of work is also valuable in developing countries as the digital economy grows by providing a clear direction for policies and investment in the digital economy, and some insights on the impacts on firms, consumers and workers.

² There are still debates about which specific sectors or categorisations are included or excluded from these analysed as digital or IT firms in some analysis. For example, sectors such as gaming, digital media and financial services which might arguably be seen as key firms in digital economies, but have not been included in some of the measurements (HoC 2016).

Measuring the digital economy beyond digital and digitally-enabled sectors is, however, more challenging given the relatively intangible nature of digital flows. Impacts from digital technologies often come through spillover effects, and more intangible outcomes such as firm flexibility, management approaches or productivity which will also depend on other variables (Brynjolfsson 1993). Nevertheless, work has looked to explore digitalisation through a number of approaches such as surveys and data on e-commerce³, measuring the spillover effect from the ICT/digital sectors across the wider sections of the economy (Barefoot et al. 2018, Knickrehm et al. 2016), and experimental work that looks to explore the changing geography of global data and knowledge (Manyika et al. 2014, Ojanpera et al. 2016). Thus, there are approaches to measuring digitalisation but they can be limited by methodological challenges. Such challenges are a core part of the 2017 Ministerial declaration on the Digital Economy from the G20, with future initiatives to better measure and standardise such measures. As well as measurement issues there are also more conceptual questions related to digitalisation. As digital technologies become part of ever more transactions in the economy, such explorations of the digital economy may become irrelevant, inseparable from the broader functioning of the economy. These challenges (of measurement and conceptual) have meant that the focus of the digital economy is often on the former two or three elements shown above, which are easiest to assess.

Where formally defined, definitions of the digital economy closely relate to the components outlined above. The digital economy might be defined related to the use of digital technologies with a certain level of ‘intensity’ or ‘disruption’. Alternatively, the digital economy is seen as the processes by which digital technologies are changing everyday innovation, business and transactions across all sectors.

Bukht & Heeks’(2017) definition highlights the idea of the digital economy within ‘intensive’ activity. The digital economy is,

“that part of economic output derived solely or primarily from digital technologies with a business model based on digital goods or services” (p17).

This definition based on intensity broadly aligns with a number of studies (e.g. Barefoot et al. 2018, OECD 2012, UNCTAD 2017a)⁴. In contrast to ‘intensive’ digital activity, the digital economy might alternatively be seen to encompass all the ways in which digital technologies are diffusing into the

³ For example, surveys on internet-enabled trade and use of e-commerce data provides indications as to the extent and impacts of digitalisation. Nevertheless, these figures often only provide ballpark indicators and it is challenging to access transparent data

⁴ It should be noted that many of these studies acknowledge that the definition of what should, or should not, be included within this definition is often “fuzzy” and need not necessarily exclude some exploration of broader digitally-enabled activities. Nevertheless, these aspects are typically seen as secondary.

economy (Brynjolfsson & Kahin 2002, Knickrehm et al. 2016). For example, Knickrehm et al.(ibid.) define the digital economy in far broader terms. The digital economy is,

“the share of total economic output derived from a number of broad “digital” inputs. These digital inputs include digital skills, digital equipment (hardware, software and communications equipment) and the intermediate digital goods and services used in production. Such broad measures reflect the foundations of the digital economy.” (p2)

In sum, given the focus on value in this paper, there is a particular emphasis on the *processes* of formation and change in the digital economy rather than as an *outcome* of activities. This will then shape the types of policy suggested which revolve around the processes of how the digital economy is operating (and less on the conditions for the favourable emergence of the digital economy). While we discuss some specific technologies, this paper also tends to focus on broader trends such as platformization and e-commerce (see later section) which allows analysis of changes in the digital economy but with the acknowledgment that this might happen in different ways globally. The definitions outlined above are useful by highlighting the varying emphasis of focus on the digital economy - either towards cutting-edge activities in the digital sector or the broader digitalisation of the economy. Given that in developing countries that digitalisation is perceived to be an important driver of change, we lean towards the latter definition in this work. Nevertheless, it is important to highlight that many of the processes occurring will be as a result of the actions of digital and IT firms and services.

3) Drivers of the digital economy

As outlined in the previous section, the digital economy links to a broad range of sectors, technologies and infrastructures. It is, however, useful to explain some of the key technologies which are driving change in the digital economy. Indeed, in developing countries, while a broad range of innovations and infrastructures promise to be transformative (such as artificial intelligence, internet of things and blockchain), many are only in the process of being adopted. Here we discuss two key developments – platforms and datafication – that are fundamental to changing digital economies in developing countries.

3.1. Platforms

The concept of the platform has a relatively long existence. Platforms are essentially seen as mechanisms that bring together a set of parties to interact.

“A platform is a business based on enabling value-creating interactions between external producers and consumers. The platform provides an open, participative infrastructure for these interactions and sets governance conditions for them”(Parker et al. 2016 p.11)

Platforms have been explored in a number of ways, relating for example to their functionalities, their scope (firm, sectoral or economy level), their geographic focus and their levels of openness. An important categorisation relates to their underlying operation and corresponds to two key categories, the transaction platform and the technology platform (Gawer 2014, Koskinen et al. 2018, Parker et al. 2016).

Transaction platforms, sometimes referred to as two/multi-sided platforms or two/multi-sided markets, outline an infrastructure, typically an online resource which supports exchange between a number of different parties (Gawer 2014). The transaction platform has been closely associated with transformation in the digital economy globally, connected to it becoming a core business model adopted for a large number of digital firms such as Facebook and eBay, as well as those that are supporting digitally-enabled sectors such as Uber and Airbnb.

Platforms have also often been associated with an innovation or technology perspective, typically referred to as engineering, innovation or technology platforms. Here, the terminology of platforms highlights the way that firms, industries or sectors use “component and subsystem assets shared across a family of products”(Krishnan & Gupta 2001 p.52). Examples of technology platforms exist at both an industry and firm level. At an industry level, technology platforms provide ways for common designs or interaction across a sector. Relevant examples to the digital economy include operating systems (such as Android or Linux), technology standards (such as MPEG video) which provide a common approach by which firms interact within a sector. At a firm level, firms may create technology platforms as part of their product offerings, adding additional features to the technology platform for specific product models. Products or service are defined by shared core components and a set of complementary modules, allowing for a more consistent and flexible building of technologies. Examples of firm level platforms include PC chipsets such as Qualcomm and firm specific operating systems such as Microsoft Windows (Gawer & Cusumano 2002).

While transaction platforms are at the centre of debates about the digital economy, the two types of platform have many similarities. Thus, technology platform literature which has built a richer understanding of the complementary between platforms providers and other firms or individuals who contribute to platform often referred to as platform ecosystems)(Tiwana 2014) and how the opening of platforms can drive growth (openness)(Boudreau 2010). These concepts are useful for understanding how platforms grow and expand. Evidence also suggests that as transaction platforms grow, transaction and technology platforms overlap (Andersson Schwarz 2017, Sturgeon 2017). For example, Google’s leadership in the Android operating system sees a set of intersecting technological platforms (Android,

core smartphone designs) and transaction platforms (Google Play Store, Google Search) that are often crucial to consider together.

A key process that has driven platform growth is related to ‘network effects’. This outlines the benefits that accrue to users of a platform from additional users joining (Van Alstyne et al. 2016). Platforms include two or more different types of transacting partners, whether that be room providers and tourists (Airbnb), advertisers and consumers (Facebook) or goods sellers, buyers, credit card providers, logistics providers (Alibaba). Thus, beyond the direct network effects, platforms also have indirect (cross-sided) networks effects where the expansion of one side of the market, increases the value for the other group (Rochet & Tirole 2006). The impact of network effects is the tendency for successful platforms to rapidly grow as network effect make platforms more desirable. Network effects also act as a lock-in on platforms. Actors are more likely to remain on a platform rather than to migrate to competitors due to the value of network effects, and this is likely to pose challenges in managing competitive markets (Gawer 2014).

3.2. Data

The growth of data has been central to the expansion of digital firms, and for many of the large digital firms, the monetization of data is the main source of profit (e.g. Facebook, Google). Definitions of data from information science typically see data as part of a hierarchy, linked to information and knowledge. In this hierarchy,

- **Data** are the unfiltered symbols or signals from a variety of activities and inputs.
- Through a range of transformations (such as filtering, aggregating or ordering), data can be transformed into **information** (e.g. when transaction data coming into the firm is interpreted as a 5% profit for the year).
- Information can then be used to support a person(s) experience, skills or mental models which contributes to **knowledge** (e.g. the 5% firm profit might support a manager's ideas of a business model) (Dalkir 2005, Davenport & Prusak 1998).

In recent years, a focus of data related to the huge growth in the availability of data, with the increasing expansion of online capture of activity, devices and datafication (Mayer-Schönberger & Cukier 2013). The term ‘big data’ has been popularised to denote the broader range of data that is increasingly available to individuals, firms and societies. The ‘big’ in big data is specifically defined along a number of axes: in terms of the growing *volume* of data available (e.g. online data, sensors, devices); in terms of the wider *variety* of data that might be interpreted and combined with other data (e.g. unstructured data such as

video and internet logs); in terms of *velocity*, where data is generated at a very high rate, and in some examples also requires real-time interpretation (Laney 2001).

With the growth of big data, there are growing challenges in transforming this data into useful information and how that links to decision making. So data has become associated with an entire chain of firms that support producing insights from data, including data acquisition (to provide new sources of data), data storage and warehousing, data extraction and modelling, and data visualisation. The outcome of these processes may be intelligence which informs firms (and other organizations) around decision making and innovation but also products, processes or services which use this data in automated decision making, shaped by algorithms (Mayer-Schönberger & Cukier 2013).

Data is increasingly an important part of digital economies in the developing world. For example, a growing number of apps (such as financial services) draw on data about consumer transaction and online payments as a source for assessing the risk of those customers. On platforms, data may not be visible to actors involved in platforms, but the way this data is aggregated and sold is often core to successful business models of platforms. Exploring the ways that data is being regulated, aggregated and interpreted by firms, and how specific firms are deriving value from that data is thus key to understanding the digital economy.

4) Assessing the impact of the digital economy

In order to analyse the impacts of the digital economy, this section introduces the idea of value in the digital economy. Such a concept is valuable because, as outlined in the next section, the outcomes of a growing digital economy are often uneven, and with a number of different direct and indirect impacts. To support an analysis of value a conceptual framework is developed to support clearer analysis and perspectives.

4.1. The uneven impacts of the digital economy

As the digital economy has expanded into developing countries, those exploring the processes unfolding have observed that the impacts are often uneven, and can lead to new challenges for individuals, firms and policy. Here we provide a flavour of some of those impacts. The goal is not to comprehensively examine the impacts here, but to highlight the importance of exploring the impacts of the digital economy more conceptually.

At an individual level, research has shown that an expanding digital economy in developing countries does generate some high skilled jobs, especially in the ICT sector, but these positions typically require

relatively high technical and analytical skills (World Bank 2018). There are often fewer opportunities for low income groups (UNCTAD 2017b, World Bank 2018). To counter these tendencies, there has been growing promotion of other types of digitally-enabled productive activities, such as low skilled “digital work” as a potential first step into the digital economy (Graham & Mann 2013). Policy makers and practitioners have looked to push interventions, for example through supporting the growth of IT-enabled services and impact outsourcing within developing countries, as a way to provide entrance and learning in the digital economy for those with lower skills (Beerepoot & Keijser 2014, Heeks & Arun 2010). However, it is not clear how successful such interventions have been and these may simply lead to the creation of new low wage, unstable digital work. Individuals in the broader economy also face challenges as a wider range of economic sectors digitalise. New technologies in production and improvement in productivity may lead to technology-driven changes in jobs which can reduce wages or even lead to unemployment (Frey & Rahbari 2016).

At a firm level, the growth of the digital economy in developing countries does not necessarily imply the expansion of local digital firms (Foster et al. 2018). Typically, key platforms and data providers shaping local digital economies have tended to be large multinational firms or digital firms acting from afar (Caribou Digital 2016, Evans & Gawer 2016). Local firms can emerge through the expansion of ‘digital ecosystems’ defined as the decentralised set of firms, data and processes that are connected through the use of digital resources, particularly related to supporting online platforms. In developing countries, digital ecosystems are made up of local start-ups (such as payment providers, logistics or mobile app/service providers) who play an important role in localising digital services (Bukht & Heeks 2018). While providing some more skilled work in the digital economy, these firms are often in uneven relationships with the larger platform providers, whose actions shape their activities, profits and ultimately their direction of growth (Srnicek 2016). Platforms may also incorporate firms and actors into the digital economy, but these may be under adverse terms (e.g. low profits, unstable environment) (IT for Change 2017). Digitalisation in the broader economy may lead to new efficiencies, and in the future lead to transformative changes in well-established sectors in developing countries. With growing efficiency and automation of production, there is potential that work previously done in developing countries may disappear, or alternatively become ‘reshored’ back to developed countries (Banga & Willem 2018, Hallward-Driemeier & Nayyar 2018).

This outline highlights evidence that the growth of the digital economy might lead to uneven impacts and spillovers. We summarise these discussions in Table 1 which highlights that impacts might vary across a number of dimensions (e.g. productivity, GDP, value added, employment, income), between different

actors in the digital economy (e.g. workers, MSME), and across different components of the digital economy (e.g. digital sector and digitally-enabled sectors). The table also highlights that impacts of the digital economy will be felt amongst those individuals and firms who do not, or only partially exploit the digital economy. For instance, low income workers may find themselves marginalised by more efficient workers in digitally-enabled sectors, incumbent local firms who do not digitalise may be crowded out by digitalising transnationals.

This is not to say that these uneven outcomes are inevitable, but the digital economy can have mixed and competing outcomes that require careful attention from policy and practitioners. For instance, digital jobs provide valuable paid work for marginal groups in developing countries but these are often under poor terms and unstable. Foreign digital firms in developing countries support foreign investment and innovation in a country, but the unchecked growth of such digital firms may be at the expense of local industries. These types of contradictory impacts indicate where a deeper exploration of *value* can be important. Value theories provide us with an approach to explore the ways that different actors gain or lose from the digital economy. Discussions of value can also support policy makers in articulating the specific development goals they think are valuable, and how they want to shape the processes of digital economy through policy in the future.

		Actors				
		Individual	MSMEs	TNC	Government issues	Macro-level impacts
Component of the digital economy	Core	<ul style="list-style-type: none"> Jobs in creating and installing infrastructure. R&D likely to be located in high income countries 	<ul style="list-style-type: none"> Possibility of inclusion given suitable circumstances or spillovers 	<ul style="list-style-type: none"> Jobs driven by investments. Often higher skilled 	<ul style="list-style-type: none"> Attracting investment Diffusion of technologies 	<ul style="list-style-type: none"> Increased growth, productivity and value added Employment opportunities Investment
	Digital and IT sectors	<ul style="list-style-type: none"> New job opportunities in sectors often for higher skilled groups Emergence of new forms of digital work including lower skilled 	<ul style="list-style-type: none"> Entrepreneurial opportunities particularly in digital ecosystems Challenges around foreign digital firms in developing countries 	<ul style="list-style-type: none"> Data driven business models Platform business models 	<ul style="list-style-type: none"> Enabling environment Technology transfer Fair taxation of foreign firms 	<ul style="list-style-type: none"> Increased growth, productivity and value added Employment opportunities Investment
	Digitally-enabled sectors	<ul style="list-style-type: none"> Expansion of new digital jobs (e.g digital work, gig economy) Potential challenges where higher value roles are redesigned using digital Improvement in efficiency of services 	<ul style="list-style-type: none"> Platforms provide large market for MSME Potential “race to the bottom” in markets vs ability to find niche 	<ul style="list-style-type: none"> Emergence of platform firms with data driven models Challenges for incumbent firms 	<ul style="list-style-type: none"> Fair conditions for workers and MSME Simplifying small firm activity (e.g. e-government, tax) Supporting platform entrance for MSME 	<ul style="list-style-type: none"> Growth through efficient sectors Potential crowding out of local firms as sectors are disrupted by digital Growth in inequality and unstable working
	Digitalizing sectors	<ul style="list-style-type: none"> Job evolution or substitution as sectors are reformed. Potential job losses due to automation 	<ul style="list-style-type: none"> Efficiencies may reduce some roles (e.g. automating logistics) Potential new roles in service provision 	<ul style="list-style-type: none"> Leading digitalisation in sectors Gains from productivity and quality 	<ul style="list-style-type: none"> Supporting conditions for investments and upgrading Workers and skills or reskilling 	<ul style="list-style-type: none"> Productivity improvements Potential automation in low and mid-skill jobs, pushing inequality

Table 1: Outline of uneven changes from the digital economy broken down by components digital economy

4.2. Theories of value

Theories of value are as old as the field of economics itself and relate to the underlying assumptions of what is, and what is not, of value in the economy. Value has been defined related to the production of goods and services. “How outputs are produced (production), how they are shared across the economy (distribution) and what is done with the earnings that are created from their production (reinvestment) are key questions in defining economic value”(Mazzucato 2018 p.16). As highlighted in this definition, the processes of production (when they produce useful products and services) are seen as the main source of value creation in society through transformation of raw materials into goods and services. It is this productive transformation by which wealth is created and potentially then distributed across society (Mazzucato 2018).

While it is beyond the scope of this paper to critically explore the various theories of value in detail (see box for an introduction), the history of different perspectives on value is useful in highlighting the varying emphasis. Specifically, value is projected in a number of ways. Objective approaches would look to explore economic value by identifying where value (as surplus profits) is captured and distributed, and more critically linking this to unfair monopolies and divisions of labour in production. Recent work on digital work in developing countries, for example, has drawn on these ideas leading to the concept of “digital labour”(Fuchs 2014). Critiques of digital work argue that digital workers are incorporated into highly uneven relationships with online platforms who tightly control platforms and minimise the freedoms of workers.

Subjective approaches to value align with business-orientated approaches which focus on how value emerges through firms creating value or value-adding to products and services and thus gaining from an improved price. For example, in developing countries, one challenge of digital platforms is that new platforms have led to global markets for goods, labour or services (over local, regional). This may lead to an increased supply of goods, increased competition and a reduction in prices (Graham et al. 2017). Alternatively, firms that create ‘temporary rents’ through niche products and innovations, finding themselves able to charge higher prices and make profits, potentially reaching a broader, global customer base (Foster et al. 2018).

Box 1: Theories of value in a historical context

Whilst it is beyond the scope of this paper to critically explore the various theories of value in detail, the history of different perspectives can be useful in highlighting key directions and arguments,

Analysis of value has emerged from two perspectives, which are often referred to as the objective and subjective perspectives. The objective perspective is based on the idea that value of goods and services will typically be linked to the amount of labour used to produce them, be that direct (in terms of worker's time) and indirect (in terms of the labour costs of the services and inputs used). Subjective perspectives take a contrasting view, arguing that value is not something that can be measured objectively based on the labour used to produce them. Instead, value is determined by the price, which is shaped by a consumer's willingness to pay for goods and services. When customer willingness to pay is linked to the marginal cost of producing additional goods by firms, a subjective price equilibrium will emerge.

***David Ricardo** (1772-1823) used objective ideas to try to understand the idea of rent. He focussed on the value of simple agricultural commodities, arguing that value would be equal to the cost of labour used to produce that commodity (directly in terms of farmers, and indirectly in terms of inputs and machines used in this process). However, not all commodities will be equal in terms of their value, given that the land producing the commodities will be more or less productive. Landowners with more productive land will produce more commodities and thus reap a profit. Thus Ricardo conceptualised 'rent', which is the additional profit that a landowner gained in profits from owning the scarce asset of land. In Ricardo's analysis of nobility in the 18th century, he focussed on this rent as unproductive, emerging from historic monopolies of a few over productive land. These monopolies were seen as unproductive to the national economy given that the rent produced by the nobility was then used in 'lavish lifestyles' as opposed to being reinvested in production.*

***Karl Marx's** (1818 – 1883) understanding of value was strongly influenced by those of Ricardo, but he takes an additional step by focussing more on labour. Marx's focus was on profit generated within production in 19th century factories during the industrial revolution. He positioned 'surplus value' as the difference between the costs of labour expended in production and the exchange prices of goods sold by factory owners. Marx, thus saw the ownership of the means of production as problematic, generating surplus value through the increasing exploitation of workers. These surpluses may be reinvested back into production by owners, but this is likely to lead to further mechanisation of production and further exploitation of workers.*

*Subjective theories of value, and particularly utility theory-based models as supported by **Alfred Marshall** (1842-1925) amongst others, sees the value of a good or service to reflect the utility of a good or service to the buyer. So for example, a scarcer good will be of more value than a relatively more abundant one. The market price of a good will thus reflect the utility to a set of (rational) buyers, as well as being linked to the costs of producing those goods. This perspective thus does not see the price as anchored to the cost of production. In a competitive market, profits are no longer seen as productive or unproductive, given that they are determined by the costs of production, the demand and utility of consumers.*

These three ideas of value form the basis of many modern-day interpretations of value, and so it is worth reflecting on their implications. Ricardian perspectives are important in that they highlight the way that monopolies can lead to unproductive surpluses which may not be beneficial to wider society. Marxian perspectives stress that the surplus is often developed through the exploitation of labour. The divisions between controllers of production and workers can lead to unproductive outcomes in society. Utility-driven models of value highlight the way that value is related to the price of goods in exchange, which is determined by the scarcity of goods and services, as well as linked to the customer's perception of the utility of a good or service, and thus their willingness to pay.

Whilst these different approaches to value underlie foundations of vastly different economic fields and models, it is possible that they can be considered together within conceptual frameworks. For example, global value chain analysis is grounded in critical studies of the division of labour in global production,

yet they increasingly include notions which bring in ideas from more objective perspectives on value to include analysis of branding premiums and innovation that point towards more objective models.

(Adapted from King & McLure 2014, Mazzucato 2018, Taylor 1996). Based on (Marshall 2009, Marx 1867, Ricardo 1891)

4.3. Dimensions of value in the digital economy

Historic ideas around value are important to highlight the broad considerations that might be useful to explore in an analysis of value. To move from this broad set of potential considerations, we suggest that there are four dimensions that can provide a useful approach for digging into the details of value in the digital economy. We highlight four elements in Figure 1 and discussed in more detail below:

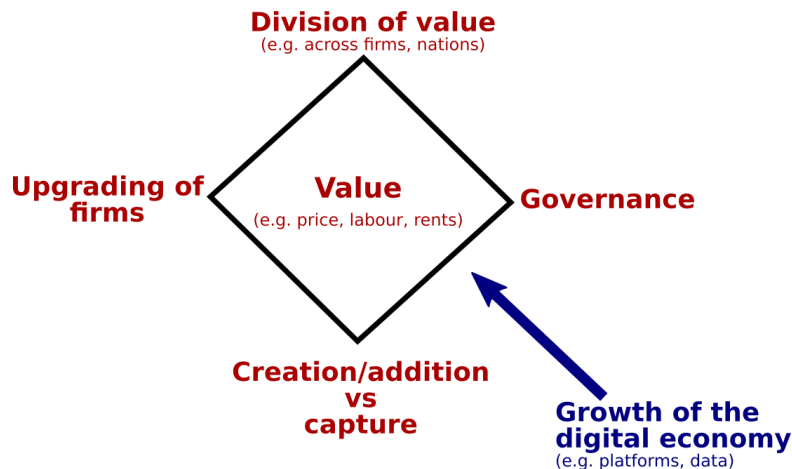


Figure 1: Key aspects of exploring value

Distribution of value - In the modern economy, economic production is typically fragmented through networks, chains or ecosystems of interconnecting firms. Value is likely to be divided amongst a range of firms in developed and developing countries (and onto workers) in uneven ways. Of specific relevance to developing countries, leading firms (often international firm) often outsource certain elements of their activities in order to focus on core skills and competencies (Prahalad & Hamel 1990). For more marginal firms in developing countries, activities undertaken are thus often said to be considered of “lower value”. That may be in terms of the low value of goods or services produced by them, they may be labour intensive, dangerous or require low skills, and as such can be easily moved to another location (Gereffi 1994). Thus, analysis of the conditions of value across interconnecting firms and workers is central to analysing value. What aspects are chosen to explore (income, price, wages, profits, gender balance, rural vs urban location amongst others) are likely to depend on the specific perspective or goals of practitioners

or policy makers. In the digital economy, for example, an analysis of labour outcomes have identified low value digital work (e.g. click workers), and digital ecosystem activities (e.g. mobile finance agents). Workers in these specific relationships are often strongly involved in creating value, but they are often in unstable, poorly paid positions (Berg et al. 2018, Foster 2014). If such activities grow in the digital economy, then at a macro-level they might be unproductive. Consequently, the distribution of value also offers a standpoint to consider options of redistribution from the perspective of policy makers and practitioners.

Upgrading - While low value positions might be unproductive in the short term, in the longer term firms or individuals may be able to dynamically shift their position. Such upgrading paths are not inevitable, but low value work can be part of a strategy for learning and improvement, whereby individuals or firms dynamically move from lower value activities to higher value activities (Gereffi et al. 2005, Kaplinsky & Morris 2001). In the digital economy, low value activities can provide a means of entrance into networks and ecosystems of production, and a source of learning, technology and better value over time. As outlined in the next section, in the digital economy in developing countries, we have seen some examples of upgrading, such as the move of some small tourism service providers to selling directly online to customers, Some start-ups in developing countries have been able to move from simple to value-added service provision over time. Thus in upgrading a focus can be on exploring and supporting path for process and product improvements or innovation, whereby firms create more value from their productive activity or upgrade (Kaplinsky 1998).

Governance - The distribution of value and the dynamics of upgrading typically link to the role of powerful actors. For example, a range of conditions may limit the ability of firms to upgrade to higher value roles - conditions on the way goods and services are delivered, the quality of the outputs, the costs and skills, technologies, the language skills required to deliver goods and services to customers (Gereffi 1994, Ponte & Gibbon 2005). Barriers to upgrading can also be put in place, linked to personal preference and connections, policy and rules, long-running norms and culture (Foster et al. 2018). Thus, the dynamics of moving to higher value activities are shaped by powerful firms involved. The notion of governance here is used to highlight that these activities are often controlled by selected private firms and that this power does not always occur directly, but as indirect or ongoing interactions, rules or norms which shape upgrading paths (Ponte & Sturgeon 2014) (This term thus contrasts with its typical use within policy connected to public governance). In the digital economy, governance might be explored in terms of older 'lead firms' in digitalised value chains but also newer actors such as platform firms who can shape

upgrading. In the digital economy, the power centres of governance are likely to be located in selected advanced economies and this creates challenges in terms of reach and vision for local policy makers.

Value creation vs capture - It is increasingly important to recognise the difference between value creation, value addition and value capture (Coe & Yeung 2015, Henderson et al. 2002). As implied by the discussion of upgrading, typically a focus on value has centred around value creation, value addition, value-added by actors and the role they play in creating value in production. From a development perspective, the upgrading from a lower to a higher value position is thus seen as positive, where firms and workers are seen to be undertaking more skilled activities. However, this account may fail to take into account value capture – which in the case of firms has been described as “the ability for firms to retain their surplus within their organisational boundaries” (Coe & Yeung 2015 p.171). It can be the case that actors in improved positions of production find that there are ways that their value is being extracted elsewhere. This concept of value capture is especially important in the digital sector. Firms and workers moving into the digital economy and involved in online activities are often seen as upgrading their skills, but if the bulk of value is being extracted elsewhere then this can be problematic. For example, low income taxi drivers may be perceived as advancing with their use of apps, mapping and communication, but if they are in uneven relationships within platform firms (e.g. commissions) then these scenarios may not be a better option in the longer term.

In sum, given that in developing countries the digital economy is only beginning to emerge, there is thus a relatively limited understanding of value distribution and trajectories in the digital economy. Specifically, as driven by platforms and data, it is increasingly important to identify the ways by which firms are able to create value or barriers they face in the digital economy. This applied approach to exploring value can be useful to understand the uneven impacts of the digital economy by highlighting the distribution of value, the potential dynamic paths, the firms controlling value and new forms of value capture. In the following sections, we aim to do this by exploring some key trends identified in developing countries.

5) Value in the digital economy in practice

In this section, we look to provide a more concrete outline of how the digital economy is impacting on value in developing countries. For this, we explore three important trends occurring in developing countries related to platformization, E-commerce and digitalisation. Through an analysis we highlight how value in the digital economy is changing in these cases. This analysis also helps us to reflect on broader implications and policy in the next section.

5.1. Platformization

Online transaction platforms, as introduced earlier, are at the heart of the digital economy and are having disruptive effects across a number of sectors, which we term platformization. Two important shifts that have emerged are the ways that platforms are reshaping the nature of transactions in certain sectors of the economy, and the ways in which these platforms rapidly scale-up to impact sectors.

In terms of the nature of transactions, there is a move from a focus on linear ‘pipeline’ models of interactions towards transaction forms centred on platforms (Van Alstyne et al. 2016). Pipeline models suggest that goods and services have often been produced along a set of linear activities, where products and services are ‘pushed’ to the customer through a series of stages which add value. Platformization, while not necessarily excluding the existence of a supply chain, draw attention to the central role of the platform transaction in terms of value creation. Platforms are rather different from pipelines in that there is a relatively lower bar for firms and individuals to enter in order to provide a more diverse range of products, services and customers. Platforms thus move from ‘push’ models to ‘pull’ modes of activity, where platforms provide the support and services for transacting parties to ensure they are able to transact on the platform⁵, and interact with customers (Cusumano & Gawer 2002).

The power of platform business models has come in how they allow platform firms to rapidly scale in comparison to previous business models. Often, rather than being the owner of specific goods, services or labour, platforms operate by bringing together different parties to transact and as such, they are asset light (at least in the early stages). The rapid global expansion and dominance of so-called ride-sharing platforms illustrate this phenomenon. By not owning the core assets (taxis) and employees (taxi drivers are contractors), such platforms invest lightly in human and physical assets which enables more rapid expansion at low costs (Parker et al. 2016). Platform firms are also most likely to be the owners and users of big data, where ownership of platforms allow them to harvest rich data as users interact. This data is then an important part of gathering intelligence and improving platforms as well as a potential asset which can be sold onto third parties. Rapid scaling has also been seen in developing country platforms, as highlighted by firms such as Gojek in Indonesia, Ola in India and Careem in MENA and Pakistan, all who with relatively small assets have been able to compete with established transportation services, some expanding outside their own borders rapidly (For example Cornwell 2018, Kollewe 2018).

⁵ At its most basic, virtually all platforms include rating, reviews, filters and comments that (in theory) provide customers with the ability to choose the appropriate product or service. But many platforms have expanded beyond this, for example in order to support SME in China, Alibaba has progressively offered a wider array of services to pull in SME to its platform including credit, warehousing and free cloud software to run small businesses, with the goal to improve their ability to trade professionally on the Alibaba platform (they also have the advantage of supporting lock in of the customer to the platform)

The risk of asset light expansion is that users can rapidly switch to competitors, for example, if they impose problematic conditions on sellers or customers. Thus, to retain their position, platform owners may undertake practices to reduce risks of flight, such as controlling certain activities on platforms and even pushing platform lock-in and in the worst case uncompetitive practices (Parker et al. 2016). For example, Android pushes users to use only software from the Google Play platform to maintain their control of apps and commission levels. The challenge is that when platforms are dominant, it is very difficult for practitioners or policy makers to offer alternatives. In the case of Google Play, only China has been able to set high-level interventions by demanding that local equipment providers offer their own app stores on their devices. In the EU, recent court action is looking to remedy this position through the European Court, but for developing country policy makers uncompetitive actions and lock-ins of foreign platforms are very difficult to challenge.

Beyond service design, platform owners have also looked to defend their positions, through acquisitions of potential rivals or parallel sectors. These trends around 'vertical integration' are best shown in the behaviours of the largest platforms providers - Google, Facebook and Apple where purchases in the areas of AI, photosharing and advertising can be seen as part of such strategies (Srnicek 2016). Of particular interest in developing and emerging nations, successful platform providers are often purchased and then integrated with global platforms. For example, Alibaba has acquired or bought significant stakes in firms such as e-commerce firm Lazada an e-commerce site operating in six South East Asian countries and Paytm, a payment provider in India. These types of merger could lead to new types of innovation and technology transfer of these smaller platforms. However, there is also a risk of integration into a multinational business models where value is captured far from where it is being created.

Given this expansion and centrality of platformization in the creation of value, a number of conceptual frameworks have looked to link platforms with value in ways which highlight them as new architecture of the digital economy (as shown in Figure 2).

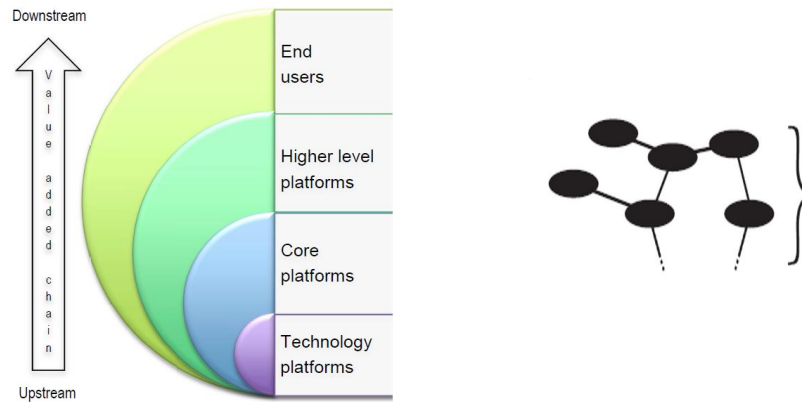


Figure 2: Analytical models related to platforms.
 Source: Left –(Sturgeon 2017 p.10); Right –(Andersson Schwarz 2017 p.379)

On the left, Sturgeon(2017) conceptualises value creation as linked to a set of layered platforms at different levels (from the technology platforms level focussing on specific families of technology, through to transaction platforms used to transact). One might examine the governance and value creation within these different layers of platform, exploring the role of the platform leaders, platform interaction, and the roles of ecosystem firms. Andersson Schwartz’s(2017) more critical work, suggest the way that various platforms cohere in the wider digital economy relates more to a network of interconnecting and disconnected platforms and exploring the connections, tensions and cumulative effects is a better perspective in understanding value.

In sum, platformization highlights a broader change to the digital economy where platforms (both transaction and technology platforms) are the basis for understanding the division of value (as opposed to supply chains, nations, sector etc). As sectors are likely to include multiple platforms, exploring the way that multiple platforms are ‘layered’ or ‘interact’ can then be important in understanding wider economic outcomes. Governance is driven by the platform leader firms and the ways they enable (or not) the buyers and sellers on platforms and the wider digital ecosystems of firms. Opportunities in developing countries come in the new “pull” dynamics of platforms where it is in the benefit of platform owners to support the market entry of small firms into broader markets. Digital firms can also emerge in developing countries in supporting platform ecosystems. Challenges come in the risk of platform ‘lock-in’ for firms, and the ways that platform firms gain market power and then continue to vertically integrate to control sectors. This is particularly challenging for smaller firms or individuals who may find themselves incorporated into platforms under adverse conditions where there is little alternative. There appears to be some potential for some developing country digital firms to adopt platform models and become local leaders. But in some sectors competing against established international leaders with market power will be a challenge.

Whilst platform users (buyers and sellers) can be seen as the value creators, value capture does occur elsewhere when platform leaders push additional costs or fees on firms using platforms. Firms will need to trade off these costs against the broader market opportunities, although again the risk of platform lock-in might limit alternatives. An alternative mode of value capture in platforms also comes from data, which are often core to platform firms' business models. In terms of upgrading, there is evidence that platformization can support smaller firms in developing countries reaching wider markets (eBay 2013). Exploring the trajectories of these firms as they develop within and across platforms could provide a perspective on upgrading, but this is yet to be done. Similarly exploring the trajectories of value creation for developing country firms who are part of digital ecosystems services is an important way forward. Whether these types of upgrading trajectory exist in volume or not is likely to be an important consideration for policy makers as to whether platforms are offering productive or unproductive value as a whole to the economy.

5.2. E-commerce

A second trend related to developing countries also links to ideas of platformization that were outlined in the previous section but especially focusses on the way that platforms are shaping the user-producer relationships through e-commerce.

Traditionally value is mainly seen to be created in the production process. Customer information and interaction were used in this process, but this was done in a less interactive way, and likely with limited ability for smaller firms to access customer feedback or integrate them into designs. Platforms, by bringing together a broader range of buyers and sellers, change this scenario, by providing the ability for a more dynamic range of goods and services to be offered (Mayer-Schönberger & Cukier 2013).

Platforms are data rich and provide the ability for platform sellers extract data about customers or buyers. Data about customer activities can provide insights into consumer behaviours, opinions and the way that the platforms are working. Firms on e-commerce platforms can thus use their data as a source of improved designs, products and innovations in the future (Srnicsek 2016). There has also been a growth in more active users contributing to new forms of value in e-commerce through user innovation (von Hippel 1988), or as active participants on platforms, as producers, prosumers. These activities are central to creating new value in firms and provide a potential basis from which firms might dynamically improve their products or services, adding value through consumer/user activity (Dong & Wu 2015, Ritzer & Jurgenson 2010).

In developing and emerging economies, we have seen the documented expansion of firms who are able to take advantage of these new platform interactions with customers. Li, Fredrich & Gereffi's (2018) analysis of China apparel sector in the digital economy, highlights the way that a diverse range of platforms provide a diversified set of opportunities for small firms in the apparel sector. A thick interaction between small firms and local markets on platforms, typically provide the impetus to allow firms from generic to build specific branded products over time (OEM to OBM). Other work highlighted similar processes in selected tourism firms, where the use of platforms and customisation can be an important part of creating new value (Foster 2017).

In sum, as shown by studies of small firms and microenterprises in this area, platforms have the potential to become an important crucible of value creation linked to e-commerce (ibid., Li et al. 2018). This view includes similar ideas to that of platformization (as many e-commerce firms are platforms). New forms of governance are still driven by the powerful global e-commerce providers, but in many cases, core to these firm's business models is facilitating the use of their platforms and services (such as Alibaba and eBay). Governance of value may also be shaped by other cross-cutting firms in production such as global logistics firms and payment providers. Small firms in developing countries may be able to become part of platforms due to their relatively low barriers to trading. As outlined above, new value capture emerges in data capture and innovation based on customer interaction, as well as the way that customers as value creators are embedded in production activities. For developing countries, there can be some challenges to upgrading, where the largest online sellers still often dominate in e-commerce (Chen et al. 2016). Further for many smaller firms, price-driven competition in a national or even global market can push down profits, but there is also potentially upgrading paths through e-commerce as shown in cases of incremental improvements of tourism providers and smaller clothing producers.

5.3. Digitalisation

Previous sections highlighted new trends around platformization and e-commerce which are linked to the digital economy. These processes imply relatively disruptive shifts of how goods and services are delivered in the digital economy in developing countries. However, it is also worth considering more gradual changes, linked to the digitalisation of existing production networks which can impact upon the distribution of value (Foster & Graham 2017). More specifically, growing digitalisation and datafication might affect the way that value chains are governed whether that be regional or global ones.

Two changes are important to explore, modularisation and servitization of value chains. A number of works have argued that digitalisation accelerates 'modular' governance of value (Foster et al. 2018, Sturgeon 2017). Modular governance implies that firm in value chains increasingly produce relatively

standardised components in their productive activities. This changes the value chain in that these modular goods and services are of lower value where novelty occurs ‘upstream’ where firms innovate and combine these modules together closer to customers (Sturgeon 2002). For instance, tourism providers are increasingly standardising their goods and services to fit in with online travel agencies; agricultural production is increasingly standardised, monitored and tracked as it moves along the value chain (Foster et al. 2018). Retail-oriented firms outside developing countries tend to create more value from these processes (Fold 2001, Sturgeon 2002).

Digital technologies are also an important element in supporting the servitization of manufacturing processes, where manufacturing and services increasingly overlap. Digital technology is driving the unbundling of services, and making them more ‘tradable’ than previously, supporting more complex networks of services in the production of goods and services. In terms of conceptualising the role of services in shifting value in the digital economy, the ‘smile curve’ has been used to illustrate the impact of the digital economy in terms of specific segments of production as shown in Figure 3.

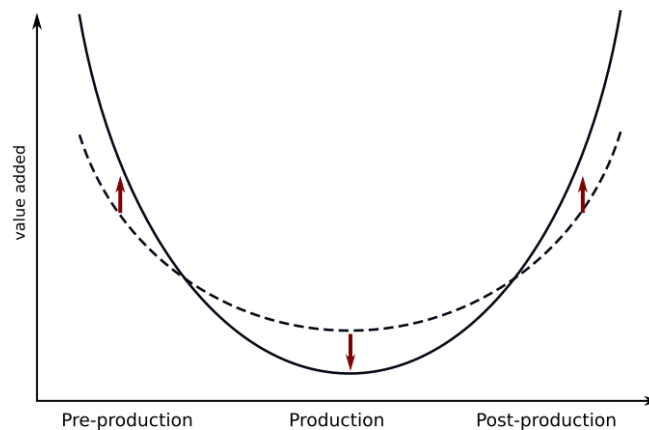


Figure 3: The smile curve and the impact of digitalisation
Source: (Adapted from Mayer 2018, Rehnberg & Ponte 2018, Sturgeon 2017)

The dotted line in Figure 3 represents the current state of affair in terms of where value is added in production. With the expansion of services, services in the pre-production stage (such as design and prototyping driven by services) and post-production (such as after sales services) increasingly add value to goods and service over the production process.

It has been argued as the digital economy grows that we will see a change towards the plain line shown in Figure 3, where value added in production decreases while that is pre- and post-production it increases (Hallward-Driemeier & Nayyar 2018, Mayer 2018, Rehnberg & Ponte 2018). In production, the growth of services is likely to accelerate automation processes leading to a decline in value-added in these

stages. Meanwhile, an expansion of digitalised services will mainly occur in the pre-production stage (such as wider range of design software and data-driven services to inform new goods and services) and the post-production (such as in services embedded in software, enhanced after-sales services).

The outcome of these two processes potentially provides mixed impacts in developing countries. Digitalisation vastly improves transparency in production and can drive savings. Alongside this, servitization can reduce costs that allow better incorporation of smaller firms into higher value-added activities in value chains (UNCTAD 2017b). However, the current evidence is that as goods and services become standardised and datafied, it leads to a shift of control of production from smaller firms to leading supply chain organisers and retailers. Smaller producers may find their outputs increasingly monitored and standardised making them more easily interchangeable. Thus, we have seen new risks for firms who are pulled into such chains where digitalised standards become more onerous and challenging (Kumar 2014) and lead firms can rapidly switch suppliers given onerous conditions or price changes (UNCTAD 2017b).

In sum, the digital economy impacts more traditional chains where value and governance still closely relate to tangible goods in many sectors. In these sectors, modularisation and servitization, driven by digital technologies highlight trends in production: leading firms becoming more focused on innovation and pre- and post- production services with lower value production handed off to other actors. This is particularly driven by these leading firms pushing standardised activities which through digital systems, they can quickly measure and if necessary switch across to other firms. Governance of modularised systems is typically from lead firms in value chains where digital tools and systems can cement their control by providing easier ways of assessing and tracking standards, and quality. Value is increasingly captured within those who control the digital resources and are thus able to access and use the data to manage production. For firms in developing countries, modularized and servitized value chains are potentially lower cost to administer and control. As shown in agricultural cases such as Sorghum production in Africa, it can provide the potential for small firms to enter and participate in globalised production at a lower cost (e.g. IFDC 2015). However, as evidenced in other cases such as tea and coffee production, the digital control exerted in existing value chains reduces the flexibility of actors to drive new approaches (Foster et al. 2018). The ability of lead firms to rapidly switch between modularised suppliers also suggest new forms of risk and instability.

6) Policy implications

The previous section highlighted some of the key trends in the digital economy in developing countries and how these changes are impacting on value. We now use this analysis to discuss the aspects value in more detail and their links to policy. Both specific policies related to the trends, as well as some more cross-cutting directions are identified.

6.1. Division of value

Typically, the production of value in the digital sphere has been seen to include a relatively low number of firms, but in developing countries the growth of platform firms, digital ecosystems, digital workers we see an expansion of actors involved in the digital economy. As highlighted in the previous sections, in developing countries, this included new firms in digital sectors who are providing nascent digital services and applications, but also firms and individuals who are digitalising their existing activities, taking advantage of new digital tools.

The different trends discussed highlight that the focus of value creation and capture may vary across different sectors to include key platforms, e-commerce and lead firms in the traditional value chain. Typically, in developing countries, many of these enhanced value positions, such as key digital services, e-commerce providers and platforms are liable to be run by large, often foreign firms.

For policy makers, the changing division of value highlights a number of important considerations. Policy makers need to recognise that firms in the digital economy are increasingly connected into international networks which shape their activities and thus important policy activities are likely to come in international and multilateral forums as much as locally. In terms of policy processes, seeing the digital economy within these more complex global networks of actors is an important starting point to avoiding poorly targeted policies or potentially unanticipated spillover effects when not all actors are clearly analysed (Foster 2014). The focus of value creation also highlights key areas of policy targeting, whether that be activities that regulate and police platforms as platform owners gain monopoly like control or interventions that encourage firms and individual to use suitable platforms, or the creation of alternative platforms if conditions necessitate.

6.2. Governance

Overall governance of value in the digital economy is a challenge. With the three trends outlined, it appears that digital technologies offer ever more ways of powerful firms to govern and control value in the digital economy. The core source of this new control is data which allows firms in fragmented

relationships to better monitor at ever higher levels of granularity what is occurring and gain insights from this data. For example, the behaviour of firms and individuals on platforms are often strongly affected by what they are allowed to do on the platforms, for example e-commerce platforms shape the types of payment and logistics a platform seller can use, gig economy platforms often provide detailed rules which shape the way that transactions are undertaken. While such guidance may drive regular and consistent services, they may also mismatch with local needs in developing countries. Digital monitoring and control also reduce the ways that firms can be creative by often formalising every step and process that they need to take in their activities. In the long run, this potentially leads to routinisation of activities, and (like some forms of digital work) potentially recast whole sectors of digital service delivery as low value activities. As new technologies such as AI further optimise workers activities such trends are liable to continue.

These trends predominantly suggest negative impacts, particularly in terms of barriers of small firms upgrading to become leading firms or platform owners. However, shifts (driven by platforms and data) from 'push' to 'pull models' highlight significant opportunities in platforms. Historically, value chains or networks of production might be closed to new entrants where governance was tight on firms entering core production. Pull models centred around platforms provide much easier entrance than previously. Indeed, platform providers, be they e-commerce or other platforms, while shaping governance also look to support firm or individual entrance through the provision of multiple tools such as data analytics, ecosystem services and other digital support.

As ever more firms become part of digital economies, close attention to the sites and forms of digital control and opportunity are important. Government supported rules and systems, such as clear employment laws for workers in contracts, clear rules on online contracts and signatures will facilitate better defined systems. In developing countries such rules often exist, but may not be well implemented with respect to firms, thus exploring effective implementation is an important area. Government can also offer additional scaffolding to support appropriate platform entrance. Some examples of such activities include supporting appropriate ecosystems such as agricultural pricing, logistics which support enhanced platform entrance (Kawuma 2015), or through training and skilling programs that push skills to use such platforms (Foster & Graham 2015, Mai & Tuan 2012).

6.3. Upgrading of firms in developing countries

At a macro-level, it appears that the expansion of the digital economy limits some of the classical national paths to upgrading (Mayer 2018, Rodrik 2018). Digitalisation and the stark division in value leads to ever high barriers to moving to higher value added. Moreover, as outlined above, lower value-added roles offer

more routinized activities in the digital economy, and thus upgrading opportunities shaped by dynamic learning may be limited.

Yet, there are new types of micro-level upgrading activities occurring that need further exploration to understand how they might congeal into macro-level change over time. Platforms and e-commerce can lead to more difficult markets due to high, often global competition, but they can also offer the potential for creative and niche innovation and production. These specifically seem to be present where local digital economies are better developed, where developing country firms are able to provide more appropriate services – for example, linked to local modes of payment, in local languages or tailored to local need and demands.

Policy activity might begin to look at these local digital activities and clusters as the basis for broader development. For instance, China's push on Taobao villages can be seen as a policy in this light where further support for creative e-commerce production might push broader rural development of industries through the use of the digital economy

6.4. Forms of value capture

The ways that value is created and captured in the digital economy is changing. Global markets for goods, services and labour in the digital economy drive value capture by platform and lead actors who own production, platforms and other key digital nodes.

Thus, in this new environment, value creation and value capture often diverge. For example, where large platforms emerge, small firms as value creators may find their profits limited by transaction fees as set through platforms or systems. Indeed, new forms of value capture are emerging connected to data, specifically in the emergence of the data value chain described previously. Data aggregation production of value chain intelligence and reselling of data and profiles provide value often at sites far away from the point of interaction. These forms of value are often only available to limited firms who aggregate data. In some parts of the world, in response to these challenges, policy makers are looking to undertake more active policies often referred to as “digital industrial policy” to ensure that the key creators of value are either better regulated or the value extracted is reinvested locally (Azmeah & Foster 2018, Singh 2018).

Another new form of value creation is the ways that value is increasingly embedded in customer interaction processes. Customer interaction favour local, active firms who are able to customise their activities, adapting goods and services dependent on data and online customer interactions. They thus facilitate the potential entrance of local producers, as providing new types of value added. As local,

regional and south-south production grow, pushing innovation and product positioning in these markets shaped by customers can be an important source of value (Knorrinda et al. 2016).

7) Summary

Alongside the expansion of the digital economy in developing countries has been a growing debate about whether the new opportunities, jobs and technologies available to individuals and firms are contributing to the development of new forms of exploitation. Conceptual frameworks that draw on the idea of value are useful to support these discussions by highlighting the distribution of value in the economy, pinpointing the sources of governance and those who shape the ways others gain value, by exploring the longer term trajectories of firms in terms of value and by highlighting the different ways value is created and captured.

As we have highlighted in terms of three key trends in developing countries around the platformization, growth of e-commerce and digitalisation, the digital economy can offer new opportunities and challenges. The way that value is divided may change, with an increasing emphasis on foreign platforms and data providers as leading firms in many sectors. For smaller firms and individuals, increasing digital- and data-driven control driven by these firms may limit the freedoms they have. Moreover, as leading firms grow they may find new ways to capture value from smaller firms who are often the main value creators. This analysis of changing value also implies a potential reduction in value for those firms or individuals that do not fully embrace the digital economy.

Many of these challenges appear solvable through appropriate legislation, support and interventions both at a local, regional and multilateral level. Where policy makers can make appropriate interventions there is a strong potential for firms to use the digital economy to modernise their processes and reach broader markets in more innovative ways. A framework of value can be particularly useful for policy makers by helping them assess the key potential focus of policy, and highlighting the trade-offs between short and longer terms growth, providing a starting point for assessing whether activities in the digital economy need to be regulated and how that might be done. These opportunities and challenges discussed in developing countries are likely to become more important as the digital economy expands. As such, ideas of value are likely to remain as a key approach to assessing the digital economy as it expands in the future.

8) References

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