

# Identifying Binding Constraints on Digital Payment Services in Ethiopia: An Application of a Decision Tree Framework

**Getnet Alemu, Tadele Ferede, and Alejandro Fiorito**

## Abstract

While several comparable countries in sub-Saharan Africa have seen a significant increase in financial inclusion, mainly driven by digital financial services, Ethiopia still performs poorly. Even digital payment and transfer services, which lower-income and less literate segments of the population could benefit from, are rarely used. Given the low development level of Ethiopia, numerous supply and demand factors could explain this disappointing outcome.

We use a decision tree framework to isolate and analyze potential constraints to find which are binding—that is, which constraints limit the expansion of digital payment services in Ethiopia. Our analysis indicates that supply-side problems are pervasive, and we find that competition problems in the essential digital infrastructure market and in the financial sector are responsible for the inadequate provision of digital payment services in Ethiopia.

However, the root cause of inadequate competition, and therefore of low financial inclusion through digital payment services, is institutional deficiencies. The two key institutional deficiencies are the lack of capacity of regulatory and supervisory institutions, and the unwillingness of the central government to enable and promote competition. The dominance of public enterprises, Ethio Telecom and the Commercial Bank of Ethiopia, has kept the prices of digital payment services high, particularly for low-income populations, as fees charged for undertaking low-value transactions are very high and the cost of digital infrastructure (mobile phones and plans) is also substantial. Unless these institutional binding constraints are removed, digital payment services in Ethiopia, and digital financial services more generally, will hit a very short ceiling that limits their enormous potential to improve livelihoods in the country.

Center for Global  
Development  
2055 L Street NW  
Fifth Floor  
Washington DC 20036  
202-416-4000  
[www.cgdev.org](http://www.cgdev.org)

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Getnet Alemu  
Addis Ababa University

Tadele Ferede  
Addis Ababa University

Alejandro Fiorito  
Center for Global Development

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**Center for Global Development**  
**2055 L Street NW**  
**Washington, DC 20036**

202.416.4000  
(f) 202.416.4050

**[www.cgdev.org](http://www.cgdev.org)**

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## Abbreviations

A4AI	Alliance for Affordable Internet
ATM	automated teller machine
CBE	Commercial Bank of Ethiopia
CSA	Central Statistics Agency
DFS	digital financial services
DPS	digital payment services
ECA	Ethiopian Communications Agency
ESS	Ethiopian Socioeconomic Survey
ETB	Ethiopian birr
GDP	gross domestic product
GNI	gross national income
ICT	information and communications technology
IMF	International Monetary Fund
KYC	know your customer
MFI	microfinance institution
MNO	mobile network operator
NBE	National Bank of Ethiopia
PoS	point of sale
PRIME	Pastoralist Areas Resilience Improvement through Market Expansion
RTGS	real-time gross settlement
SACCO	savings and credit cooperative organization
USAID	US Agency for International Development

Also, note that ISO 3 country codes are used as abbreviations in some graphs.

## Foreword

Financial inclusion, especially through digital means, is broadly regarded as a catalyst for development and a driver of economic inclusion. While a large number of countries have implemented policy changes to advance digital financial inclusion, results are mixed and there is a substantial divide between countries that have achieved great success and those that continue to lag behind.

To support policymakers' efforts to improve the effectiveness of their financial inclusion strategies, in early 2020 CGD published an analytical framework, *A Decision Tree for Digital Financial Inclusion Policymaking*, that allows a systematic identification of the most problematic constraints in country-specific settings. Many constraints can restrict financial inclusion, but to different degrees. Therefore, the *Tree* aims at diagnosing which constraints are binding, i.e., impeding significant usage of digital financial services. Without this kind of analysis, gaps in financial inclusion strategies may persist and policymakers may focus attention on non-binding constraints, obstacles whose solutions will not deliver significant improvements unless other first-order impediments are addressed.

The Tree methodology uses a deductive top-down approach to analyze various potential demand and supply causes (branches in the tree). An important feature of the analytical framework is that it calls for analysis of the observed (or shadow) prices of digital financial services to identify the most pressing (binding) constraints. Application of the methodology involves benchmarking with a wide-ranging set of indicators, including aggregate and micro-level statistics as well as survey data to reflect providers' and consumers' perceptions.

In this paper, Getnet Alemu, Tadele Ferede and Alejandro Fiorito apply the Tree methodology to the case of Ethiopia.

Ethiopia's financial inclusion levels are some of the lowest in the world and cash is the dominant payment method in the country, considerably above the already-high averages for sub-Saharan Africa. Moreover, the government has only recently started to recognize the importance of financial inclusion to improve the lives of the poor, and efforts to leverage the potential of digital means to further inclusion remain scarce.

As a starting point of their analysis, Alemu, Ferede, and Fiorito evaluate the costs involved in using digital payment services and find that the fees charged on mobile money are extremely high, particularly for low-value transactions, harming lower-income populations. Moreover, digital infrastructure prices (including the cost of mobile phones and the plans needed to use them) are also very high. This evidence signals the presence of binding constraints on the supply-side of the Decision Tree.

The authors' work confirms that the binding constraints are on the supply side. They find that competition in the provision of both digital financial services and digital infrastructure is scarce and public quasi-monopolies dominate both markets. Furthermore, this prevalent lack of competition is rooted in institutional deficiencies that are likely the binding constraints. Institutional problems are reflected in the severe lack of technical capacity in regulatory and



supervisory institutions and in the unwillingness by the central government, due to political and economic interests, to yield control of key industries. Lack of capacity and unwillingness intertwine and result in key sectors being practically closed to foreign investment, perpetuating uncompetitive markets. Thus, the Ethiopia case study offers a clear example of how the methodology enables analysts to understand complex dynamics by linking different tree branches and using a deductive approach.

While binding constraints in Ethiopia are markedly on the supply side, the authors find that demand-side constraints may be severe as well and even binding in some regions. For example, potential customers' perceptions of low benefits from using digital payments, related to very low awareness about the existence of these services, seems to be an issue in Afar. Moreover, the long distance that customers need to travel to reach providers can be a binding constraint in Somali and other rural and remote areas.

As the government starts to promote more competition in some industries, like the telecommunications sector where it recently allowed the entrance of a Safaricom-led consortium, solving the root causes of low digital financial inclusion by enhancing capacity and institutional quality will be essential.

This is the fourth in a series of five policy papers that employ the Decision Tree methodology that my colleagues and I developed to disentangle the most pressing constraints to financial inclusion in countries where the low levels of inclusion are truly concerning and a hindrance to prosperity. The other four papers study India, Indonesia, Mexico, and Pakistan.

To learn more about this project, find these papers, and read additional material, please visit [cgdev.org/page/policy-decision-tree-improving-financial-inclusion](http://cgdev.org/page/policy-decision-tree-improving-financial-inclusion).

Liliana Rojas-Suarez  
Director of the Latin America Initiative and Senior Fellow  
Center for Global Development

# 1. Introduction

The financial sector in Ethiopia is at its nascent stage, with very low levels of financial inclusion (NBE 2017). Only 12 percent of Ethiopian adults transact electronically by making or receiving payments through ATMs, mobile money, or other cashless delivery channels (Tadesse 2018). As of December 2020, the Ethiopian banking sector consisted of two public banks,<sup>1</sup> the Commercial Bank of Ethiopia (CBE) and the Development Bank of Ethiopia; 16 private commercial banks;<sup>2</sup> and 35 microfinance institutions (MFIs).<sup>3</sup> The financial sector is closed to the operation of foreign banks.

Financial inclusion, defined as the usage of financial services and products such as payments and transfers, savings, credit, and insurance at a cost affordable to poor people, is a critical factor for countries' growth and development. It facilitates resource mobilization for investment and helps to fight tax evasion and money laundering (Rafiq Raji 2020; Alliance for Financial Inclusion 2017).<sup>4</sup> The Ethiopian government has only recently fully recognized the importance of financial inclusion, however. It was in 2017 that the first National Financial Inclusion Strategy was launched and the National Council for Financial Inclusion established. The strategy aims to achieve universal access to and usage of a range of affordable and high-quality financial products and services by 2025—an objective that, given current trends, seems too ambitious. The Homegrown Economic Reform Agenda and the Ten-Year National Development Plan (2021–2030), both approved in 2019, prescribe digital transformation as a crucial engine in the improvement of financial inclusion. Even more ambitious is the digital transformation agenda approved in 2020, which is the first of its kind in the country. This strategy aims at achieving an inclusive digital economy and identifies infrastructure (connectivity and power), enabling systems (digital ID, digital payment, and cybersecurity), the mindset of society, and institutional capacity as key factors to lead the digital transformation strategy.

Financial inclusion in Ethiopia is very low, though improving. Since disaggregated data to differentiate between financial account ownership and usage are not available, in this paper we use account ownership as a proxy for account usage.<sup>5</sup> According to World Bank Findex data, the percentage of adults in Ethiopia with an account in a financial institution increased from 22 percent in 2014 to 35 percent in 2017 (World Bank 2018a). The gender gap widened in 2017, with 41 percent of men having an account compared with 29 percent of women,

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<sup>1</sup> In December 2015, the Construction and Business Bank merged with the Commercial Bank of Ethiopia and ceased operations.

<sup>2</sup> These are Abay, Abyssinia, Addis, Awash, Berhan, Buna, Cooperative Bank of Oromia, Dashen, Debu Global, Enat, Lion, Nib, United, Wogagen, and Zemen.

<sup>3</sup> The ownership structure of MFIs is mixed, with the big MFIs partially owned by regional states, some by NGOs, and some by private owners.

<sup>4</sup> For this paper, we define financial inclusion as usage, but broadly defined, it includes access and quality (see Alliance for Financial Inclusion 2017). See also World Bank (2018b).

<sup>5</sup> Since not all accounts are active and an individual can have multiple accounts from different banks, this method overestimates the included population.

and only 32 percent of rural adults had an account with a financial institution over the same period.<sup>6</sup>

The number of banks and their branches is small when compared with those in other developing countries. For instance, by 2020, Kenya and Tanzania had 42 and 38 commercial banks, respectively (Kescholars 2021; TanzaniaInvest 2021), with a single bank serving, on average, 1.28 million and 1.57 million people, respectively.<sup>7</sup> In the case of Ethiopia, with a population 2.14 and 1.92 times larger than Kenya and Tanzania, respectively, there were only 17 commercial banks, with a single commercial bank serving, on average, 6.76 million people. It should also be noted that there are also a number of foreign banks operating in Kenya and Tanzania, while this is not the case in Ethiopia.

Among financial services, those based on digital channels are used by a quite small proportion of the population. For example, in 2019/20, only 15.8 percent of the adult population had a mobile money account. The very low level of digital financial inclusion in Ethiopia and the lack of clear reasons for this disappointing outcome motivate this paper. In particular, the study focuses on digital payment services (DPS) with the main objective of assessing constraints on the demand for and supply of DPS and identifying, among those, which are binding—namely, the root cause(s) of the low usage of DPS. For this purpose, the study employs a decision tree methodology developed by Claessens and Rojas-Suarez (2020) as the main analytical framework.

The paper is organized as follows. Section 2 presents the landscape for DPS while Section 3 presents the analytical framework (the decision tree methodology) that will be used to identify binding constraints on the growth of DPS. Section 4 focuses on the analysis of prices associated with the usage of alternative DPS in order to get a first indication about the source of the most pressing constraints. Sections 5 and 6 assess each of the supply and demand constraints, respectively, identified in the decision tree as potential candidates to be binding, and Section 7 discusses coordination failures. Section 8 concludes.

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<sup>6</sup> The rural-urban divide is substantial, as more than 80 percent of adults without an account live in rural areas, while only 18 percent live in urban areas (CSA 2021).

<sup>7</sup> For population, the source is UN DESA (2019).

## 2. The digital payment services landscape

In the last 10 years there has been a historic bank branch expansion in Ethiopia (albeit from a small base). But entry to the banking sector is closed to foreign banks, and in recent years there have been no new banks joining the industry. As a result, the Ethiopian banking sector is not diversified enough in terms of the types of institutions delivering services and the types of financial products they offer.

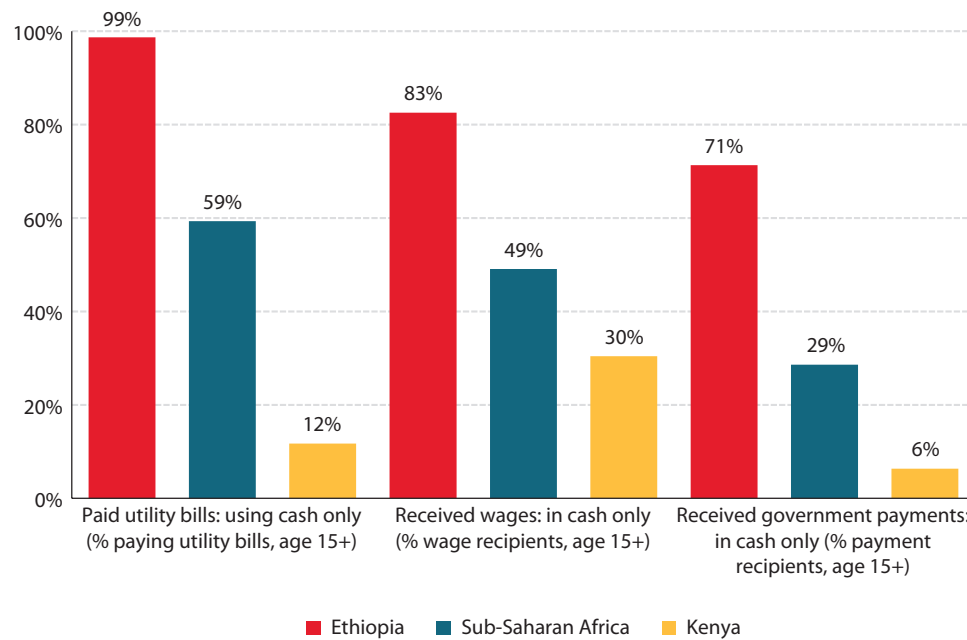
Overall, the financial system is quite underdeveloped.<sup>8</sup> Economic transactions are still largely cash-based, as digital financial services (DFS) have been introduced in Ethiopia only recently. Findex survey data (World Bank 2018a) illustrate the cash-based nature of the Ethiopian economy. For instance, in 2017, of the total adult population who paid for utilities, 98.7 percent paid in cash. In addition, although 59 percent of the adult population received payments for agricultural products, only 0.47 percent of these payments were through financial institution accounts. Figure 1 shows that Ethiopia is well above the average for sub-Saharan Africa in terms of using cash instead of formal financial institutions to pay utility bills, receive wages, and receive government payments. Kenya, the success story in the continent, shows the potential of DFS in advancing financial inclusion.<sup>9</sup>

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<sup>8</sup> There is no formal secondary market for existing financial instruments and bank shares. However, the NBE has prepared directives to develop capital markets and submitted them to the Council of Ministers. These directives are expected to be approved in early 2021. The interbank money market is not active, due to the lack of supportive monetary policy operations. Because of this, there is no central platform for all transactions; each bank, on its own, deals with other banks to borrow or lend. The foreign exchange markets are also not active and are heavily regulated by the government. Currently the foreign exchange market is managed only by the NBE, and daily transactions amount to a maximum of about US\$50,000, due to too much demand and limited foreign exchange. As a result, the participation of the general public is nonexistent. While government securities (T-bills and bonds) have been in place for some time (e.g., T-bills since 1996), the participation of the general public in these is also nonexistent. For instance, the general public can purchase T-bills starting from 5,000 Ethiopian birr (around US\$120), but so far there is no widespread participation, and T-bills are largely held by pension funds.

<sup>9</sup> Other comparator countries, such as Rwanda, Tanzania, and Uganda, also fare considerably better.

**Figure 1. Size of the cash economy, Ethiopia, sub-Saharan Africa, and Kenya, 2017**



Source: World Bank (2018a) adapted from Bessir (2018).

DFS include payments, transfers, remittances, savings, and insurance services that are accessed and delivered through digital channels such as Internet, mobile phone, automated teller machine (ATM), or point-of-sale (PoS) device. The use of digital channels improves access to and use of financial services by lowering costs for banks and other financial institutions (through reducing the need for brick-and-mortar branches) and for customers (through reducing transaction costs), increasing the speed of transactions, improving the quality of service, and covering a wide geography. In other words, DFS can boost financial inclusion.

Among DFS, this paper is focused on DPS, that is, mobile money, mobile banking, prepaid cards, debit/credit cards, and Internet banking. In contrast to other countries where DPS can be provided by financial and nonfinancial institutions, in Ethiopia these services are provided only by financial institutions, in particular by commercial banks and MFIs, a fact that may have adversely impacted the growth and expansion of DPS in the country. Recently the government recognized the problem, and aiming to correct it, the regulatory authority issued two new directives that allow nonfinancial institutions to engage in DFS (including DPS) as of mid-2020 (NBE 2020a, 2020b). It should be noted, however, that at the writing of this paper, no nonfinancial institution was offering DFS.<sup>10</sup>

The first DPS in the country was introduced in 2001 by CBE in the form of ATMs, with eight machines in the capital city of Addis Ababa. ATMs, however, were not effective nor

<sup>10</sup> In mid-May 2021, Ethio Telecom launched a mobile money service, making it the only nonfinancial institution to engage in mobile money.

accessible until 2013/14, when there was a significant expansion of the utilization of ATMs. Table A1.1 in Appendix 1 presents a list of the main providers in Ethiopia's DPS space and the products they offer.

ATMs in Ethiopia provide services such as cash withdrawal, transfer, and balance inquiry, but they do not provide cash deposit services. Tables 1 and 2 show the evolution of transactions using different services, by both value and volume, as well as the evolution of access points and ownership levels for different services, from 2013/14 to 2019/20. The amount of money transacted through ATMs increased substantially, from 7,332.3 million Ethiopian birr (ETB), equivalent to US\$374.5 million, in 2013/14 to ETB 142,067.6 million (US\$4,040.9 million) in 2019/20 (Table 1). Similarly, the number of transactions increased from 8.1 million to 153.2 million. Still, the development of ATMs relative to the market was slow (see Table 2), and although interoperability of ATMs for withdrawals by all banks was introduced in 2016, cash transfers using ATMs are still not allowed.

**Table 1. Number of transactions using DPS and their value in ETB**  
(values in parentheses are in US dollars; both currencies in '000s)

	2013/14	2014/15	2015/16	2016/17	2017/18	2018/19	2019/20
Number of transactions through ATMs	8,108	20,512	29,130	52,537	95,080	99,529	153,192
Amount of money transacted through ATMs	7,332,326 (374,536)	24,044,844 (1,169,161)	34,215,198 (1,569,476)	49,738,542 (2,152,429)	84,217,473 (3,073,810)	87,421,217 (3,008,767)	142,067,580 (4,040,936)
Number of transactions through PoS	288	262	597	478	354	2,260	1,359
Amount of money transacted through PoS	329,136 (16,812)	1,074,696 (52,256)	1,498,924 (68,757)	277,254 (11,998)	329,457 (12,025)	5,348,167 (184,067)	4,847,702 (137,887)
Number of transactions through mobile banking	15	128	1,264	3,362	3,258	4,698	11,623
Amount of money transacted through mobile banking	54,279 (2,773)	2,000,718 (97,283)	5,461,402 (250,518)	13,294,993 (575,339)	16,816,293 (613,769)	29,742,510 (1,023,645)	68,383,947 (1,945,096)
Number of transactions through mobile money	NA	NA	NA	NA	NA	2,310	4,242
Amount of money transacted through mobile money	NA	NA	NA	NA	NA	1,148,243 (39,519)	2,962,341 (84,260)
Number of transactions through Internet banking	1	8	35	61	108	256	525
Amount of money transacted through Internet banking	105,384 (5,383)	422,403 (20,539)	1,274,386 (58,457)	1,810,342 (78,342)	5,155,868 (188,181)	14,981,498 (515,617)	22,546,333 (641,302)
Exchange rate (US\$/ETB)	19.5771	20.5659	21.8004	23.1081	27.3984	29.0555	35.1571

Source: National Bank of Ethiopia.

Note: NA = not applicable.

**Table 2. DPS facilities and users per 100,000 adults<sup>11</sup>**

	2012/13	2013/14	2014/15	2015/16	2016/17	2017/18	2018/19	2019/20
<b>Access points</b>								
Number of mobile phone subscribers	50,949	58,658	78,879	92,584	69,488	71,387	72,799	71,472
Number of Internet subscribers	8,799	11,870	17,599	24,565	28,971	37,975	37,598	38,226
Number of commercial bank branches	3.4	4.2	5.0	6.0	7.5	8.1	9.2	9.8
Number of bank agents	0.0	0.0	0.7	4.0	8.1	16.6	21.3	36.5
Number of ATM machines	0.0	1.7	2.3	3.1	4.8	5.3	8.1	10.1
Number of PoS machines	0.0	2.6	6.2	14.7	15.6	16.5	14.8	15.7
<b>Ownership</b>								
Number of mobile money users	NA	NA	NA	NA	NA	NA	5,951	12,781
Number of mobile banking users	18	231	858	2,364	4,265	4,578	7,484	14,679
Number of Internet banking users	0.4	3.4	18.5	67.6	138.6	205.3	905.5	2,340.8
Number of debit card users	1,290	2,817	4,343	6,511	11,202	11,833	18,577	25,747
Number of prepaid card users	0.2	0.4	1.3	22.1	64.3	88.6	96.1	163.5

*Source:* NBE annual reports (various years) for DPS, and CSA (2013) for population projection.

*Note:* NA = not applicable.

After the approval of ATMs in 2001, it took the NBE about 10 years to approve another form of DPS, the PoS device. The CBE introduced PoS terminals<sup>12</sup> in 2011/12, deploying around 206 of them as a pilot in some major locations. All but four commercial banks (see Table A1.1 in Appendix 1) have PoS terminals in different commercial areas, and the number of terminals increased to 9,780 in 2019/20 from just 1,354 in 2013/14. Similarly, the amount of money transacted by PoS increased from EBT 329.1 million (US\$16.8 million) in 2013/14 to EBT 4,847.7 million (US\$137.9 million) in 2018/19 (see Table 1). Interoperability of PoS terminals was started as late as September 2020.<sup>13</sup>

The number of debit card users is also small but improving. It has increased from 0.65 million in 2012/13 to 16 million in 2019/20—from 1.3 percent of the adult population to 25.7 percent (see Table 2). However, out of 52.5 million bank account holders, only 16 million (30 percent) are using debit cards.<sup>14</sup> Credit cards are not in operation in the

<sup>11</sup> *Adult population* refers to those 15 and older.

<sup>12</sup> A PoS terminal is a technology-based machine where customers make payments in exchange for goods or services.

<sup>13</sup> This happened after the NBE approved the full-scale commercialization of PoS purchase services following months of pilot test involving participant banks.

<sup>14</sup> This is as of June 30, 2020. The data from the NBE claim that 71.5 percent of the adult population (nearly half of the total population) have a bank account. It should be noted, however, that industry experts view this figure as suspect because of multiple counting. It is not uncommon for an individual to have multiple accounts. Furthermore, there could be dormant accounts. As there are no disaggregated data, we use ownership of an account as a proxy for usage. Likewise, we use ownership of a debit card as a proxy for usage. The numbers we provide are therefore, naturally, an overestimation of actual usage.



country as the current payments system does not allow for them. All commercial banks require 100 percent collateral for the loans they provide, and credit cards are not defined in the legislation as a specific type of credit service. While the NBE is working on these issues,<sup>15</sup> there is no policy, directive, or guideline that defines consumer loans. Ethiopia also does not have cards that are functional or acceptable in the rest of the world, which is also related to restrictions on capital account movements, as Ethiopian citizens are not allowed to open foreign-currency accounts.<sup>16</sup> It should be reiterated that in Table 2, and throughout the document, we use ownership (of an account, card, etc.) as a proxy for usage, given that there are no available disaggregated data.

With the exception of Debub Global Bank, all commercial banks provide Internet banking services (Table A1.1 in Appendix 1).<sup>17</sup> Internet banking has been operational in the country since 2008—United Bank was the first to introduce it, and later all other banks joined the service. The CBE, the largest commercial bank in the country, launched Internet banking services in June 2012. In 2013/14, there were only 1,771 Internet banking users, while there was a total of 6.2 million Internet subscribers. This has increased to 1.457 million Internet banking users in 2019/20, but it is still very small when compared with total Internet subscribers (only 6.1 percent), and the share of the adult population (ages 15 and higher) using Internet banking was as low as 2.3 percent in 2019/20 (Table 2).

The value of transactions through Internet banking has increased from ETB 105.4 million (US\$5.4 million) in 2013/14 to ETB 22,546.3 million (US\$641.3 million) in 2019/20 (Table 1). Despite this development, one still cannot make transfers from one bank to another using Internet banking—that is, there is no interoperability.

Mobile banking, also introduced in 2008/09 by United Bank, is another form of DPS, whereby mobile phones can be used by banks' customers to access their accounts and execute financial transactions, including payments, transfers, and balance inquiries, as well as get instant notifications through SMS of any transaction on all the accounts linked with the mobile banking service. Mobile banking platforms in Ethiopia have acquired a total of around 9.14 million customers to date, with 16 commercial banks. These numbers are considered quite low for a country with a population of over 100 million people, 44.5 million mobile phone subscribers, and 52.5 million commercial bank account holders. Although the proportion of mobile banking users relative to the adult population was as low as 0.2 percent in 2013/14, it has increased to 14.7 percent in 2019/20 (Table 2). Yet, the overwhelming majority of mobile subscribers are not using mobile banking: only 20 percent in 2019/20.

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<sup>15</sup> The NBE has recognized this problem and will work to address it in the near future (interview with principal, Payment Systems Oversight and Development, NBE).

<sup>16</sup> Recently, the CBE has been piloting a prepaid card that allows people visiting abroad to get foreign currency from the CBE loaded onto it. Foreign credit cards, however, are acceptable in the country. Credit cards (Visa and MasterCard) are acceptable in Addis Ababa (at ATMs and PoS sites) but are rarely accepted outside it, with the exception of some Ethiopian Airlines offices and top-class hotels. These are clear signs of the closed nature of the Ethiopian economy.

<sup>17</sup> *Internet banking* refers to an electronic payment system that enables customers of a bank or other financial institution to conduct a range of financial transactions through the financial institution's website.



Another form of DPS operated in Ethiopia is mobile money. Mobile money is an electronic account linked to a mobile phone number (no need to open an account at the bank) that allows people to deposit, withdraw, and transfer money as well as make and receive payments.<sup>18</sup> As the DPS in Ethiopia is not telecom-based, DPS are not integrated with Ethio Telecom, the state-owned and sole provider of mobile and Internet services.<sup>19</sup> As a result, mobile money accounts (electronic accounts) are not embedded in mobile phone SIM cards.<sup>20</sup>

Commercial banks have an agent banking system whereby bank branches authorize agents<sup>21</sup> to provide mobile money services on their behalf. MFIs are also providing mobile money services. The country's first mobile money service, called M-Birr,<sup>22</sup> was introduced in 2012 by five partnering MFIs working in Addis Ababa and four regional states,<sup>23</sup> and it became operational in 2013. M-Birr provides deposit/withdrawal services at an agent, as well as the ability to top up mobile airtime, pay bills, buy goods, repay loans, check balances, and get statements using a mobile phone. It also provides transfer services across the five MFIs, as they use one switch system.

These MFIs provide financial access for those with no access to banking services. As M-Birr does not require an Internet connection and works with low-quality mobile networks, it is critical to the country, where nearly 80 percent of the population resides in rural areas with poor connectivity.

Following the introduction of M-Birr, Lion International Bank and Somali Micro Finance Institution, in partnership with BelCash, launched a mobile money service called HelloCash in February 2015. It offers deposits, withdrawals, transfers, and payments.<sup>24</sup> The banks select, train, and authorize agents to provide mobile money services on their behalf. In mid-December 2017, the CBE launched a mobile phone-based money transfer platform called

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<sup>18</sup> According to the Global System for Mobile Communications Association (GSMA 2020), a service is considered a mobile money service if (1) it enables transferring money and making and receiving payments using the mobile phone; (2) it is available to the unbanked, that is, people who do not have access to a formal account at a financial institution; and (3) it offers a network of physical transactional points that can include agents, outside of bank branches and ATMs, that make the service widely accessible to everyone.

<sup>19</sup> In May 2021, after this paper was written, the government announced it had approved a license for a Safaricom-led consortium to enter the telecom market in 2022. We explore the implications of this in footnote 35 in section 5.1.

<sup>20</sup> Because of this, the electronic account is opened using the name of the mobile phone user and not necessarily the name of the person who registered as owner of the phone at Ethio Telecom.

<sup>21</sup> *Agent*, in this context, means a person contracted by financial institution to facilitate provision of agency business service in the name and on behalf of a financial institution.

<sup>22</sup> Moss ICT is the technology firm that supports the M-Birr service. Users open an M-Birr account at a financial institution or an agent by simply registering and submitting a copy of their ID. An agent can be any kind of business, such as a shop, a gas station, a restaurant, and so on.

<sup>23</sup> These are Addis Credit and Saving Institution, Amhara Credit and Saving Institution, Dedebit Credit and Saving Institution, Oromia Credit and Saving, and Omo Microfinance Institution—all MFIs, which offer financial services to individuals who lack access to conventional banking services. Ethio Telecom is not allowed by law to provide financial services directly, and as a result, the M-Birr service is co-owned by MFIs.

<sup>24</sup> Shortly afterwards, Cooperative Bank of Oromia joined the partnership.

CBE-Birr, whose customers enjoy additional functionalities, as they can deposit, withdraw, transfer, make payments, buy mobile airtime, and pay bills using their mobile phones. In July 2018, Dashen Bank launched a mobile phone-based money transfer platform called *Amole*.<sup>25</sup>

Recently, some banks have introduced new facilities that link an electronic mobile money account with a bank account. This has made life easier for mobile money users who have bank accounts (but only for those who have smartphones). These users no longer need to go to agents or bank branches to deposit money, as they now can simply load money into their electronic account from their bank account using a mobile phone.<sup>26</sup> This has encouraged many bank account holders to use mobile money services and also encouraged mobile money users to open bank accounts. In turn, it has facilitated settling bill payments easily. Currently, 13 commercial banks (see Table A1.1 in Appendix 1) are contracting with agents authorized to open accounts and conduct know-your-customer (KYC)<sup>27</sup> procedures electronically. Most of them are also providing mobile money services through their branches.

Unlike Internet and mobile banking, mobile money has become a popular alternative as it does not require Internet access nor a high-value mobile phone (a smartphone). Despite the availability of this easy and popular alternative, mobile money platforms in Ethiopia are relatively small, but growing fast. By 2019/20, mobile money providers had attracted only around 7.96 million users (12.8 percent of the adult population, still more than double the number in 2018/19) and around 22,725 agents. The amount of money transacted through mobile money for the last two years has also increased, albeit from a small base, from ETB 1,148.2 million (US\$39.5 million) in 2017/18 to ETB 2,962.3 million (US\$84.3 million) in 2019/20 (Table 1).

It should be noted, however, that these figures refer only to mobile money services provided by commercial banks and their agents. The number of mobile money customers of MFIs and the amount of money transacted (mostly through M-Birr) is 8.2 times the mobile money figure mentioned above. For instance, in fiscal year 2019/20, 2.44 million MFI mobile money subscribers made 15.95 million transactions, worth ETB 24.29 billion (US\$775 million). Nevertheless, the NBE is not using these numbers due to inconsistency and reliability problems.<sup>28</sup>

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<sup>25</sup> The name *Amole* comes from the salt bar currency used in ancient Ethiopia.

<sup>26</sup> The transfer goes only one way, from bank account to mobile money account.

<sup>27</sup> Agents face regulatory rules like any other payment service provider, particularly around KYC rules. The world's financial regulators, working through the Financial Action Task Force, have agreed to a set of minimum standards for the provision of financial services, in order to prevent money laundering and terrorist financing. A basic tenet of these standards is verifying the identity of a customer before opening a financial account and conducting transactions. There is no national ID system in Ethiopia.

<sup>28</sup> The principal of the Payment Systems Oversight and Development Department of NBE informed us in early 2021 the NBE will focus on this and fix the problem in consultation with MFIs, setting the ground for clean and reliable data to be sent to NBE on a regular basis.

The number of access points for DPS in the country is very low (Table 2). Ethiopia had only 8.1 ATMs for 100,000 adults by 2019. When compared with some neighboring countries like Djibouti (12.33 ATMs per 100,000 adults), Ethiopia seems far behind. When compared with Kenya (7.69 ATMs per 100,000 adults),<sup>29</sup> however, Ethiopia seems to be catching up. It should be noted, though, that the low number of ATMs in Kenya is due to the high access to mobile banking and mobile money.<sup>30</sup> Yet, what is even more worrying in Ethiopia is that most ATMs are in big urban centers leaving about 80 percent of the population living in rural areas with limited access.

To recap, a lot remains to be desired with regard to financial inclusion and DPS in Ethiopia. The number of transactions through all digital means is very limited but improving. The amount of money transacted through all available digital means was only 7 percent of GDP and 23 percent of broad money in 2019/20, much lower than in comparable countries. In Kenya, for instance, transactions between 2016 and 2017 through mobile money alone constituted almost half the country's GDP (Dubale 2019). Unlike in neighboring countries, DPS in Ethiopia is not based on fintech (financial technology) or telecom but operates as a bank-based model.

Overall, DFS in Ethiopia have remained underdeveloped, and a large share of the population is left behind in terms of both access to and usage of such services. This calls for identifying, in a holistic way, the main reasons and barriers that cause the low usage of DPS in Ethiopia.

### **3. Methodology**

#### **3.1. Analytical framework**

As noted above, existing statistics indicate that both access to and usage of DPS have remained low in Ethiopia. What constraints can explain this outcome? And among those constraints, which ones are binding?

To address these questions, we use the methodology developed by Claessens and Rojas-Suarez (2020) to assess potential constraints arising from the supply of and the demand for DPS, and to identify which are binding. The framework presents a decision tree that follows a top-down approach to identify the relative importance of different constraints that hinder improvements in digital financial inclusion (Figure 2). Starting with an aggregate outcome, the documented low level of financial inclusion in Ethiopia, we explore the different potential causes (represented in the branches of the tree) of this disappointing result. The upper-level branches of the tree show general causes of low financial inclusion, which in turn can be

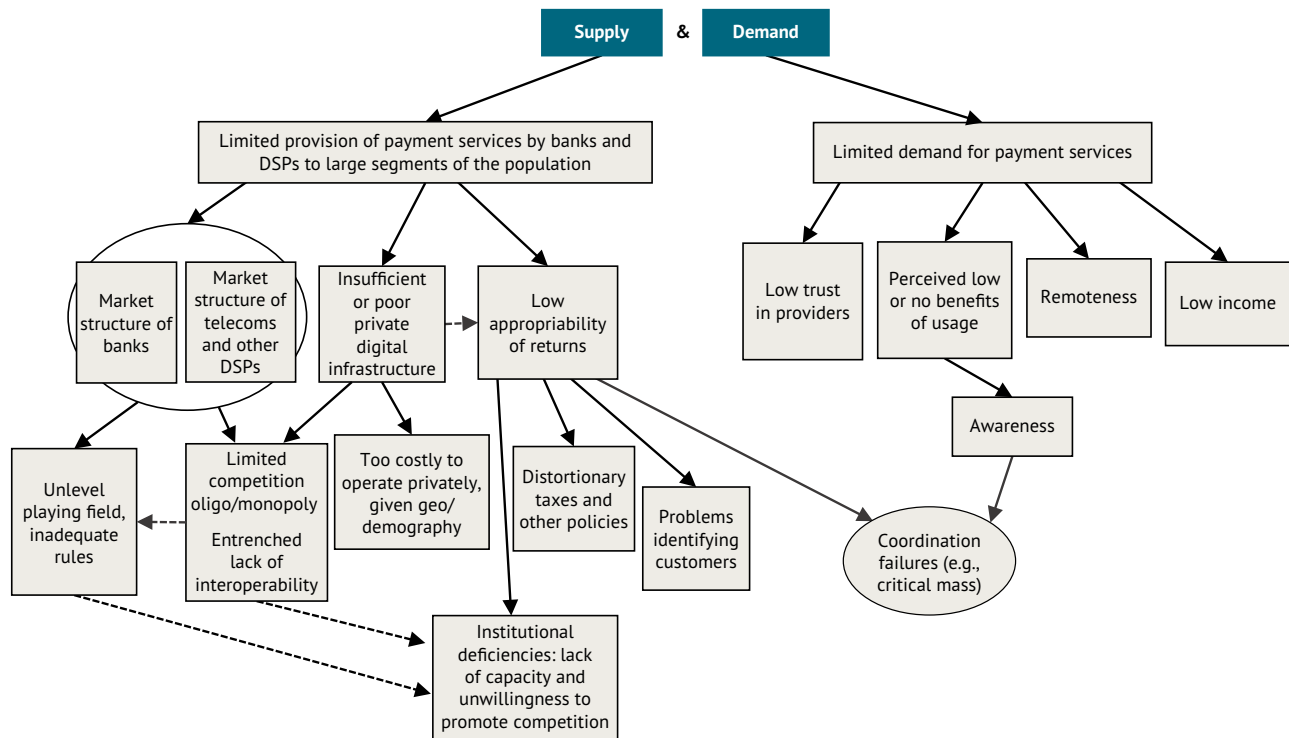
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<sup>29</sup> Source for Djibouti and Kenya is World Bank (2021a).

<sup>30</sup> Mobile money and agency banking have eclipsed the use of ATMs in Kenya. Banks have consequently been forced to reduce the number of ATMs across the country, with the number of the machines falling to a six-year low at the close of 2019 (Xinhuanet 2020).

explained by additional factors that are in the lower-level branches. Following a deductive approach, and applying the principles of the methodology, which are presented below and further developed in Appendix 2, this framework guides our search for the binding constraints on DPS.

**Figure 2. Determinants of inadequate financial inclusion and use of DPS**



Source: Claessens and Rojas-Suarez (2020).

Note: DSP = (nonbank) digital service provider.

The tree divides constraints into those related to demand and supply factors. The upper-level branches of the tree on the supply side include poor digital infrastructure, market structure problems (of both banks and telecoms), and difficulties faced by providers with appropriating the returns from their investments. These issues, in turn, can be due to lack of competition, an unlevel playing field between alternative providers of DPS, costly operation of digital infrastructure by the private sector, institutional deficiencies, distortionary policies, or problems verifying the identity of customers. Moreover, as the dashed line indicates, branches such as lack of competition and poor institutional quality (institutional deficiencies) can be linked.

Factors on the demand side include lack of trust in providers (potentially related to customer insecurity), perceptions of low benefit from using DPS (which could be associated with awareness issues), low income, or remoteness from providers. Moreover, a potential factor constraining the usage of DPS is the emergence of coordination issues, which arise when demand and supply factors interact to prevent the market for DPS from reaching the necessary scale to make the business model profitable. All of these factors will be assessed in detail in this and following sections.

### **3.2. Finding binding constraints: Principles and indicators**

This study uses the principles outlined in the decision tree methodology to identify the binding constraints from both the demand and supply sides. Building on the original work of Hausmann and others (2008) and that of Claessens and Rojas-Suarez (2020), four principles can be used to assess the importance of alternative constraints and determine which are binding, depending on availability of data.

The first principle of the methodology, and a central one, emphasizes the importance of using prices to distinguish demand from supply constraints. Low usage alone does not serve to identify whether a constraint is on the demand or supply side; prices are the key indicator to make such a distinction. High prices and low usage suggest that constraints are likely present on the supply side, since providers are willing to offer DFS only at a high price (due to elevated costs and/or distortionary policies), which is unaffordable for a significant segment of the population. On the other hand, low prices and low usage indicate that the constraints are likely on the demand side, implying that customers are unable or unwilling to use a service despite it being affordable.

According to the second principle, a constraint would be generally considered binding if there is evidence that its relaxation or removal would lead to significant improvement in the use of DPS. The third principle is that if certain groups affected by the constraint are trying to bypass it (by finding alternative services, for instance), this might be an indication that the constraint is binding. The fourth principle notes that we would expect agents in the economy that are not affected by the constraint to thrive and outperform those that are affected by the constraint.

The methodology requires identifying relevant indicators for each DPS and each branch of the tree, and then applying these principles to them. However, it should be noted that the paucity of information on DPS may not allow for a deep analysis of the nature and severity of certain constraints on DPS in Ethiopia.

### **3.3. Testing for binding constraints: Benchmarking**

Although initially, demand- and supply-side constraints both seem to be at play in Ethiopia, in relative terms, some constraints warrant more attention than others. Benchmarking against comparator countries can be a useful approach to determine which ones should be studied in depth. We use the following criteria to select comparator countries:

1. Front-runners in the use of DPS, that is, countries that have outperformed Ethiopia in financial inclusion
2. Countries with similar socioeconomic conditions, such as economic structure, market size, and so on
3. Countries with a similar policy environment and geography
4. Data availability

Based on the above criteria, we selected Kenya, Tanzania, Rwanda, and Uganda as the main comparators in Africa. Kenya has witnessed a remarkable expansion in access to financial services in recent years and is, therefore, a pertinent comparator and a relevant model. In particular, Kenya is known for its success in DFS expansion, mainly through the mobile money sector (Pazarbasioglu et al. 2020).<sup>31</sup> Similar to Ethiopia, Tanzania has the challenge of a predominantly rural population that is often removed from DFS and digital infrastructure and has a history of imposing capital controls. Rwanda and Uganda, like Ethiopia, are landlocked countries with similar levels of development. In addition, a few non-African countries are used as comparators, also selected based on the above criteria.

Following the first principle from the methodology, the next section is dedicated to price analysis in order to understand whether binding constraints are likely on the supply or the demand side.

## **4. Analysis of prices and fees**

This section analyzes price structures for selected DPS. Due to data limitations, the analysis of prices and fees is focused on ATMs and mobile money services.

### **4.1. ATM fees and costs**

EthSwitch, Ethiopia's national switch, owned by a consortium of all banks, was established in 2011 to provide e-payment services. The platform sets maximum fees that banks can charge for ATM services, which have to be approved by the NBE (Table 3). For instance, EthSwitch sets a maximum of ETB 0.5 per ETB 100 for customers to withdraw and transfer using ATMs. Thus, fees charged by banks for withdrawals from their own ATM network vary across banks and range from 0 percent of the value of the transaction to 0.5 percent. In contrast, fees to withdraw from ATMs owned by other banks are the same across commercial banks (0.5 percent of the value of the transaction). For CBE debit card holders, the cash withdrawal fee from ATMs owned by CBE is fixed at 0.2 percent of the transaction value. Unlike other commercial banks, Zemen bank does not charge fees for its own customers to make cash withdrawals from its ATMs. With the exception of Berhan Bank, there are no fees for cash transfers within the same bank. Note that there are no facilities for interbank cash transfers using ATM cards in the country.

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<sup>31</sup> The recent study by Pazarbasioglu and colleagues (2020) indicates that there were 58.3 million mobile wallets in Kenya, representing 1.7 mobile wallets for every adult, in 2019. Kenya's digital payment system is driven by the private sector.

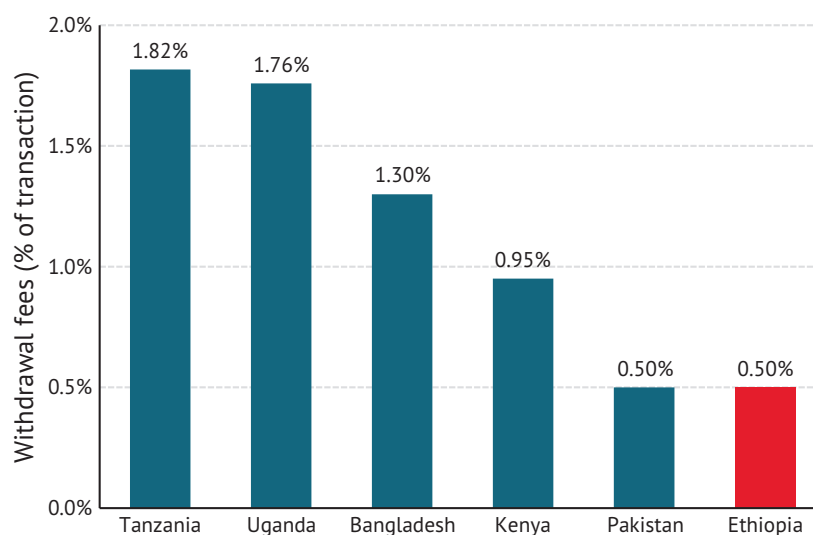
**Table 3. ATM withdrawal and transfer fees (percentage of transaction), 2020**

Commercial bank	Cash withdrawal from own bank	Cash withdrawal from other banks	Cash transfer within same bank
Abay	0.5	0.5	0
Addis International	0.25	0.5	0
Awash	0.25	0.5	0
Berhan	0.5	0.5	0.5
Buna	0.5	0.5	0
CBE	0.2	0.5	0
Dashen	0.25	0.5	0
Nib	0.25	0.5	0
Oromia	0.2	0.5	0
United	0.25	0.5	0
Wegagen	0.25	0.5	0
Zemen	0	0.5	0

*Source:* The respective commercial banks.

Figure 3 compares Ethiopian banks' ATM fees (as percentage of the value of the transaction) with those of other countries. The average ATM withdrawal fee (in percentage terms) for Ethiopia (across nine commercial banks) is one of the lowest among the countries compared, with Tanzania and Uganda being the highest.

**Figure 3. Comparison of ATM fees for cash withdrawal, Ethiopia and comparators, 2017**



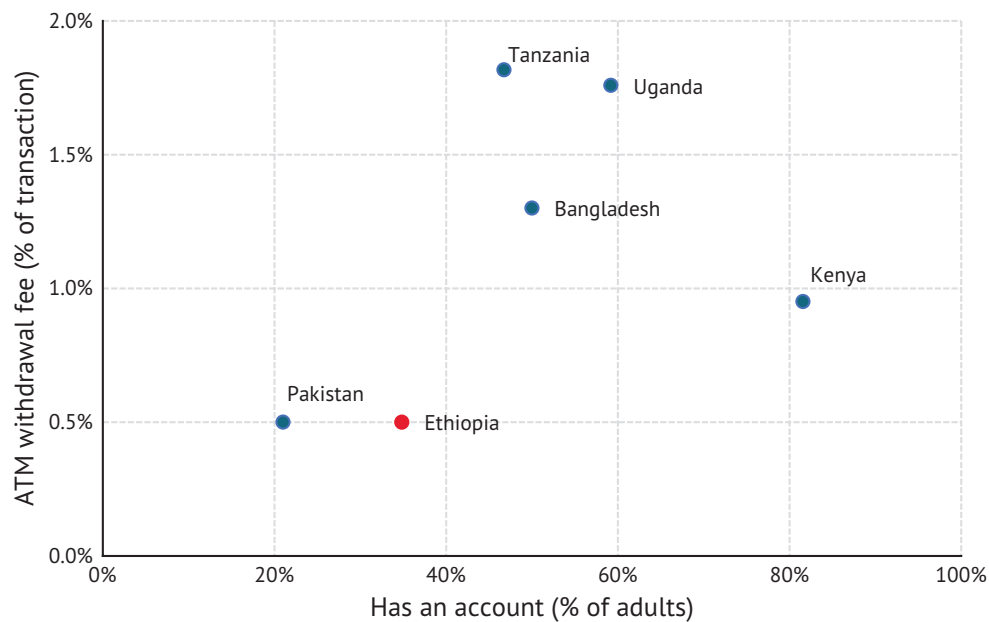
*Source:* For Ethiopia, EthSwitch published fee structure;<sup>32</sup> for other countries, Cook et al. (2017).

<sup>32</sup> Fees have not changed since 2012/13.



Next, we look for any relationship between ATM fees (again as a percentage of the transaction) for withdrawing money from other banks and the proportion of adults having accounts (Figure 4). Ethiopia has very low ATM fees, but the proportion of adults who own accounts remains low. Countries such as Tanzania, Uganda, and Bangladesh have relatively high ATM fees, but between 45 percent and 60 percent of adults own accounts, nevertheless. Banks in Kenya charge relatively low ATM fees and have a large share (about 81 percent) of adults with accounts—a much larger share than Bangladesh, Tanzania, and Uganda. Thus, low ATM fees in Ethiopia suggest that binding constraints on the provision of ATM services might not be attributable to supply-side factors—still, there could be other constraints at play for these services.

**Figure 4. ATMs fees and household financial access, 2017**



*Source:* World Bank (2018a) for account ownership; local commercial banks for ATM fees in Ethiopia; Cook et al. (2017) for other countries.

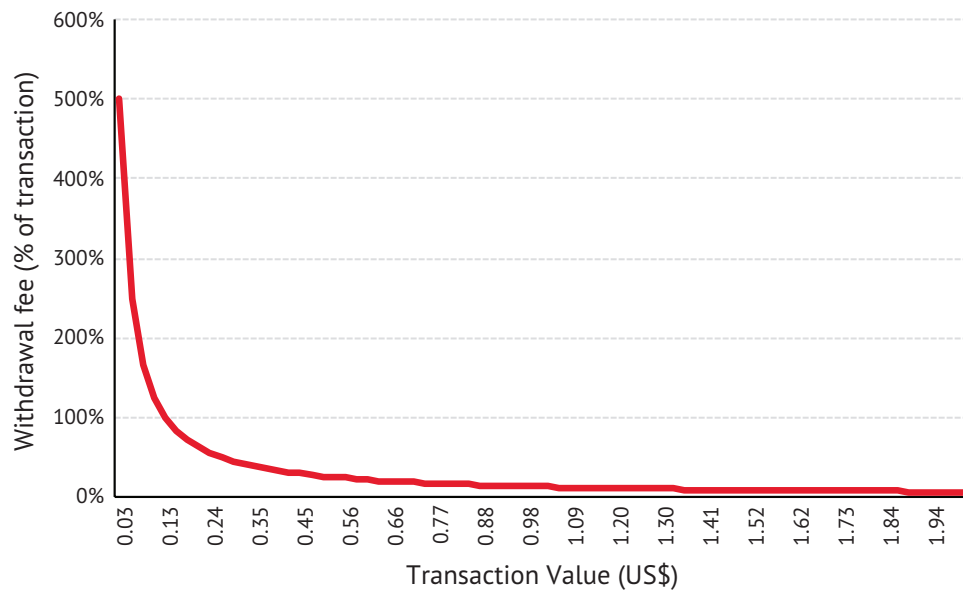
## 4.2. Mobile money

Although mobile money services are increasingly filling the gaps left by traditional services, their utilization depends on the cost of services, the reliability of mobile networks, and the quality and suitability of the services. As for costs, there are three types of mobile money fees: deposit, withdrawal, and transfer. In Ethiopia, fees vary across digital platforms; some providers, such as Awash Mobile Wallet, CBE-Birr, and M-Birr, have a regressive fee structure for all three types of transactions. For instance, both withdrawal and transfer fees decline as a percentage of the transaction value. For M-Birr, the first and largest mobile money service in Ethiopia, withdrawal fees are very high for smaller transactions, compared



with larger transactions (Figure 5).<sup>33</sup> While the transaction values illustrated in Figure 5 are small, such amounts are common among poor people. Note also that M-Birr is mainly provided by MFIs, whose clients are mainly the poorest segments of the population, for whom the transfer of a small amount is not unusual.

**Figure 5. Mobile money withdrawal fees, M-Birr, 2020**



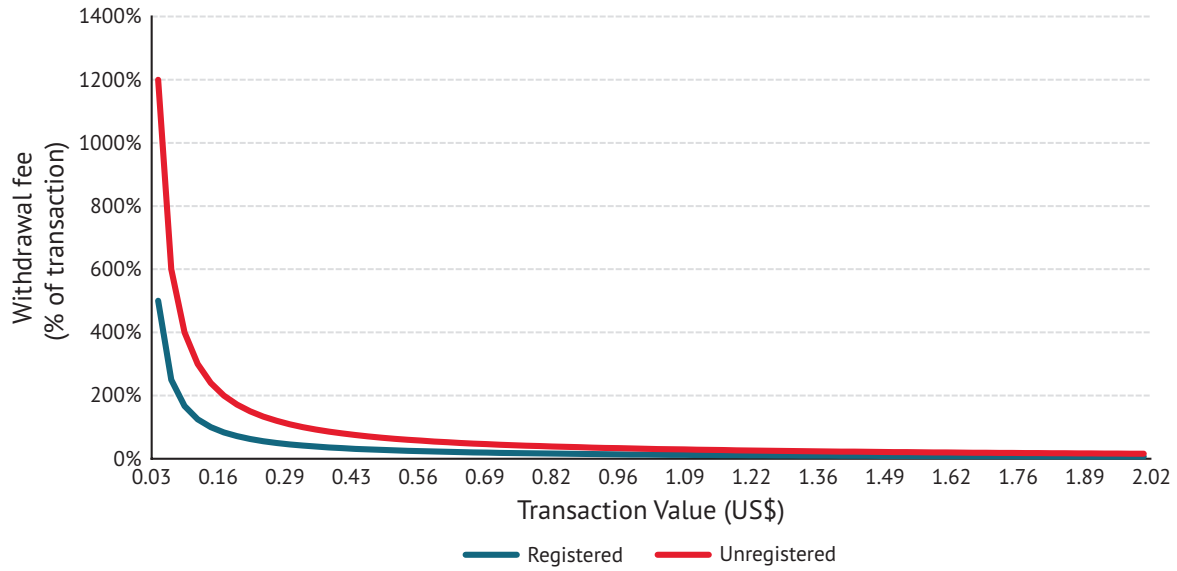
Source: M-Birr.

Figure 6 presents M-Birr transfer fees for registered versus unregistered customers in 2020. Fees are lower for registered customers than for those without an M-Birr account.<sup>34</sup> Registered customers pay the same percentage for a transfer that they pay for a withdrawal.

<sup>33</sup> Introduced in 2015, M-Birr is the largest mobile money service in Ethiopia, provided in cooperation with the largest MFIs, including the Amhara Credit and Saving Institution, Dedebit Credit and Saving Institution, Oromia Credit and Saving, Omo Microfinance Institution, Addis Credit and Saving Institution, and the Poverty Eradication and Community Empowerment Microfinance Institution (EIB 2019). Unlike other mobile money platforms, M-Birr has a large customer base and reaches remote areas, as it is partnered with a number of MFIs that have large membership bases in both urban and rural areas. For example, there are more than 1,000 M-Birr agents in Addis Ababa alone.

<sup>34</sup> See <https://www.mbirr.com/pricing/>.

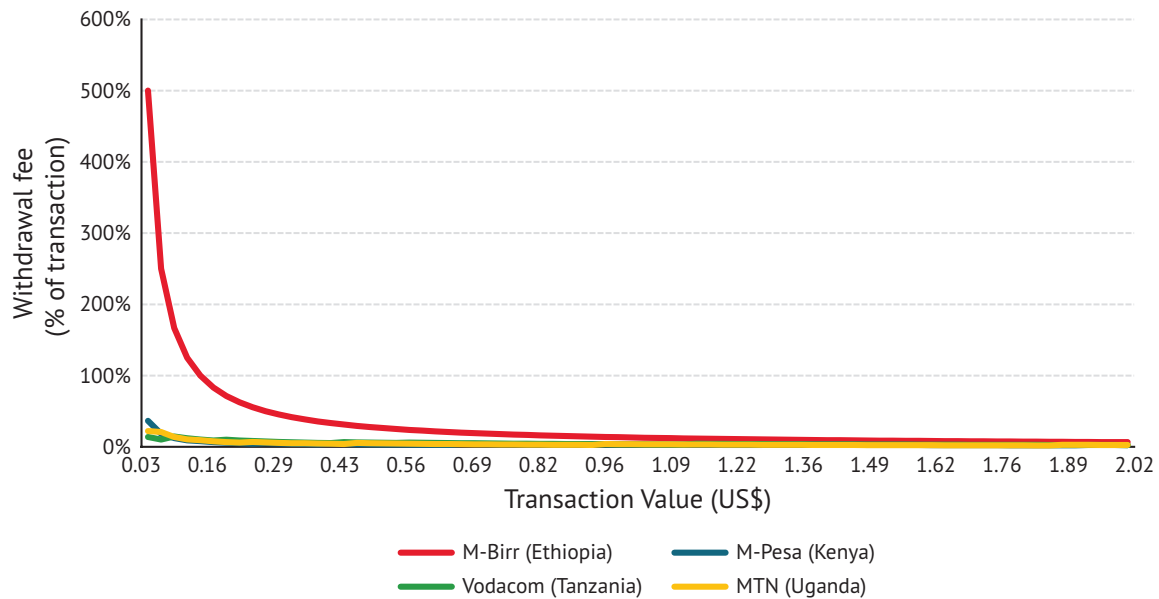
**Figure 6. Mobile money transfer fees, M-Birr, 2020**



Source: M-Birr.

Transfer fees in Ethiopia are higher than in the selected East African countries of Kenya, Tanzania, and Uganda (Figure 7). In particular, transfer fees are much higher for lower-value transactions in Ethiopia. Although fees decline in all countries as transaction amounts increase, the decline is clearly slower in Ethiopia.

**Figure 7. Comparison of transfer fees, various years**



Source: M-Birr for Ethiopia (2020); Cook et al. (2017) for comparator countries.

The high mobile money transfer fees in Ethiopia, relative to comparator countries, hint at the presence of binding supply-side constraints that limit the usage of this service. In the following two sections, we seek to test the validity of that signal by analyzing potential constraints affecting both the supply of and the demand for DPS.

## **5. Supply-side constraints on digital payment services**

This section presents an in-depth analysis of supply-side barriers to explain the low provision of DPS by banks and other service providers in Ethiopia. The decision tree framework identifies a number of supply-side constraints that could potentially be binding, including poor private digital infrastructure, constraining features of the market structure (the degree of competition and the legal framework that governs the operations of banks, telecom, and other digital service providers), and problems providers face regarding the appropriability of returns from their investments (caused by poor institutions, distortionary taxes, and/or difficulty in verifying the identity of customers). In addition, we consider coordination problems affecting both suppliers and customers.

As shown in Figure 2, there are additional interrelations between some branches of the decision tree in Ethiopia. These connections will become apparent in the discussion in this section.

### **5.1. Low provision of digital infrastructure**

Making DFS markets work for financial inclusion requires adequate investment in digital infrastructure. This section aims to provide an assessment of the provision and usage cost of digital infrastructure in Ethiopia based on an international comparison, focusing mainly on digital infrastructure for telecom.

As shown in Section 2, Ethiopia has a low demographic penetration of ATMs (and bank branches) compared with countries such as Bangladesh, Pakistan, Ghana, and Kenya. At fewer than 5 machines per 1,000 square kilometers, the geographic penetration of ATMs has also remained very low in Ethiopia. Discussions with stakeholders indicate that the cost of investing in ATMs is even higher than that of investing in branch expansion, further hindering the promotion of digital financial inclusion. This suggests that addressing financial inclusion through digital platforms such as mobile money is necessary to boost access to banking and the financial system in the country. Thus, analyzing the provision of digital infrastructure by telecoms is extremely relevant in the Ethiopian context.

As previously noted, the state-owned Ethio Telecom is the sole telecommunications service provider in the country. It provides both information and communications technology (ICT) infrastructure and other telecom services with no competition in the digital domestic infrastructure market. It offers both prepaid and postpaid mobile services through mobile phones' SIM cards. In 2018, the government of Ethiopia announced a plan to privatize major state-owned enterprises, including Ethio Telecom (Maasho 2018). Partial ownership

of Ethio Telecom would be transferred to foreign telecom companies (to generate foreign exchange), as well as a small share to Ethiopian nationals, with the government retaining majority ownership. At the same time, the government would allow some domestic firms to provide digital services, relaxing the public monopoly in telecommunications. While this will be only a partial privatization, opening the telecom market to private-sector competition and foreign investment could potentially enhance competition, improve the quality of telecom services, expand usage, provide more choices for customers, and improve the inflow of foreign currency.<sup>35</sup>

However, as of the writing of this paper, the partial privatization has not been completed, and Ethio Telecom is likely to maintain its dominant position in the market, given that the government restricts investments by independent cell tower companies and forces new entrants to use Ethio Telecom's infrastructure (Dione 2021). Additional unlevel playing field issues (for digital infrastructure and DSP) are addressed in the next section.

Two factors explain this flawed market structure. First, the government has shown a marked interest in keeping control of the telecommunications sector for both economic and political reasons. Second, the capacity to implement successful reforms is limited. Regulatory institutions such as the NBE and the Ethiopian Communications Agency (ECA) lack the necessary supervisory capacity to promote further competition (World Bank 2019b). These challenges will be further discussed in a later section on institutional quality (5.3), but preliminary evidence signals that the lack of competition in the digital infrastructure market could be a constraint in Ethiopia limiting the provision of digital services. To determine whether digital infrastructure and its associated market structure are binding constraints on financial inclusion, we analyze the usage and prices of digital services.

Both mobile and Internet subscribers have increased in Ethiopia, but their numbers are still very low (Table 2). Mobile phone penetration has remained low compared with peer countries in Africa, posing a significant barrier to the usage of DPS such as mobile money.

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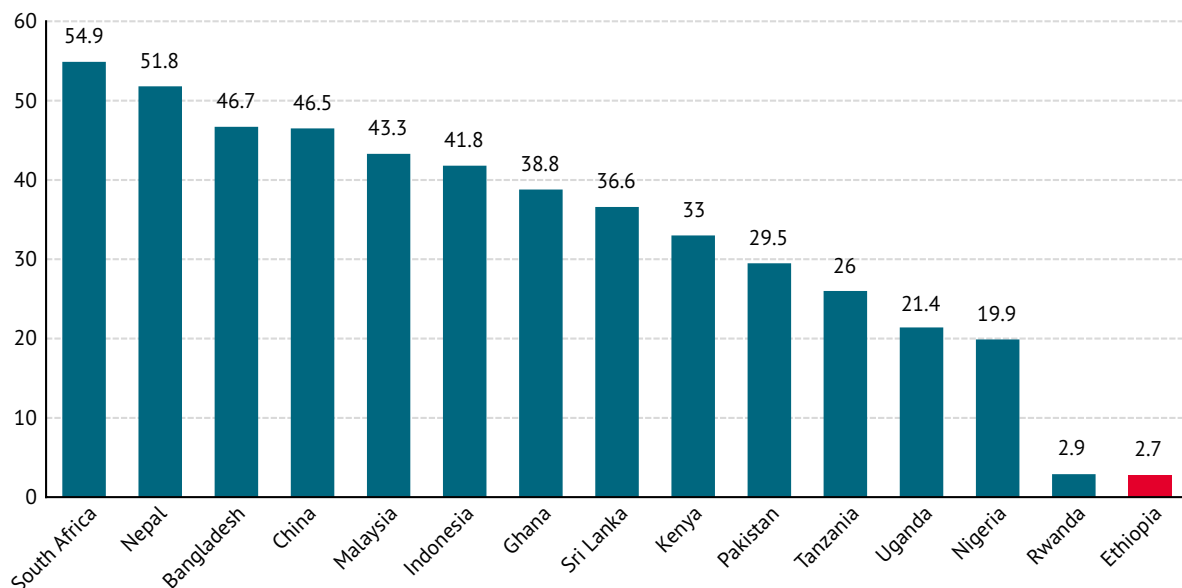
<sup>35</sup> After this paper was written, there were important changes to the digital infrastructure market. In May 2021, following a competitive bidding process, Ethiopia awarded, for the first time, a telecom license to a consortium of foreign companies led by Kenya's Safaricom. The Council of Ministers authorized the Ethiopian Communications Authority to grant the telecom license to the Global Partnership for Ethiopia, "which offered the highest licensing fee and a solid investment case," with over US\$8 billion of total investment over 10 years. This consortium will start operating in 2022 and provide 4G and 5G internet services. Moreover, the Ethiopian government also plans to sell 45 percent of Ethio Telecom, with the government retaining a majority share (Afrique 2021). The awarding of new licenses and the changes to Ethio Telecom will likely end the Ethiopian government's monopoly over the telecoms sector.

However, Ethio Telecom will continue to be the only telecom able to offer mobile financial services, as foreign operators remain barred by law from participating in financial services. And while this increased competition may reduce prices, affordable digital infrastructure is a necessary but not sufficient condition to improve financial inclusion. As we discuss in section 5.3, institutional deficiencies can continue to harm competition.

This paper's conclusions are not substantially altered by these developments, especially in the short and medium term. The impacts of these changes in the digital infrastructure sector on actual competition levels and the price structure discussed in this section remain to be seen.

Given the low income level in Ethiopia, people mainly use basic cell phones because smartphones are too expensive, at least for the majority of the population.<sup>36</sup> The *Economist* Intelligence Unit's Inclusive Internet Index provides a useful indicator for the affordability of smartphones (*Economist* Intelligence Unit 2020);<sup>37</sup> the score ranges from 0 (the least affordable, relative to income) to 100 (the most affordable). With a score of 2.7, smartphones were least affordable in Ethiopia in 2020, out of a sample including Bangladesh (46.7), Kenya (33.0), Ghana (38.8), Nigeria (19.9), Tanzania (26.0), and Uganda (21.4) (Figure 8). In 2015, a survey by the Pew Research Center indicated that only 4 percent and 44 percent of adults in Ethiopia reported owning smartphones and basic phones, respectively (Pew Research Center 2021). More recent data show that by January 2021, there were about 44 million mobile connections in Ethiopia (Kemp 2021). This is equivalent to about 38.5 percent of the population, a number that is most likely overestimated because many people have more than one mobile connection.

**Figure 8. Index of affordability of smartphones (handsets), 2020**



Source: *Economist* Intelligence Unit (2020).

While feature phones are relatively cheaper, access to digital infrastructure is still limited as feature phones are not affordable for a substantial part of the population. Consultations with Ethio Telecom indicate that, by March 2021, the average cost of a basic phone was around ETB 600 (about US\$15),<sup>38</sup> compared with US\$100 for a smartphone. The average cost of a basic mobile phone was about 2 percent of yearly GNI per capita, and the service to enable its use was US\$1.40 per month in 2019, or 2 percent of monthly GNI per capita. In a

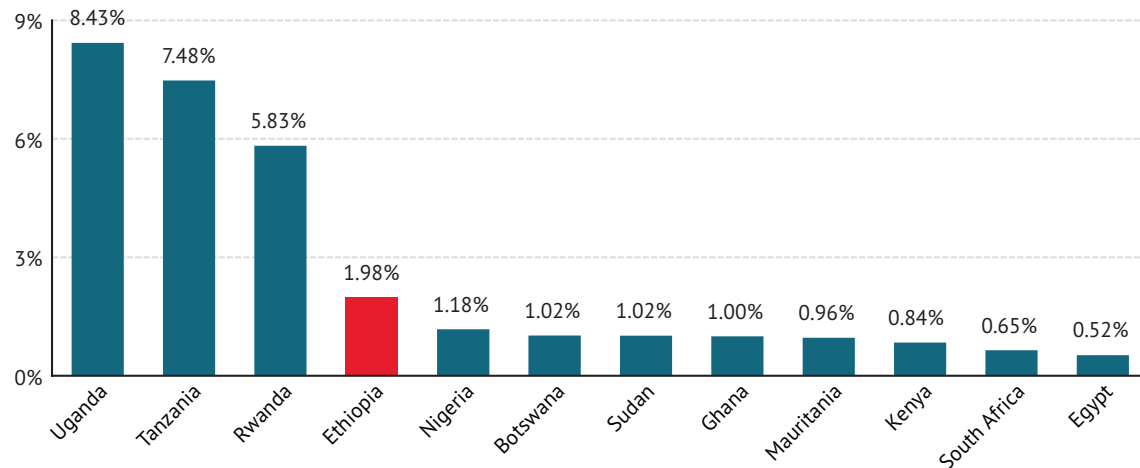
<sup>36</sup> Recent information is not available to differentiate the share of people using basic mobile phones versus those using smartphones.

<sup>37</sup> There is no score for basic mobile phones.

<sup>38</sup> Exchange rate: US\$1 = ETB 40 in March 2021.

country comparison of the cheapest prepaid mobile voice products among African countries, Ethiopia does not rank well. When adjusted for monthly GNI per capita, mobile voice cost is more expensive in Ethiopia than in a majority of comparator countries (Figure 9) (Research ICT Africa 2020).

**Figure 9. Mobile voice and messaging cost (as percentage of monthly GNI per capita), Ethiopia and selected comparators, 2021**

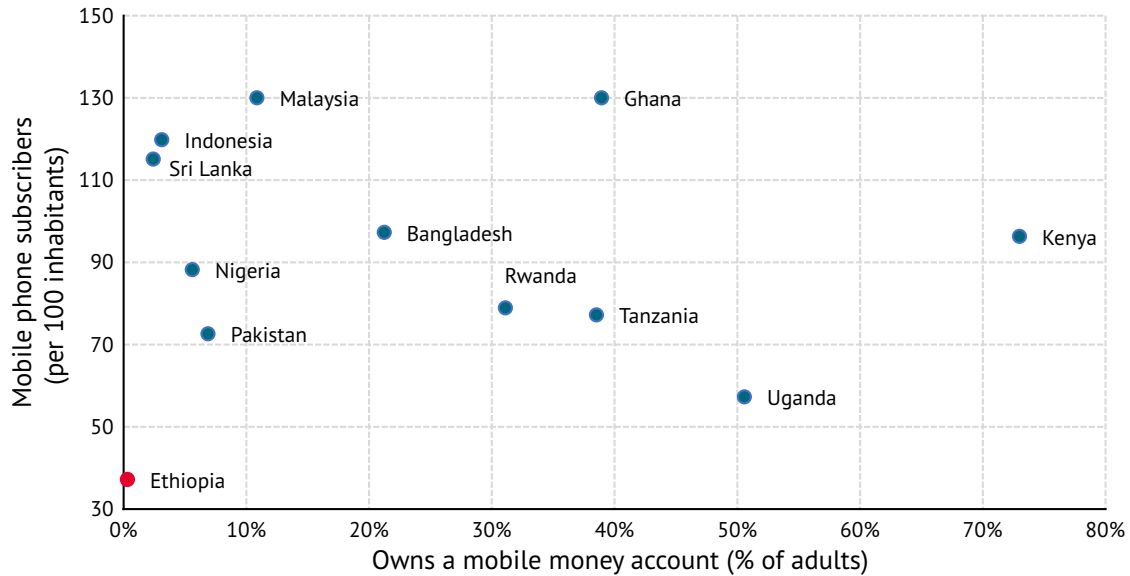


*Source:* Research ICT Africa (2021) for mobile voice and messaging cost; World Bank for GNI per capita.

The total consumer cost of mobile infrastructure in Ethiopia (including the costs of both a feature mobile phone, service, and tariffs) is very high, especially for the poor, who account for 23.5 percent of the population (based on the national poverty line of ETB 7,184, or US\$339, per year) in 2015/16 (Planning and Development Commission 2019). This is particularly notorious in rural areas, where the poor make up 25.6 percent of the total population, as compared with urban areas, where the poverty rate is lower (at 14.8 percent in 2015/16). It is precisely in rural areas where an expansion of affordable digital infrastructure could have a large impact in promoting financial inclusion, given the scarcity of traditional infrastructure in these areas.

In a number of peer countries (e.g., Kenya, Rwanda, and Tanzania), an increased number of mobile subscribers has been associated with a larger usage of mobile money accounts (Figure 10). In contrast, both mobile subscribers and mobile money accounts remain extremely low in Ethiopia.

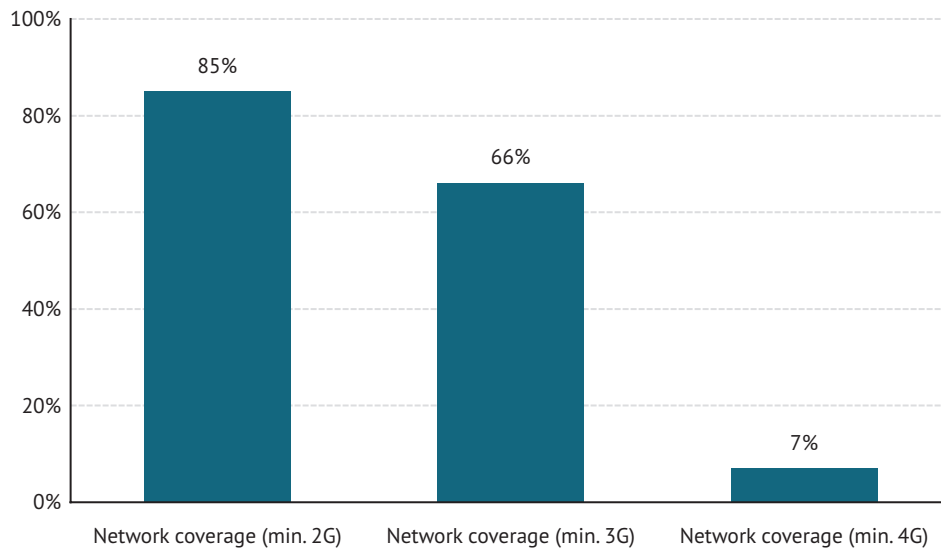
**Figure 10. Mobile penetration and mobile money accounts, Ethiopia and comparators, various years**



*Source:* Ethio Telecom for Ethiopia; in other countries, World Bank (2018a) for mobile money accounts and *Economist* Intelligence Unit (2020) for mobile subscribers.

Ethio Telecom has expanded its mobile cellular network coverage, with 85 percent of the population being within range of a 2G mobile-cellular signal, but only 7 percent of the population has access to a 4G mobile cellular network (Figure 11). Since 4G is not needed for mobile money and the 2G network coverage is quite high, cellular network coverage does not seem to be a problem in Ethiopia. Yet, similar to the mobile tariffs, the price of accessing the Internet seems to be a concern that could hinder the use of additional DPS.

**Figure 11. Access to Internet network (percentage of population), Ethiopia, 2020**

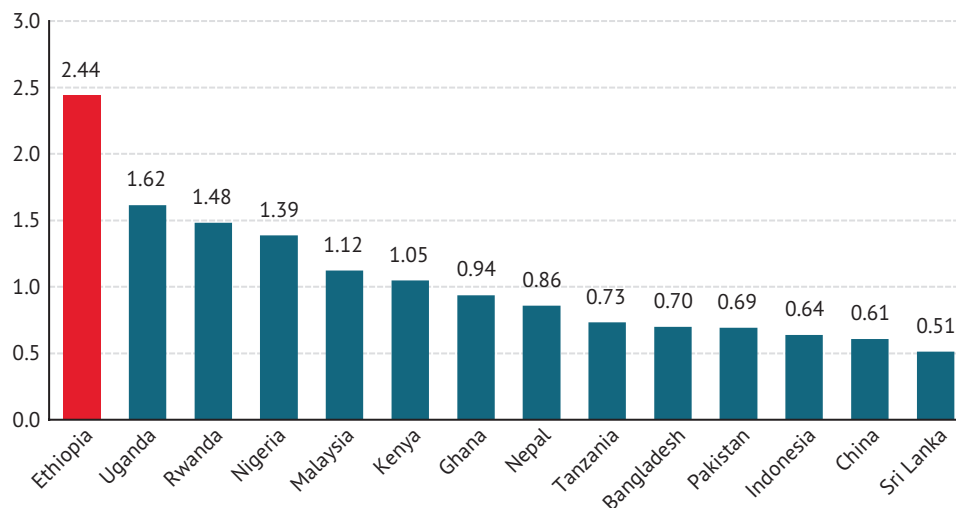


*Source:* *Economist* Intelligence Unit (2020).

Although the prices of Internet and mobile services have declined, they remain quite high in Ethiopia. Figure 12 compares the average price of 1 GB of data across selected countries and shows that the price of 1 GB is very high in Ethiopia relative to comparator countries.

The Alliance for Affordable Internet (A4AI) states that the Internet can be considered affordable when 1 GB of mobile broadband data is priced at 2 percent or less of average monthly income per capita (A4AI 2020a). In Ethiopia, accessing the Internet remains very expensive—it costs 5 percent or more of monthly GNI per capita (Figure 13). Countries with the least affordable data are also those with the fewest people connected to the Internet, indicating that the high cost of data might be the largest factor keeping people offline. The high cost of Internet in Ethiopia could be related to the absence of competition in the telecom sector, as there are no alternative Internet service providers in the country.

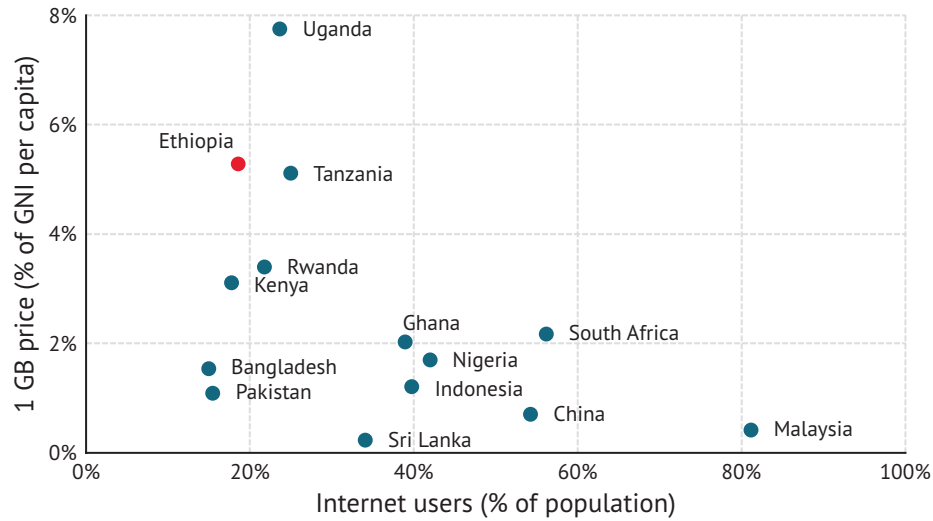
**Figure 12. Average cost of 1 GB of mobile data (US\$), Ethiopia and selected comparators, 2020**



Source: Cable (2020) and *Economist* Intelligence Unit (2020).



**Figure 13. Cost of 1 GB as percentage of GNI per capita, Ethiopia and selected comparators, 2020**



Source: A4AI (2020b) for cost of Internet; *Economist* Intelligence Unit (2020) for number of Internet users.

Ethiopia's tariffs are substantially higher than those of other selected countries, except Uganda, where 1 GB of cellular data costs 8 percent of monthly GNI.<sup>39</sup> Similarly, the postpaid mobile phone tariff and fixed-line broadband Internet monthly cost in Ethiopia are also higher than in other countries. These high Internet costs are consistent with the current monopoly nature of the Ethiopian telecom market.

The evidence presented in this section suggests that the cost of digital infrastructure is very high for a majority of the Ethiopian population. Moreover, there are additional limitations on the expansion of digital services. For instance, power outages are frequent, and there is a big divide in electricity access between rural and urban areas—only 32 percent of the rural population has access to electricity, compared with more than 95 percent in urban areas (*Economist* Intelligence Unit 2020).

Up to now, Ethio Telecom's monopolistic position has resulted in high costs and low provision of digital infrastructure, both severe constraints on the expansion of digital financial payments and transfers. As will be discussed in Section 5.3 in relation to institutional quality, this constraint might be hard to relax as long as the government (a) relies on revenue generated by Ethio Telecom as an important source of fiscal budget finance and has a political interest in controlling telecommunications, and (b) lacks the capacity to adequately regulate and supervise the operations of the private sector in the telecom industry.

<sup>39</sup> Scaling by monthly GNI per capita facilitates meaningful comparisons across countries.

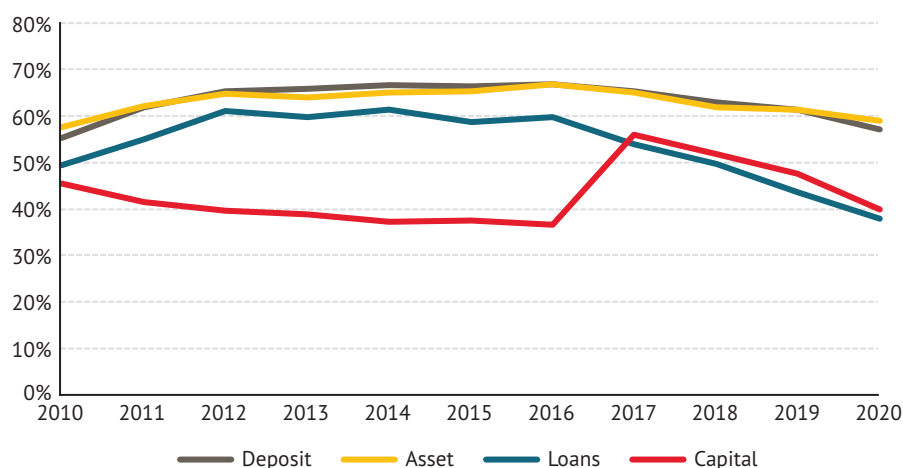
## 5.2. Constraints imposed by the characteristics of the market structure for DPS

This section assesses constraints affecting the market structure of alternative providers of DPS. Specifically, it discusses the nature of competition between providers and the regulatory framework that is creating an unlevel playing field between alternative suppliers. In addition, it analyzes issues of interoperability between digital payment platforms.<sup>40</sup>

### 5.2.1. Limited competition

As mentioned in Section 2, banks and microfinance institutions are the sole providers of DPS in Ethiopia. The CBE, the giant public bank with 78 years of banking experience, enjoyed an average market share of 63.2 percent in deposits and 63.0 percent in assets between 2010 and 2020. In 2019, CBE held about 57.1 percent and 59.0 percent of total deposits and assets, respectively (Figure 14). Although CBE's shares in capital and loans show a declining trend, they have remained very high, and moreover, CBE has a large customer base. In June 2020, the country's banking industry had about 49.7 million deposit accounts, of which more than 50 percent belonged to CBE.<sup>41</sup> As of December 2020, CBE had around 27.5 million customers.<sup>42</sup>

**Figure 14. Share of CBE in capital, deposits, and loans (percentage), 2010–2020**



Source: NBE annual reports (various years).

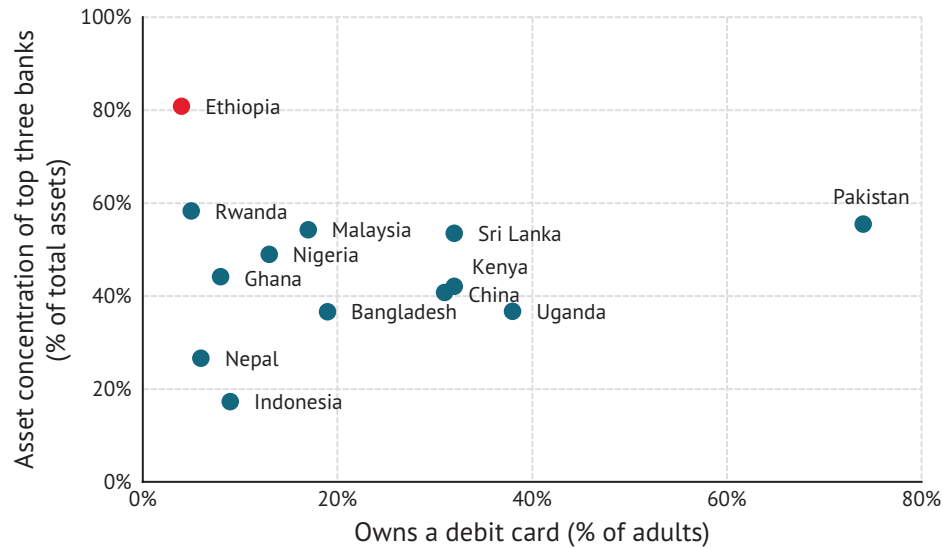
<sup>40</sup> Usually, in countries where the bulk of DPS are offered by the private sector, issues of interoperability are discussed in relation to the competitive structure of the DPS providers. Given the large participation of the public sector in the Ethiopian financial markets, however, the status of interoperability depends to a significant extent on the government's rules and regulations. Interoperability, therefore, is discussed here as a separate subsection, rather than as part of the discussion on competition.

<sup>41</sup> Data in this section come from reports of commercial banks.

<sup>42</sup> Interview with Mr. Muluken, manager of economic research, Business and Economic Research Department, CBE.

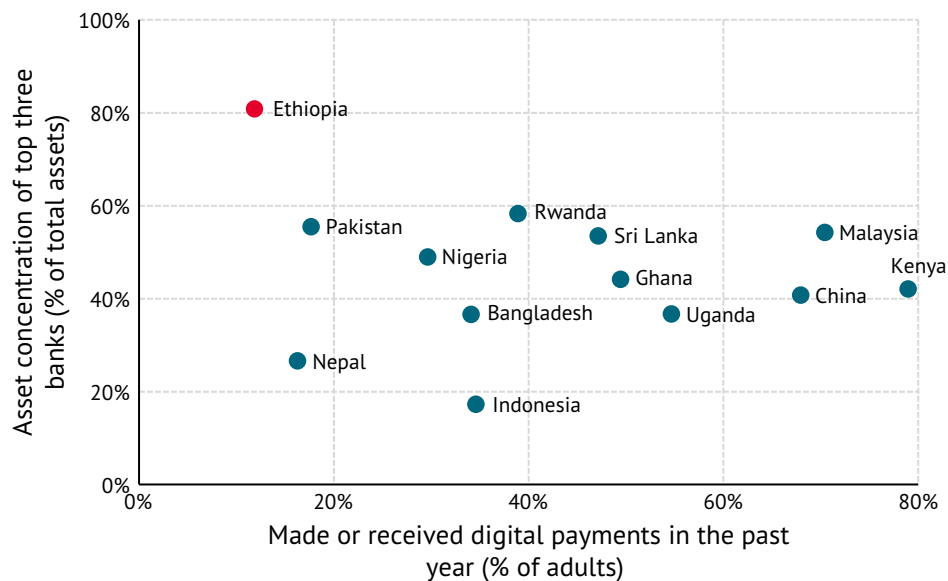
Data from the International Monetary Fund (IMF) show that the asset concentration for the three largest banks was 81 percent in Ethiopia (mainly driven by the CBE), the highest ratio by far among comparator countries. Figures 15 and 16 relate bank concentration to debit card ownership and usage of DPS, respectively. Not surprisingly, Ethiopia displays the combination of highest bank concentration and lowest percentage of adult population with debit cards and usage of DPS. Lack of competition is a severe constraint on the provision of DPS in Ethiopia.

**Figure 15. Bank concentration and debit card ownership, Ethiopia and selected comparators, 2017**



Source: IMF (2019); World Bank (2018a).

**Figure 16. Bank concentration and usage of digital payment services, Ethiopia and selected comparators, 2017**



Source: IMF (2019); World Bank (2018a).

### 5.2.2. Unlevel playing field issues

To what extent is the problem of competition associated with government rules, regulations, and interventions that distort the level playing field? The discussion in this subsection shows that these measures, to a large extent, prevent the entrance of new players in the DPS market and/or deter the activities of a group of existing suppliers, while supporting other providers.

#### *(i) An unlevel playing field in the banking system*

Although the share of private commercial banks in the Ethiopian banking industry has increased, CBE will continue to dominate for the foreseeable future, due to its large customer base and support from the government. In 2017, the government approved a proclamation to raise CBE's capital. Accordingly, CBE received a capital injection of ETB 26.5 billion (US\$1.02 billion) from the government, which raised its total capital to ETB 40 billion (US\$1.53 billion) (see the spike in Figure 14) (Berhane 2017). This support is expected to reinforce the dominant position of CBE (Cephus Growth Capital 2019). At the same time, private commercial banks are expected to comply with NBE's minimum initial capital requirement of ETB 5 billion (US\$ 120 million) for commercial banks (both CBE and private).<sup>43</sup> Given the small size of private commercial banks in terms of capital (a total of just US\$1.24 billion in 2019) (Anyanzwa 2019), this measure could deter their capacity to undertake additional investments in DPS and create barriers to market entry.

In addition, as discussed in Section 2, the financial sector is closed to foreign banks. A 2012 NBE directive (Directive No. FIS /01/2012) restricted investments in the banking sector and microfinance institutions (MFIs) to Ethiopian nationals and requires NBE to grant licenses for all mobile and agent banking products (NBE 2012). These restrictions help the CBE maintain its dominant position and undermine competition in the banking industry. As will be discussed in Section 5.3, one of the reasons for not allowing foreign banks has been attributed to NBE's weak supervisory and regulatory capacity, and the infant status of local commercial banks (Chauffour and Gobeze 2019; Bezabeh and Desta 2014).

Finally, the CBE is also privileged by the government by being the sole provider of certain services. For example, unlike private commercial banks, the CBE is entitled to manage utility payment services, salaries of government employees, and housing saving schemes. These services help the CBE further expand its customer base and increase its deposits.

Numerous banking regulations generate an unlevel playing field that clearly favors the public bank to the detriment of private banks (both domestic and foreign). These regulations perpetuate the lack of competition in the sector and potentially discourage further competition, impacting the provision of DPS. Lack of competition in the banking industry

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<sup>43</sup> In 2015, the NBE required all commercial banks to increase their minimum paid-up capital to ETB 2 billion by 2020. In May 2021, the NBE revised this and issued the Directive No. SBB/78/2021, which made the required minimum paid-up capital ETB 5 billion. The objective of increasing the minimum paid-up capital had to do with safety, soundness of the banks, and capability of insuring depositors' money.

seems to be a severe constraint associated with rules and regulations that create an unlevel playing field, and the root causes of these problems lie in institutional deficiencies.

*(ii) Telecoms as providers of DPS: Further unlevel playing field issues*

The lack of competition in digital infrastructure provision has been extensively discussed. This subsection centers around how unlevel playing field issues impact the provision of DPS by nontraditional (telecom) providers. First, an unlevel playing field between banks and telecoms has existed in the past in Ethiopia. And second, within the telecom market, foreign companies remain excluded and Ethio Telecom maintains relevant benefits that reinforce its dominant position beyond the provision of digital infrastructure in the DPS market.

In 2012, the directive that opened up the door for mobile money and agent banking in the country (NBE 2012) allowed only financial institutions to engage in mobile banking services. The directive prohibited nonfinancial institutions (e.g., Ethio Telecom) from engaging in DPS. This prevented the development of fair competition between banks and telecoms in the provision of DPS, with the resultant adverse impact on the development of DPS.

In recognition of this situation, more recently the government issued a directive that relaxed this constraint. The NBE now allows nonfinancial institutions, including MFIs and mobile network operators (MNOs) or telecoms,<sup>44</sup> to engage in DFS (NBE 2020a, 2020b).<sup>45</sup> The new regulation has the potential to induce competition in the provision of DFS in Ethiopia as nonbank operators are allowed to join the market.<sup>46,47</sup>

It should be noted, however, that although the current directive is one step forward in leveling the playing field between banks and telecoms, competition issues within the telecom market persist. Ethio Telecom will be the dominant MNO player in the provision of DFS as it owns key infrastructure and has a large customer base (with 48.9 million mobile voice subscribers).<sup>48</sup> Furthermore, the government decided to increase its capital to ETB 400 billion (US\$10 billion) (Ethio Telecom 2021). Thus, Ethio Telecom will have “privileged”

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<sup>44</sup> Two MNOs have already applied for licenses, and their applications are being processed by the NBE. Note that the terms *MNOs* and *telecoms* are used interchangeably throughout the paper.

<sup>45</sup> In early 2021, Ethio Telecom had already completed administrative and human resources arrangements to kick off its mobile money services. It was waiting for its license from the NBE (interview with Ethio-Telecom official). In mid-May 2021, the service was officially launched.

<sup>46</sup> Through enhanced competition and innovation, new market entries could improve the quality and penetration of digital financial services, as well as of mobile phone and mobile and fixed broadband services (World Bank 2019b).

<sup>47</sup> There is evidence that leveling the playing field improves DPS. In countries such as Kenya and Tanzania, involvement of MNOs in the provision of mobile money services improved competition and lowered prices (Ericsson 2016). In 2007, Safaricom of Kenya launched M-Pesa, a mobile money service that helped increase digital financial inclusion, reaching more than 80 percent of the population in 2019. To illustrate its reach, there were 58.3 million mobile wallets in 2019, representing 1.7 mobile wallets for every adult (Pazarbasioglu et al. 2020).

<sup>48</sup> As indicated in its strategic plan, the company expects to generate US\$13 billion from directly engaging in mobile money services by 2025.

access to the market since banks use Ethio Telecom's infrastructure. In addition, given the limited regulatory capacity of both ECA and NBE, it is very unlikely that the playing field will be fully leveled any time soon.

Although foreign companies have been recently allowed to join the telecommunications sector, they are not allowed to offer DFS. This means Ethio Telecom will be the dominant player, especially in provision of mobile money services. In addition, the requirement that firms use Ethio Telecom's infrastructure could stifle competition in the domestic market (Dione 2021). As the dominant company, Ethio Telecom has considerable power to set prices in the market and to control competition by providing or restricting access.

To recap, although there have been improvements to promote competition and ease unlevel playing field problems between providers of DPS, the dominant players (i.e., CBE and Ethio Telecom) continue to enjoy advantages in the provision of DPS, and the playing field is far from level.

As noted in the infrastructure section (5.1), the monopolistic nature of Ethio Telecom hinders the expansion of DFS, given the high prices charged by the company for digital infrastructure. Moreover, these competition problems are likely to be present in the provision of DPS once telecom providers start offering mobile money services. The unlevel playing field issues in DPS provision, similar to the lack of competition in digital infrastructure, find their root causes in institutional capacity problems and the government's economic and political interests (see Section 5.3).

### **5.2.3. Interoperability**

Interoperability is a crucial component of the DFS market structure.<sup>49</sup> Interoperability allows two or more payment platforms to interact seamlessly, enabling users to conduct digital payment transactions with any other user in a convenient, affordable, and secure way (ITU-T Focus Group Digital Financial Services 2016). For instance, being able to use a debit card in different ATM networks implies that the ATM system in the country is interoperable. As discussed by Bourreau and Valletti (2015), there are different levels of interoperability.

In Ethiopia, interoperability is at a very nascent stage. Cepheus Growth Capital (2020) noted that although basic infrastructure to offer digital banking services has been put in place in many commercial banks in the country, the actual usage of DFS remains limited due to inadequate connectivity and lack of interoperability. With a fully interoperable digital payment system, individuals and businesses would be able to transact business using multiple channels such as Internet, mobile, and cards, and make and receive payments from any bank account in the country.

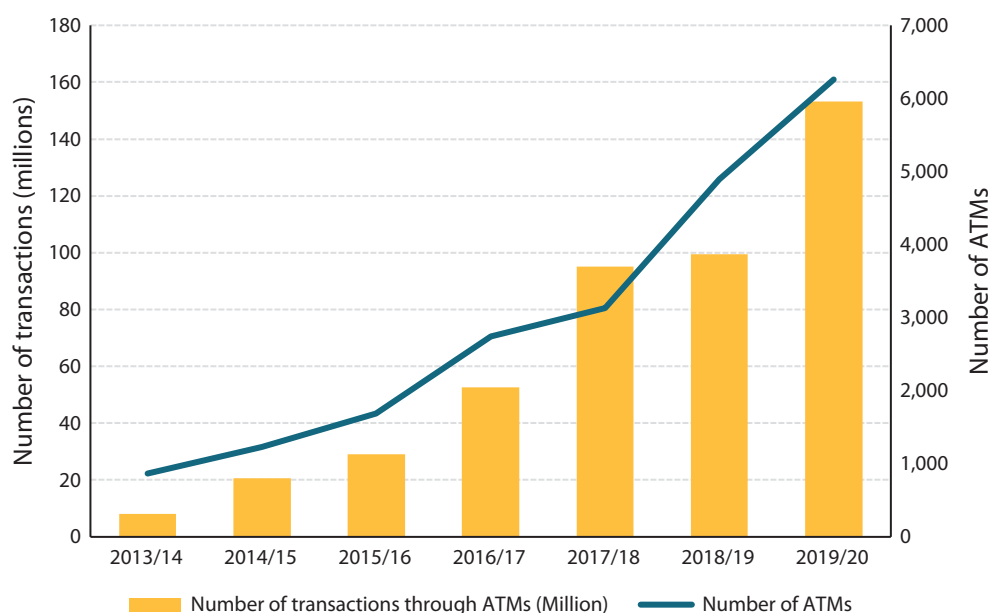
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<sup>49</sup> For further discussion on interoperability see Ndung'u (2019).

EthSwitch is in charge of implementing interoperability at the system/platform, agent, and customer levels by bringing together different stakeholder providers.<sup>50</sup> Discussions with the NBE indicated that EthSwitch was supposed to launch full-scale interoperability by the end of September 2020. However, operationalizing interoperability has been delayed until later in 2021 due to the limited capacity of EthSwitch.<sup>51</sup> Beginning in April 2020, commercial banks have used NBE's real-time gross settlement (RTGS) facility for interbank money transfers, but RTGS does not work online; instead, clients have to visit a bank branch.

Interoperability of ATMs has been in place since 2016, but only for withdrawals, as interbank transfers are not allowed, indicating the absence of interoperability at the platform level. Following the launching of interoperability for withdrawal transactions, the number of transactions through ATMs increased significantly (Figure 17).

**Figure 17. Number of transactions through ATMs, Ethiopia, 2013/14–2019/20**



*Source:* NBE annual reports (various years).

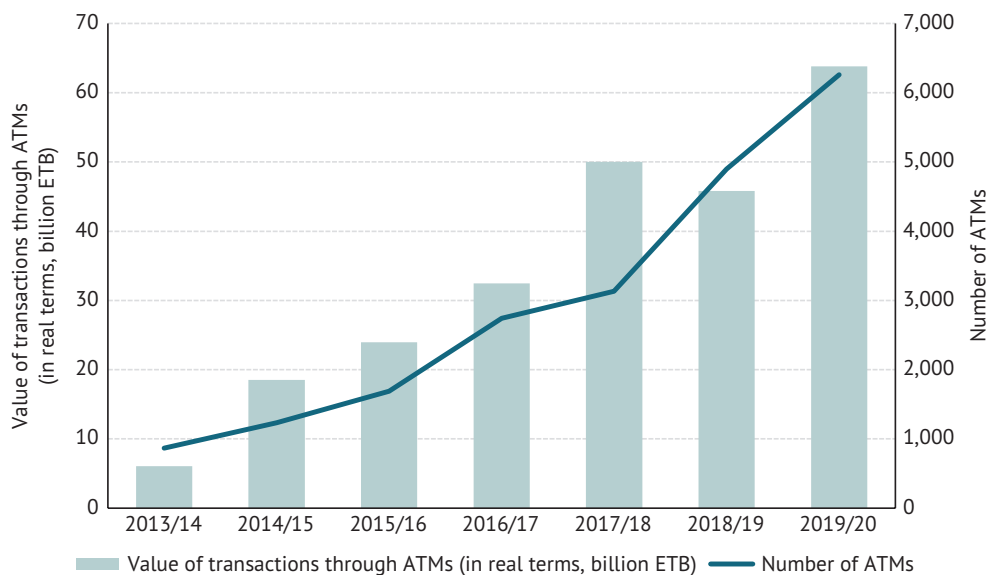
Between 2016/17 and 2019/20, the number of transactions grew by about 30.7 percent per year, suggesting that ATMs' interoperability, albeit partial, could have contributed to the surge in transactions. Figure 18 presents the value of these transactions (in real terms), also showing an increasing trend. Applying principle 2 from the decision tree methodology, it can be seen that a relaxation of a constraint may have had an effect in increasing usage. However, since transactions remain very low and this was an increase from a very low base, it does

<sup>50</sup> Initially, CBE did not cooperate due to fear of losing its market dominance and competitive advantage. Given that it is a government-owned bank, and that the government was interested in advancing the interoperability agenda, CBE joined the platform (EthSwitch 2017).

<sup>51</sup> Making PoS interoperable took more time than initially planned and delayed the project by more than four months. There is now no specific time frame as to when EthSwitch will launch the shared infrastructure.

not seem that the absence of interoperability for withdrawal purposes was, before 2016, a binding constraint.

**Figure 18. Real value of transactions and number of ATMs, Ethiopia, 2013/14–2019/20**



Source: NBE annual reports (various years).

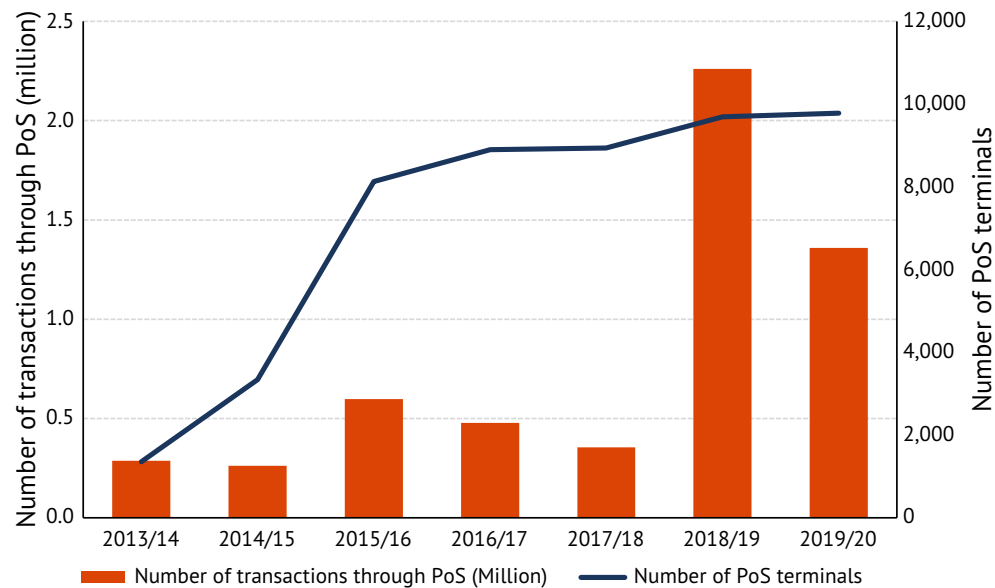
In Ethiopia, achieving interoperability can be considered a necessary but not a sufficient condition for improving financial inclusion, as other constraints need to be solved first. For example, based on the discussion above, resolving the issues of an unlevel playing field and the resulting inadequate competition between the public bank and the private banks seems more important.

In September 2020, EthSwitch made PoS operations interoperable as well. Using the interconnection protocol facilitated by EthSwitch, PoS interoperability enables terminals to authenticate, authorize, and clear payments from banks. It also allows cardholders to make payments at any location using the PoS terminal of any bank.<sup>52</sup> It should be noted that the number of transactions through PoS has remained small, especially between 2013/14 and 2017/18, with a small increase in 2018/19 and 2019/20 (Figure 19). Real value of transactions also increased in 2018/19 and 2019/20 (Figure 20). Given the recent implementation of PoS interoperability, it is too early to assess its impact on the number or volume of transactions.

<sup>52</sup> PoS interoperability has been tested at Unity Park, Fresh Corner, Shoa Shopping Centre, Yod Abyssinia Cultural Restaurant, and Safe Way Supermarket in Addis Ababa (Wondewossen 2020).

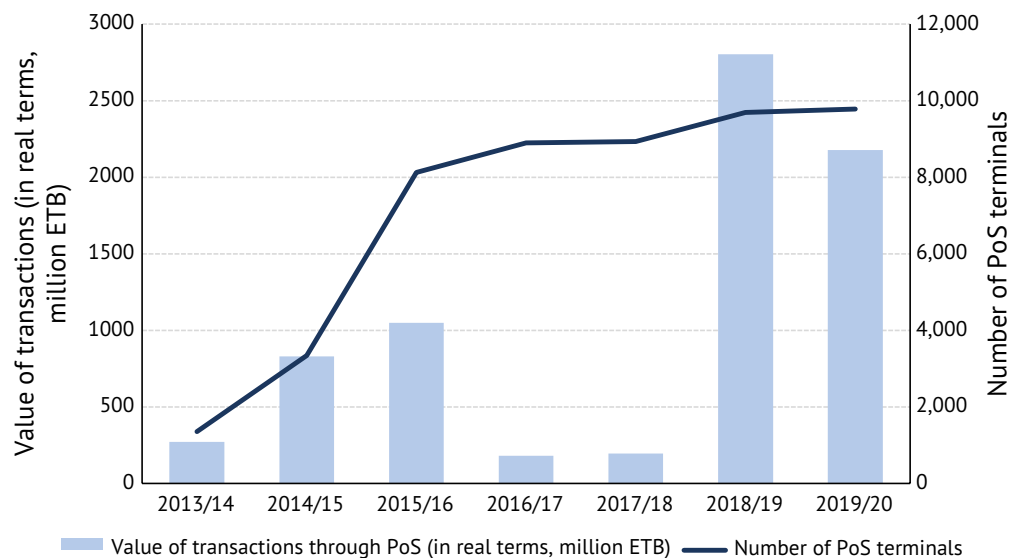


**Figure 19. Number of PoS transactions and number of PoS terminals, Ethiopia, 2013/14–2019/20**



Source: NBE annual reports (various years).

**Figure 20. Value of PoS transactions (in real terms) and number of PoS terminals, Ethiopia, 2013/14–2019/20**



Source: NBE annual reports (various years).

Note that interbank money transfers via Internet and mobile banking applications are not yet possible in Ethiopia.<sup>53</sup> Also, as of the writing of this paper, interoperability between mobile money platforms is not possible—that is, there is no interoperability between CBE-Birr and HelloCash, between HelloCash and M-Birr, and so on, as these are operated by different banks. Given this lack of interoperability at the system/platform level, there is also no interoperability at the agent level. According to the 2012 NBE directive (No. FIS /01/2012), an agent could not have an agreement with multiple banks; that is, the directive imposed agent exclusivity. In 2020, however, this constraint was eased, enabling an agent to provide services to multiple banks.

In sum, the lack of interoperability between DPS providers is still a challenge in the country as interoperability across different platforms is not yet fully operational. Limited interoperability is possible for selected DPS (e.g., withdrawal using an ATM).

Reviews of countries' experiences show the critical role of interoperability for financial inclusion, as it reduces the duplication of services, helps increase market access, and makes service delivery more efficient (Ericsson 2016). After the introduction of interoperability in Tanzania in 2014, transactions grew by about 16 percent (Pazarbasioglu et al. 2020). In 2018, Ghana made mobile money services fully interoperable, both among mobile money operators and with bank accounts, which led to a 250 percent growth in the volume of transactions between customers of different mobile money providers in 2019 (Pazarbasioglu et al. 2020).<sup>54</sup> In Kenya, allowing interoperability for mobile money services led to enhanced competition and a drop in the price of these services.<sup>55</sup> Both national data and country case studies indicate that facilitating interoperability leads to an increase in the usage of DPS (Ndung'u 2019).

Yet, although customers are expected to benefit from interoperability and expanding network access, full interoperability will not reduce the market dominance of the CBE, at least in the foreseeable future. In addition, even if interoperability is in place, provision of DPS such as mobile money may not increase significantly due to the monopoly power of Ethio Telecom, which will continue to be an impediment to the expansion and provision of digital infrastructure at affordable prices. As a dominant company, Ethio Telecom might not be interested in extending interoperability, since it may benefit more by protecting its share of the pie than by expanding the size of the pie. These severe constraints seem to dominate the lack of interoperability, which could, however, become a binding constraint in the future, after these other first-order constraints are relaxed.

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<sup>53</sup> There are, however, pilot programs of person-to-person apps, which allow interoperability from account to account, wallet to wallet, account to wallet, and wallet to account.

<sup>54</sup> In 2017, about 60 percent of Tanzanian mobile money users reported having made an interoperable person-to-person transaction in the past six months (Pazarbasioglu et al. 2020).

<sup>55</sup> Kenya has yet to achieve interoperability at the platform level (Ndung'u 2019).

### 5.3. Problems with appropriability of returns

This subsection discusses challenges related to the appropriability of returns. These include institutional quality and governance issues (and their relationships with other branches of the tree, namely, competition problems in digital infrastructure and the banking system), problems of verifying the identity of customers (KYC), and distortionary taxes and subsidies.

#### 5.3.1. Institutional deficiencies

The institutional environment is potentially the most important branch of the digital payments decision tree for Ethiopia. Institutions and governance determine the development of the financial sector in general and of DPS in particular. Moreover, in the case of Ethiopia, they especially affect two upper-level branches of the tree where we have identified the presence of severe constraints: lack of adequate digital infrastructure and problems with the market structure in which providers of DPS operate (involving both competition and unlevel playing field issues). In this way, institutional impediments seem to be the binding constraint on digital financial inclusion (i.e., the root cause of the lack of such inclusion) in Ethiopia.

The World Bank's Ease of Doing Business ranking for Ethiopia provides a broad picture of the problems in the country's regulatory environment. In 2020, Ethiopia ranked 159 among 190 countries (World Bank 2020). Concretely, establishing a business was extremely burdensome in Ethiopia, requiring 11 procedures and 32 days, placing the country at 168 out of 190 countries in the Starting a Business subindex. The 2018 Global Competitiveness Report also ranked Ethiopia 126 out of 140 countries (Schwab 2019).<sup>56</sup> Such a hostile business environment discourages investments in the country and inevitably harms competition. However, more concrete institutional problems are behind the lack of competition in key sectors in Ethiopia.

We explore how a wide range of institutional quality indicators are related to competition problems in the provision of digital financial infrastructure, as well as in the banking sector generally. While the Ethiopian government is making efforts to liberalize its economy, much remains to be done. Despite the adoption of the Trade Competition and Consumers Protection Proclamation in 2014, competition laws are not fully enforced in practice, as public companies (the CBE and Ethio Telecom) continue to dominate their corresponding markets (Bertelsmann Stiftung 2020). As Bertelsmann Stiftung (2020) noted, current regulatory frameworks, which fail to prevent monopolistic and cartelistic structures, are inadequate to encourage competition.

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<sup>56</sup> The most recent edition of the World Economic Forum's Global Competitiveness Report, for 2018, assessed 140 economies. This edition introduced a new methodology emphasizing the role of human capital, innovation, resilience, and agility, not only as drivers but also as defining features of economic success in the Fourth Industrial Revolution. As a result, the report's scale has been changed to 1 to 100 from 1 to 7, with a higher average score meaning a higher degree of competitiveness. The report is made up of 98 variables organized into 12 pillars, the most important of which are institutions, infrastructure, ICT adoption, macroeconomic stability, health, skills, product market, labor market, financial system, market size, business dynamism, and innovation capability (Schwab 2019).

The matrix in Table 4 relates institutional deficiencies and the operations of providers of digital infrastructure and financial services. The columns show two main institutional deficiencies: lack of capacity (often cited by national authorities and international partners) and unwillingness to relinquish control of important industries. The rows present the two regulators and the two key actors in the development of financial inclusion in Ethiopia—the ECA as the regulator of the telecommunications industry and Ethio Telecom as the main provider in this sector and similarly, the NBE as the financial sector regulator and the CBE as the dominant provider of financial services. The connections between the institutional deficiencies and the behavior of regulators and suppliers in these two industries are further explored in the following subsections.

**Table 4. Institutional deficiencies and the markets for digital infrastructure and financial services<sup>57</sup>**

		Institutional deficiencies	
		Lack of capacity	Unwillingness
(Sector) Regulator/ Key player	(Telecommunications) ECA/Ethio Telecom	Reflected in low implementation of liberalization reforms (despite support by World Bank)	<ul style="list-style-type: none"> <li>• Economic interest in using profits from Ethio Telecom to finance government expenditure</li> <li>• Political interest in controlling communications, especially in times of unrest</li> </ul>
	(Financial services) NBE/CBE	Lack of capacity to regulate and supervise new entrants, particularly foreign (reflected in technical assistance missions by IMF and World Bank)	Reflected in the lack of institutional independence

Source: Own elaboration.

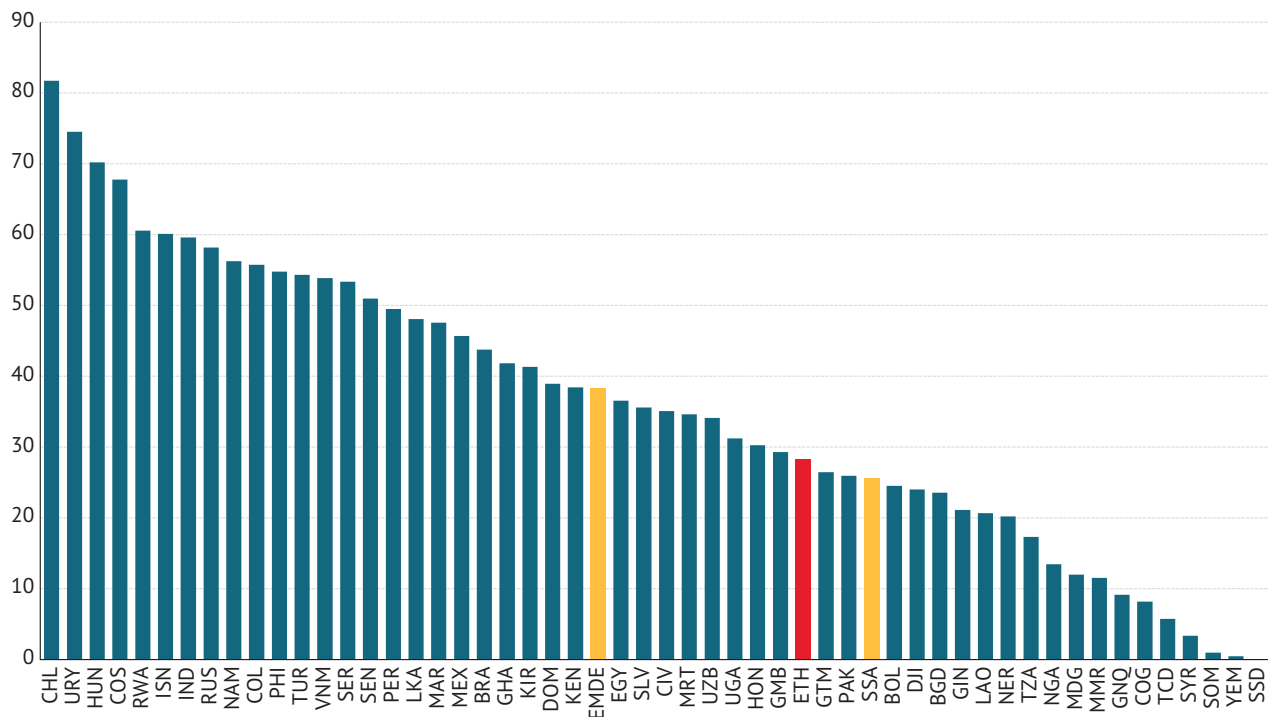
To represent the *lack of capacity* dimension of institutional deficiencies in Ethiopia, we focus on indicators of government effectiveness and regulatory quality. These two indicators, among many others that assess institutional quality, are adequate to capture the authorities' limited capacity to formulate and implement reforms that would support digital infrastructure and the provision of financial services. To depict the *unwillingness* of the public sector to promote competition, we present direct evidence and explore literature on the topic.

<sup>57</sup> While the focus of the paper is on DPS, we discuss financial services in general, as the constraints on DPS affect the provisioning of all financial services. However, the constraints we discuss are likely more severe for innovative digital products that are less established in Ethiopia.

(i) *Lack of capacity*

The World Bank Government Effectiveness Indicator can shed light on the overall quality of institutions in a country. The indicator captures “the quality of public services, the quality of the civil service and the degree of its independence from political pressures, the quality of policy formulation and implementation, and the credibility of the government’s commitment to such policies” (Kaufmann et al. 2010, 4). Thus, government effectiveness fosters a benign context for private investment. As presented in Figure 21, Ethiopia (in red) has a low score and percentile rank (at 28) in government effectiveness. Some countries (e.g., Bangladesh, Nepal, Tanzania, and Uganda) with similarly low scores have much better rates of financial account ownership than Ethiopia, suggesting that lack of government effectiveness is not a binding constraint in these countries. Moreover, Ethiopia is well below the average for emerging markets and developing economies, and barely above the sub-Saharan Africa average (both in yellow).

**Figure 21. Ethiopia’s percentile rank in government effectiveness  
(compared with selected countries), 2019**



Source: World Bank (2021b).

Note: EMDE = emerging markets and developing economies; SSA = sub-Saharan Africa.

The other key governance indicator for Ethiopia is regulatory quality, which captures “the ability of government to formulate and implement sound policies and regulations that permit and promote private sector development” (Kaufmann et al. 2010, 4), thus laying down uniform rules of economic engagement. Ethiopia’s percentile rank in regulatory quality is 16.8, considerably lower than comparator countries and even lower than the average for emerging markets and developing economies and for sub-Saharan Africa (Figure 22). These numbers are more concerning than the ones on government effectiveness because they depict the poor regulatory capacity of Ethiopian institutions in general.

**Figure 22. Regulatory quality percentile rank of Ethiopia (compared with selected countries), 2019**



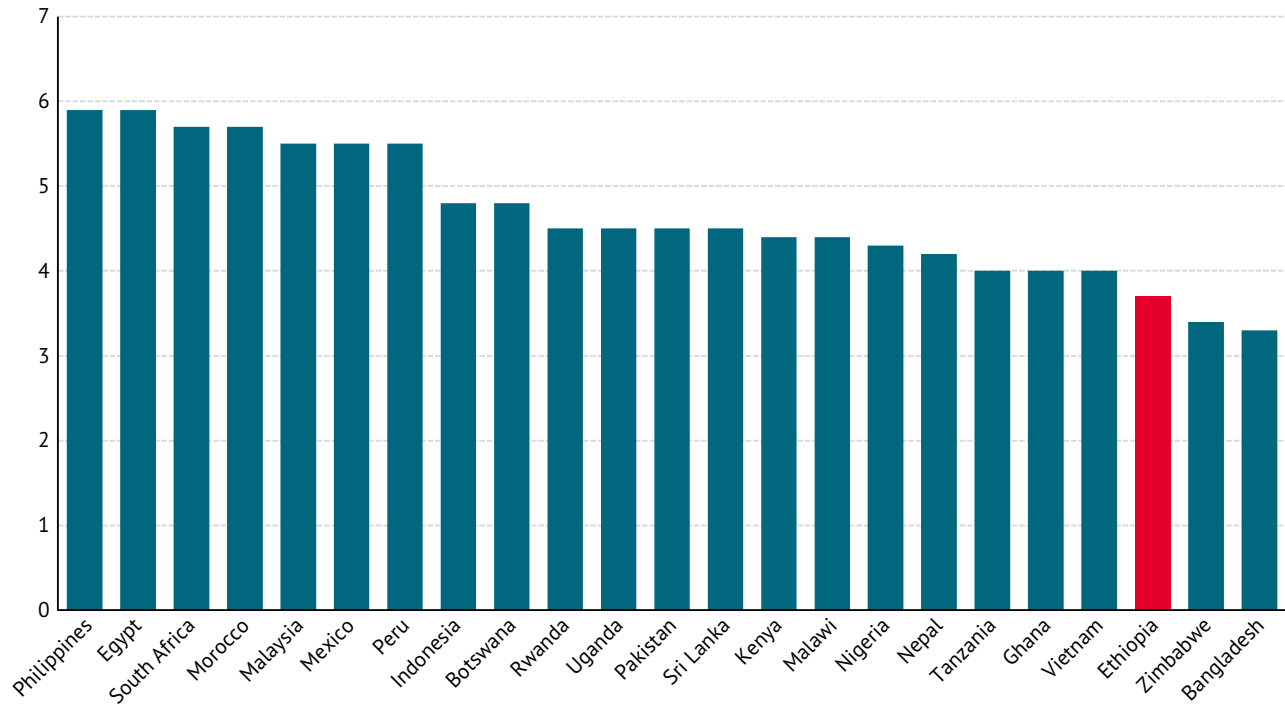
Source: World Bank (2021b).

Note: EMDE = emerging markets and developing economies; SSA = sub-Saharan Africa.

Concretely, the weak capacity of the NBE has been a drag on the development of Ethiopia’s financial sector in general and DPS in particular. Ethiopia’s score in soundness of banks is very low (Figure 23) and NBE’s lack of supervisory capacity limits data availability and quality. In June 2020, the IMF started providing technical assistance to the NBE to improve its reporting of financial soundness indicators (IMF 2020). Earlier studies indicate that the NBE has limited capacity to effectively regulate and supervise the financial sector,<sup>58</sup> undertake research, and formulate and implement monetary policy (Chauffour and Gobezie 2019; World Bank 2012).

<sup>58</sup> Unfortunately, Ethiopia is not included in the World Bank’s most recent Bank Regulation and Supervision Survey.

**Figure 23. Soundness of banks (scale 1–7), Ethiopia and selected comparators, 2019**



*Source:* Schwab (2019)—World Economic Forum.

In addition, two of the authorities’ alleged reasons for not allowing foreign companies to participate in financial services have been the NBE’s weak supervisory and regulatory capacity and the infancy of local commercial banks. This implies that foreign entry into the financial sector would be allowed if NBE’s supervisory and regulatory capacity were adequately strengthened and if domestic banks were to become more competitive (Weis 2020; Chauffour and Gobezie 2019; Bezabeh and Desta 2014).

While efforts to strengthen the capacity of the NBE are being carried out, it is not clear when the central bank will reach the necessary capacity or when the desired competitiveness of domestic banks will be attained to allow foreign companies into the financial sector. Recent assessments indicate that the NBE does not have adequate capacity to supervise foreign-owned banks because the current legal framework does not support consolidated supervision (World Bank 2019b).

NBE’s weak capacity has thus become a cause of the unlevel playing field and lack of competition in the banking industry, by directly and indirectly reinforcing the dominant position of the CBE. The implementation of reforms has been extremely slow, a fact that is mainly associated with inadequate in-house capacity of the NBE. For example, NBE’s supervision focuses on compliance because its risk-based supervisory capacity is very limited, and as the IMF mission noted, “there is no capital requirement for market risk” (IMF 2020). The NBE is constrained in terms of staffing, suffers a high workforce turnover (related to the lack of competitive salaries), and current staff lack proper training and experience in bank supervision and regulatory frameworks (World Bank 2019b).

Moreover, the NBE lacks independence, as it is the government that determines the objectives and targets of monetary and foreign exchange policy (Chauffour and Gobezie 2019; World Bank 2019b).<sup>59</sup> Although board members of private banks are subject to approval by the NBE, this is not the case for public banks, where the qualification criteria are not clear at all and the process is fully controlled by the government. While it can monitor and regulate private banks, the NBE lacks full enforcement power over the publicly owned CBE and cannot intervene if the CBE breaches its prudential requirements (World Bank 2019b; Merso et al. 2009). The NBE's mandate on monitoring public banks is not clear, and the government-appointed board members of the CBE and the Development Bank of Ethiopia are subject to political changes and influence.

The NBE's lack of operational independence is not in line with the Basel Core Principles for Effective Banking Supervision (BIS 2012). An additional example of the NBE's lack of independence is that it provides direct advances to the government to finance the budget on an annual basis.<sup>60</sup> It indirectly finances state-owned enterprises by granting liquidity to the CBE in the form of five-year bonds (World Bank 2019b). These issues relate to the unwillingness of the general government to give up control of key industries, which is further explained in the next subsection.

Note that capacity issues are not exclusive to the NBE and the banking industry—the ECA has limited regulatory capacity as well, which has slowed down the implementation of the privatization process and hampered competition in the telecommunications sector. In turn, this hurts the provision of digital infrastructure, as discussed in Section 5.1. For instance, the government announced that foreign telecom companies would join the market in 2020, but this has been delayed until 2021 due to the COVID-19 pandemic and regulatory complexities.<sup>61</sup> Currently, the ECA is receiving technical assistance through the World Bank's Digital Ethiopia Programme to build the in-house capacity of the ECA as well as support the privatization process by putting in place the necessary rules and regulations (World Bank 2019a).

Figure 24 depicts where Ethiopia stands in relation to two issues, namely policies and regulations related to permissions for tower zoning, and resource sharing across telecommunications operators. Ethiopia's score for infrastructure sharing is the lowest in the sample, which is not surprising given the lack of competition and the dominant position of Ethio Telecom in the country. Moreover, the metric that indicates how much the government facilitates resource sharing in the market is also the lowest in the whole sample. As indicated in Section 5.2, government regulations restrict investments by new entrants in digital

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<sup>59</sup> Given the “public good” nature of financial stability and development, ideally, both monetary policy and supervisory decisions should be detached from the political election cycle.

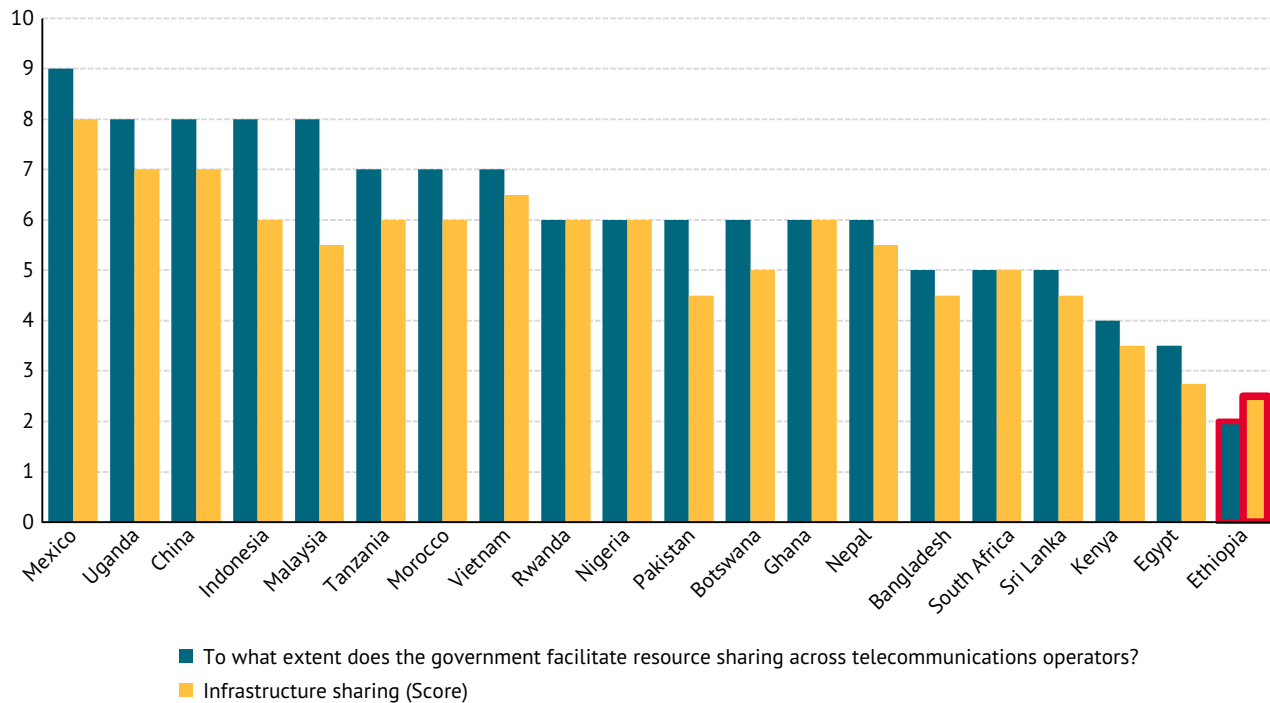
<sup>60</sup> In 2018, the NBE's outstanding claims on the government accounted for 7.6 percent of GDP, or 95.3 percent of the monetary base of reserve money. The bank also provides indirect financing to the government by extending credit to the Development Bank of Ethiopia (Chauffour and Gobezie 2019).

<sup>61</sup> Although the government set a new deadline of February 2021 to complete the partial privatization of the country's telecommunications industry, the process remains incomplete as of this writing. See further discussion in footnote 35.



infrastructure by requiring them to use Ethio Telecom’s digital infrastructure, which could hinder competition and network rollout in the country (Dione 2021).

**Figure 24. Policies and regulations in the telecommunications sector, Ethiopia and selected comparators, 2020**



Source: A4AI (2020b).

Ethiopia lags behind comparator countries in terms of achieving a policy and regulatory framework that encourages competition and improves sector governance, and the country has also been slow in implementing policies to enhance this environment. Rules governing markets and investments have been unpredictable and subject to significant government interventions. Unclear policy and regulatory frameworks disincentivize cost-effective investments in future infrastructure expansion, further raising the prices of digital infrastructure. These issues could be related to both the lack of capacity described above or to the unwillingness of the government to open up this crucial sector, discussed next.

#### *(ii) Unwillingness to promote competition*

The unwillingness to promote competition is perhaps more evident in the telecommunications sector than elsewhere, but the absolute control that the general government has over the financial system is equally relevant. As Weis noted, Ethiopia’s reluctance to adopt international standards such as the Basel framework “is the result of a strong preference for political control over the financial industry”

(Weis 2020, 328).<sup>62</sup> Several factors explain the government's unwillingness to promote competition in these two sectors.

First, the government uses Ethio Telecom, often referred to as a “cash cow,” as a source of revenue for financing other infrastructure projects (Abitew 2020). With limited revenue to finance development,<sup>63</sup> the government continues to use some of the proceeds of the company to subsidize other mega infrastructure projects (e.g., railways or dams, like the Grand Ethiopian Renaissance Dam) by keeping the telecommunications sector under state ownership (Manson 2013).

Second, the government believes that universal access to telecommunications services can be achieved through a state monopoly of the sector to ensure equitable development. According to the government, it is difficult to implement a universal access scheme in the presence of a telecommunications service provider that is driven primarily by a profit maximization motive (Workneh 2014). The government wishes to ensure that every Ethiopian has access to such services, including those in small cities and rural areas, and believes that such an objective cannot be achieved through private ownership. Yet, somewhat ironically, the government uses the state monopoly to profit from this sector.

Third, political motives have also been behind the government's insistence on keeping a monopoly in the telecoms sector. According to the Oxford Internet Institute, the Ethiopian government has used its monopoly power to conduct surveillance, censorship, and content filtering, including closure of opposition political sites, critical political blogs, independent Ethiopian media, and human rights sites (OII 2009). The government often implements Internet and mobile phone shutdowns whenever there is some form of instability in the country, creating additional problems in using digital infrastructure.<sup>64</sup> Most notably, the 2020 Internet shutdown reduced connectivity to 1 percent (Anna 2020).

Finally, an absent (or inadequate) capacity of the local private sector to engage in the telecommunications and financial sector provides the government with another justification for the public monopoly (Workneh 2014). In addition, the government's unwillingness to open these markets to foreign companies is often motivated by the lack of adequate domestic regulatory capacity, in terms of both human resources and technology, which feeds back into institutional qualms about advancing competition.

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<sup>62</sup> Weis continued, “The Ethiopian government seeks to emulate the example of East Asian ‘tiger’ economies for whom financial repression represented a key tool in the pursuit of rapid industrialization. After more than 25 years in power, the ruling party's control over the regulatory apparatus, including the central bank, is complete and uncontested” (2020, 328).

<sup>63</sup> Ethiopia's tax-to-GDP ratio was about 9.2 percent in 2019/20, well below the sub-Saharan average of 18 percent (Planning and Development Commission 2020).

<sup>64</sup> Recently, phone services were shut down in Tigray National Regional State and West Wollega Zone of the Oromia National Regional State.

### *Institutional impediments: The root cause of low financial inclusion in Ethiopia?*

Overall, the above assessment indicates that low competition in the provision of digital infrastructure and DFS can be attributed to institutional deficiencies and impediments. Limited in-house capacity in both the ECA and the NBE, coupled with the unwillingness of the general government to give up its monopoly powers, constrains competition in the domestic telecom and financial markets.

The exclusion of foreign companies from the provision of DFS is also related to the weak regulatory and supervisory capacity of the ECA and NBE, which by default provide monopoly power in the telecommunications sector to Ethio Telecom and in the banking sector to the CBE. This imperfect competition will likely be expanded to new DFS providers (such as telecom companies offering mobile money), whereby these two players will continue to dominate the market. Moreover, the importance of the sources of revenue that the general government obtains from Ethio Telecom, as well as its political interest in maintaining control of the telecommunications market, make it unlikely that the general government will give up control of this sector. Similarly, in the banking sector, the CBE remains the dominant player due to the limited capacity of the NBE to regulate and supervise a more competitive sector and its lack of independence from the central government.

Until these root-cause institutional issues are resolved, it is unlikely that digital infrastructure and the banking sector will become truly competitive. As a result, the provision of digital infrastructure and DPS will remain constrained and expensive, limiting digital financial inclusion.

### **5.3.2. Problems verifying the identity of customers**

This subsection discusses whether or not lack of an ID card is a binding constraint for DFS. The Ethiopian government passed a legal framework (Proclamation No. 760/2012) for enrolling all Ethiopians over the age of 17 into a national database and issuing them a national ID card. Accordingly, at the age of 18, a *kebele*<sup>65</sup> resident is eligible to obtain a *kebele* ID card. In 2010, the NBE issued a directive to ensure that banks have sound policies, procedures, and controls in place to identify their new and existing customers (Directive No. SBB-46-2010). The directive covers issues such as customer identification and due diligence, and it also requires banks to ask for an ID card to open an account.

Citizens obtain their ID cards from the *kebeles*, not from a national administration. The *kebele* card is accepted and required for virtually all identification purposes including registering

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<sup>65</sup> Ethiopia is a federated state with 10 regions and two city administrations. Regions and cities are further subdivided into zones and then into *woredas*, which in turn are divided into *kebeles*, the lowest form of administrative unit.

a SIM card, opening a financial account, traveling internally, obtaining a passport, and registering to vote.<sup>66</sup>

The *kebele* ID is also required to obtain functional IDs and can be used to open an account with a financial institution. Access to a *kebele* ID card is not a problem for financial inclusion, as reported by Mercy Corps and others in 2017. Each *kebele* issues its own ID card for residents at a low cost, ranging from US\$0.44 to US\$0.87, to cover the cost of printing the card (World Bank 2017a). Although there is no precise information on the coverage of ID cards in the country, it is estimated that a high percentage (between 80 and 95 percent) of the adult population holds a *kebele* ID card (Kitzmüller 2020; World Bank 2017a).<sup>67</sup> As for gendered access, in 2017, a UN Capital Development Fund–sponsored survey of Ethiopia indicated that about 59 and 77 percent of women in rural and urban areas, respectively, have a *kebele* ID (UNCDF and Dalberg 2017).

In 2016, Mercy Corps partnered with the Somali Microfinance Institution to implement a project funded by the US Agency for International Development (USAID) and called Pastoralist Areas Resilience Improvement through Market Expansion (PRIME). The program delivered cash transfers to remote rural areas through the HelloCash mobile money platform (Murray 2016). To benefit from the project, participants needed to present a valid ID card. The success of this program provides additional evidence that having a valid ID is not a problem for most Ethiopians.

Moreover, in 2017, among the adult population that did not have accounts in financial institutions, only 11 percent reported lack of documentation as a barrier to having an account. In opening a mobile money account in Ethiopia, prospective clients must first obtain a SIM card from Ethio Telecom. Second, clients need to present a copy of any of the official ID cards, which could be an active *kebele* ID card, a passport, or a driver's license.<sup>68</sup> Finally, they need to complete the registration form to obtain a mobile money account. As noted above, obtaining a *kebele* ID is not problematic in the country, which suggests this is not a binding constraint for Ethiopia.

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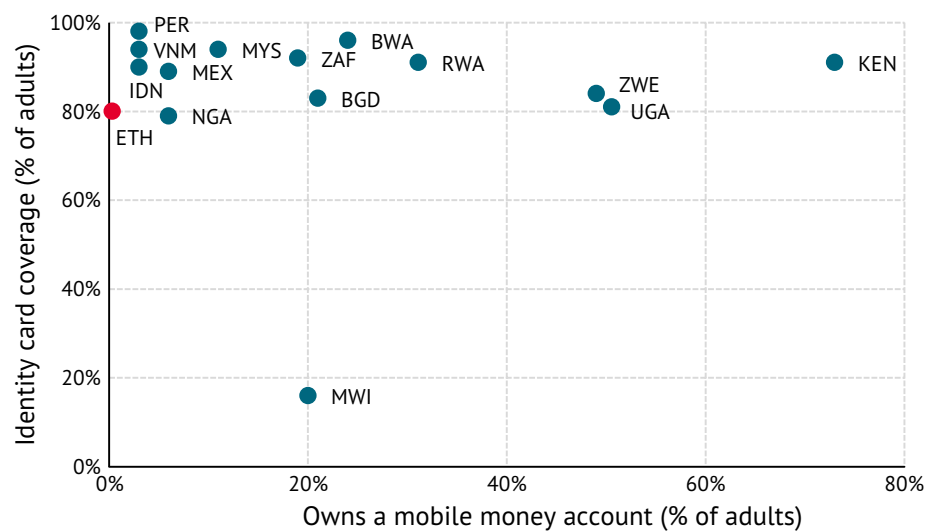
<sup>66</sup> The *kebele* ID can be considered a “foundational ID” while the others, such as driver's license, tax identification, passport, and so on, are “functional” IDs.

<sup>67</sup> In a food aid registration in *kebeles*, only about 5 percent of residents were found not to have cards (World Bank 2017a).

<sup>68</sup> There is no national identification card in Ethiopia. However, the 2017 Findex data reported that about 59 percent of the adult population have a “national” ID card (World Bank 2018a). The discrepancy is because the Findex data do not distinguish between foundational and functional ID cards. Given a low coverage of functional ID cards in the country, the Findex data can be interpreted to refer to the *kebele* ID card.

While Ethiopia suffers low ID card coverage according to Findex data (World Bank 2018a), more recent estimates show that the coverage is equivalent to that in comparator countries, with a lower bound of 80 percent (Figure 25).<sup>69</sup> In addition, Ethiopia's KYC requirement score (GSMA 2019) is comparable to that of peer countries such as Kenya, Uganda, Tanzania, and Malaysia (Figure 26). The higher the value of this score, the *less* stringent the ID requirements for KYC purposes.<sup>70</sup> As mentioned above, the sole requirement to open a bank account in Ethiopia is an active *kebele* ID card (or other valid ID). Consultations with stakeholders also indicated that banks are less stringent with ID requirements for opening accounts than in the past due to a push to expand their customer base.

**Figure 25. Identity card coverage and mobile money accounts, Ethiopia and comparator countries, 2017**

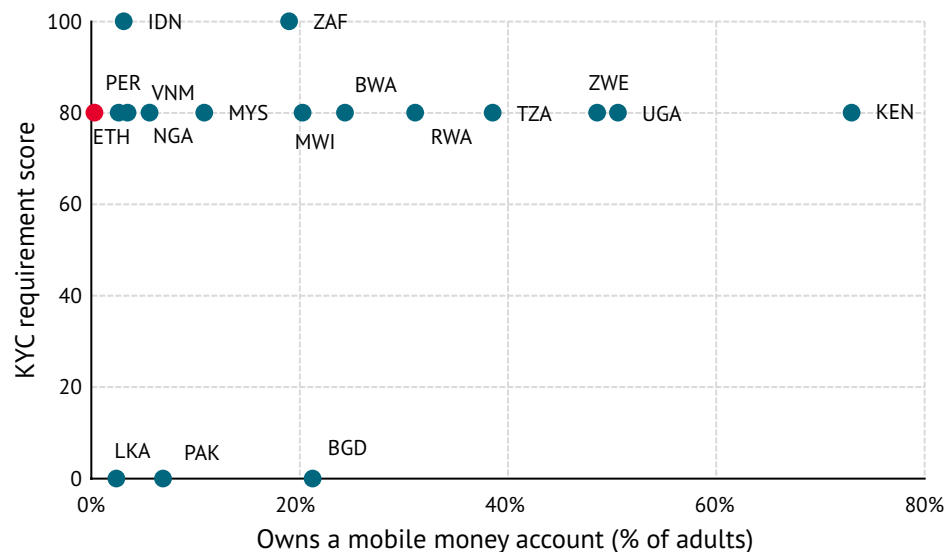


Source: World Bank (2018a) and national sources for Ethiopia, using the 80 percent estimate as a lower bound.

<sup>69</sup> A high coverage of *kebele* ID cards in recent years could also be related to increased penetration of mobile phones across the country, which require a valid *kebele* ID (or other functional ID card). Obtaining a *kebele* ID involves relatively low transaction costs, and coverage is therefore very high compared with other countries in the Findex data (World Bank 2018a). A possible explanation for the difference between Findex data and Ethiopia's national sources is that the former may be considering only national IDs and therefore not include *kebele* ID cards.

<sup>70</sup> The KYC requirement score has four dimensions with different weights: (1) requirements for verification of information extend beyond a form of identification and a mobile number (0); (2) anonymous or unregistered accounts are permitted (30); (3) ID and/or mobile number must be presented, but any additional requested information need not be verified (80); and (4) The regulation allows operators flexibility in setting the minimum KYC requirements, subject to some regulatory review or approval or according to regulations providing risk-based KYC tiers (100).

**Figure 26. KYC requirements and mobile money accounts, Ethiopia and comparator countries, 2017**



Source: World Bank (2018a); GSMA (2019) Mobile Money Regulatory Index for KYC score.

To sum up, although Ethiopia lacks a digital national identification card, there is wide coverage in the *kebele*-managed ID card system. Nevertheless, this high ID card coverage is not associated with a high level of DFS usage. We discard the theory that lack of a valid or active ID card is a binding constraint on digital finance inclusion in the country, given the substantial penetration of *kebele* ID cards and the low KYC requirements that financial institutions impose.

### 5.3.3. Taxes and other distortionary policies

The last topic relevant to the appropriability of returns is taxes. Ethiopia's tax system is progressive, with the maximum tax rate on personal income at 35 percent. Although players in the financial sector, as corporate entities, pay taxes, there are no specific taxes imposed on DPS such as mobile money. Unlike in other countries, such as Kenya and Uganda (Ndung'u 2019), there are no taxes on the use of ATMs, PoS devices, and mobile money transfers in Ethiopia. In addition, there are no transaction taxes or distortionary subsidies that promote the use of cash versus formal financial services in the country. We did not find any evidence that taxes or other potentially distortionary policies (except for unlevel playing field issues) are a binding constraint on financial inclusion.

## 6. Demand-side constraints on payment services

Demand-side factors identified in the decision tree as potential constraints on the use of digital payment and transfer services include lack of trust in financial service providers, customers' perception of low or no benefit from using the financial products, remoteness from points of access to DFS, and low income.

The 2018/19 Ethiopian Socioeconomic Survey (ESS) offers a useful starting point to analyze constraints affecting customers (CSA 2021). The survey asked the approximately 64 percent of individuals who reported no account in any financial institution to list up to three reasons for not having an account. Table 5 presents the reasons most commonly listed and will serve to guide the discussion in this section.

**Table 5. Reasons for not having an account with a financial institution (percentage of respondents), Ethiopia, 2018/19**

	Listed as first in importance	Listed as second in importance
I do not have money	43.8%	20.9%
I do not have a reason	14.8%	14.2%
Financial institutions are too far	11.2%	11.6%
I do not understand the benefit	10.5%	17.1%
Procedure is too complex	3.8%	2.8%
Someone in the family has one	3.5%	2.7%
I do not know how and where to open	3.4%	12.9%
Accounts are too expensive to use	2.5%	5.3%
Other reasons	2.3%	0.9%
Prefer informal services	1.8%	5.24%
Religious reasons	1.2%	3.4%
Lack of documents	0.46%	1.4%
I do not trust banks	0.34%	1.6%

*Source:* ESS, 2018/19 (CSA 2021).

*Note:* Red (green) indicates particularly high (low) value.

Several initial points can be drawn from these data. First, lack of money (low income) is clearly noted as the primary reason for not having an account, as almost 65 percent of respondents listed it as the first or second reason in importance, with 43.8 percent listing it as the main reason. Second distance to financial institutions and not understanding the benefit are the other two reasons that seem particularly relevant, with almost 30 percent of respondents listing the latter as one of the two main reasons and 22.8 percent listing the former. Moreover, note that lack of knowledge about how to open an account, cited by 12.9 percent as the second reason in importance, can also be linked to not understanding the benefit. Third, lack of trust is listed by very few respondents, and lack of documentation does not seem to be a constraint either, both consistent with the findings in Section 5 that

discard ID problems as a binding constraint. Finally, note 15 percent of respondents note that they do not have a reason for not having an account,

In what follows, we further explore each of the potential demand-side constraints.

### **6.1. Lack of trust in providers of financial services**

Trust<sup>71</sup> and confidence in providers are important elements in the use of DPS (Tsiakis and Stephanides 2005). Studies indicate that trust in providers and adoption of mobile money are positively correlated (Beyene 2020; Xu 2020; Gemechu Bultum 2012), suggesting that lack of trust could erode the adoption of mobile money. If users do not trust providers, they are unlikely to take up financial services and use them.

However, trust does not seem to be a constraint in Ethiopia. According to the 2018/19 ESS, only 0.34 percent of those without accounts in financial institutions reported lack of trust as the most important reason for not having an account (see Table 5). In addition, disaggregating the data by location and gender did not yield sharp differences that would point to trust as an issue for a specific subpopulation (CSA 2021).

Other studies confirm this result. Based on another demand-side survey of adults in Ethiopia, Beza and Rao (2017) indicated that merely 2 percent reported lack of trust as the only reason for not having an account in a financial institution, which is also consistent with the Findex report that 1.6 percent of unbanked respondents gave lack of trust as a reason (World Bank 2018a).<sup>72</sup>

Interestingly, whereas trust in financial institutions seems to be strong, it may be eroded by two supply-side constraints identified as either severe or binding in Section 5: infrastructure and institutional problems (affecting competition). First, power outages are frequent, hindering the ability of customers to trust that they will have continuous access to electricity and connectivity. Second, in recent years, the Ethiopian government has shut down phone services on a number of occasions in selected areas due to conflicts or political instability.<sup>73</sup> This second issue relates to the institutional deficiencies discussed in Section 5.3, namely the

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<sup>71</sup> In this context, *trust* can be defined as “an evolving relationship between the customer and a financial institution. It grows out of successful transactions during which the service provider is perceived to meet client expectations” (Cohen 2013).

<sup>72</sup> Customer insecurity can often explain low trust in providers—if financial crimes are common, users will likely mistrust DFS providers. Although there is no available information on fraud and theft experienced by customers of digital service providers, financial crime related to money laundering is not a severe problem in Ethiopia. With a score of 41 out of 100, Ethiopia is rated moderate in financial crime, placing the country in 20th position among the 54 countries of sub-Saharan Africa (Cusack et al. 2020). Its limited integration into the global financial system, underdeveloped financial institutions, and control by the government make the country less likely to experience this type of financial fraud. The study also indicated a minimal role of bank employees in the commission of fraudulent activities in the country’s banking industry.

<sup>73</sup> In early 2018, the Amhara Credit and Saving Institution was unable to disburse cash through M-Birr due to the government shutdown of the mobile network to ease political tensions (USAID and FH 2018).



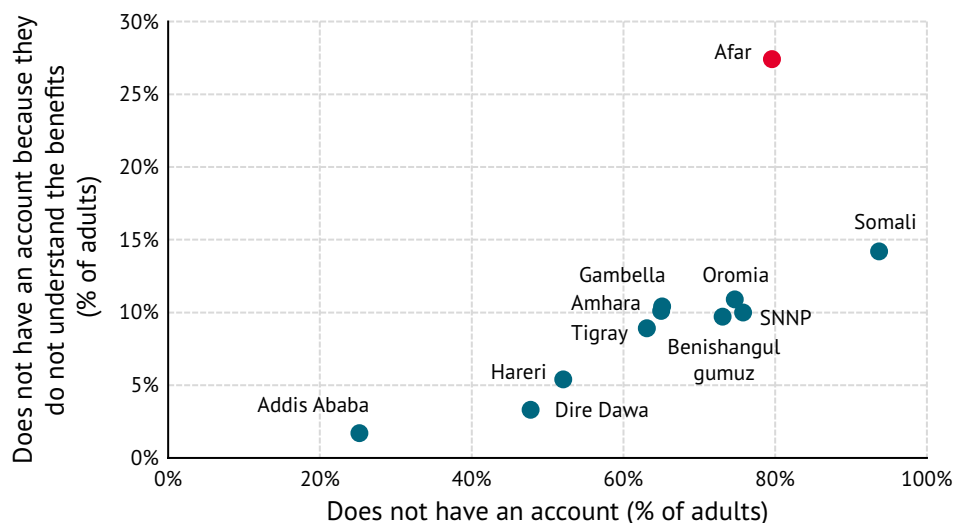
unwillingness, for political reasons, of the central government to give up public monopolies. Both of these factors could potentially hinder public trust in financial services in general.

## 6.2. Perceived low benefits

The 2018/19 ESS also captured information on individuals' perception of the benefit of having a bank account. Among financially excluded individuals, only 10.5 percent reported lack of understanding of the benefit as a reason for not having a financial institution account. Rural populations reported a perception of low benefit twice as much as urban populations (13 percent and 6.6 percent, respectively), though there were no significant differences between male and female respondents (CSA 2021).

The ESS also indicated significant disparities across regions. In Afar, perceived low benefit could be a relevant constraint (with more than 25 percent of respondents in this region noting this as the main reason for not having an account), while in Addis Ababa, Harari, and Dire Dawa, it is likely not, given the low percentage of respondents noting this as a reason (Figure 27).

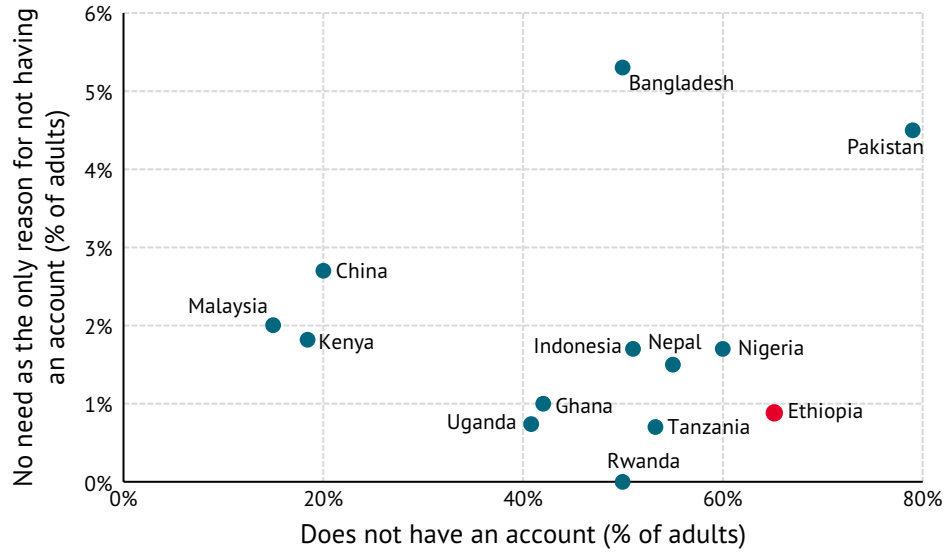
**Figure 27. Account ownership and perceived lack of benefit, Ethiopia, by region, 2018/19**



Source: CSA (2021).

The Findex data (World Bank 2018a) do not contain direct indicators for lack of perceived benefit of a bank account. However, the response “no need for an account,” when given as the only reason for not having one, serves as a proxy indicator. In Ethiopia, only 0.88 percent of those without a financial institution account reported that this is because they do not need one. In 2017, a large segment of the adult population (more than 65 percent) did not have accounts, but less than 1 percent reported not having an account because they did not need it (Figure 28). Findex data seem to indicate that most people do perceive the benefits of financial services.

Figure 28. No need for an account, Ethiopia and comparators, 2017



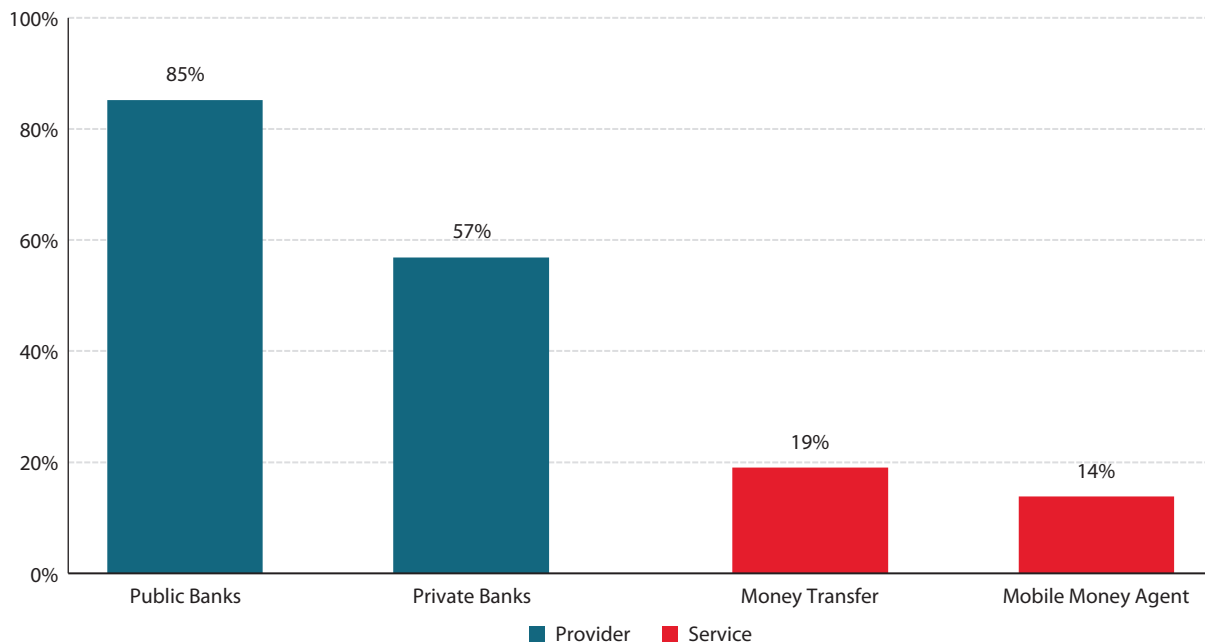
Source: World Bank (2018a).

An additional dimension of the perception of benefits is worth considering: awareness. If customers are not even aware of the services that are being provided, they will naturally not know the benefits that these services may yield. The ESS offers some stark statistics on awareness of and familiarity with financial providers and services. While most people are aware of the existence of the main financial service providers, very few know about the financial services they offer. In the country as a whole, 85.2 percent of the adult population were familiar<sup>74</sup> with public banks and 56.9 with private banks,<sup>75</sup> while only 19.0 percent were aware of the existence of money transfer services, and a mere 13.8 percent knew about mobile money agents (Figure 29). These results likely relate to the lack of DPS offerings, caused by supply-side binding constraints. This issue goes beyond banks and other traditional financial services, as many shops can become mobile money agents, but only 13.8 percent of adults (5.5 percent in rural areas) were familiar with such providers.

<sup>74</sup> Respondents were asked about whether they had heard of financial institutions like public and private banks and services like money transfers or mobile money agents.

<sup>75</sup> This difference of 30 percentage points further evidences the dominance and privileged position of the public-sector monopoly in DFS provision.

**Figure 29. Awareness of financial service providers and services (percentage of adults that had heard of provider/service), Ethiopia, 2018/19**



Source: CSA (2021).

The foregoing review of global databases and household survey information indicates that a perception of low benefit is unlikely to be a binding constraint on having a financial account in Ethiopia as a whole. However, the perception of low benefit is more predominant in certain regions, namely, Afar.<sup>76</sup> Moreover, while lack of awareness about mobile money services is prevalent in the country, this could be just a reflection of the identified supply-side binding constraints that dominate and limit the provision of these services.<sup>77</sup>

### 6.3. Remoteness: The urban-rural divide

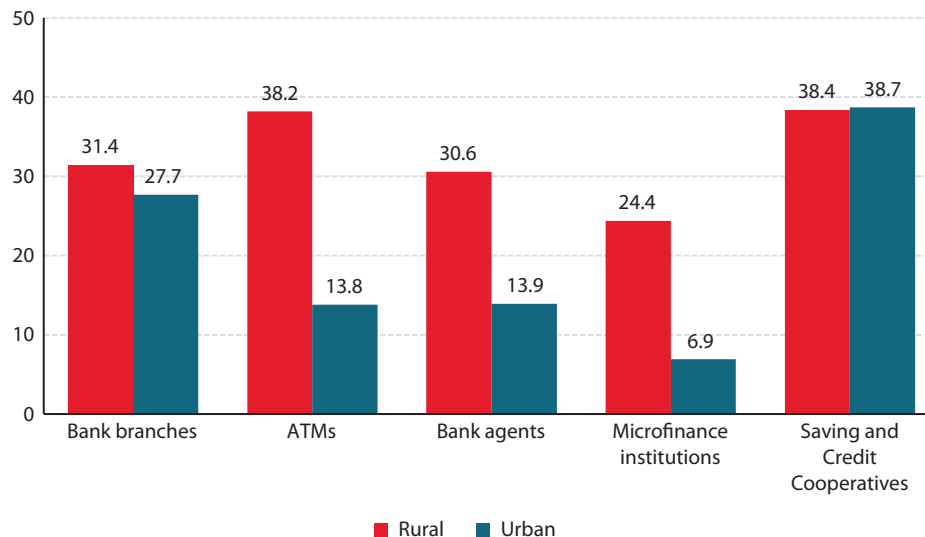
The 2018/19 ESS provides valuable information on the population's physical proximity to financial infrastructure and access points. Community leaders or representatives were asked how far bank branches, ATMs, bank agents, MFIs, and savings and credit cooperative organizations (SACCOs) were located from their community. On average, bank branches

<sup>76</sup> In addition, the ESS asked about lack of “understanding” of the benefit, which can be tied to low literacy levels, an issue that is particularly pervasive in rural areas (Planning and Development Commission 2018). Given the high illiteracy rate in rural areas, it could be difficult for some people to operate basic phones and make transactions. Some studies in Ethiopia have shown that high levels of digital illiteracy contributed to low usage of mobile money (Mercy Corps et al. 2017). This might suggest that lack of understanding of financial services could be a severe constraint on the demand for DPS in rural areas, where the problem of lack of literacy is more prevalent.

<sup>77</sup> Where services are not provided, one can think of the price of such services as being infinite—again indicating the presence of a supply-side constraint.

are 31.4 kilometers away from rural communities and small towns, while ATMs are 38.2 kilometers away (Figure 30). To reach a bank agent, populations in rural areas and small towns need to travel 30.6 kilometers, more than twice the 13.9 kilometers observed in urban areas (CSA 2021).<sup>78</sup>

**Figure 30. Distance to reach a financial service provider (kilometers), Ethiopia, 2018/19**



Source: CSA (2021).

The ESS offers this staggering statistic: only 18.6 percent of rural adults live within 5 kilometers of a formal financial service provider, while 89.8 percent of urban adults do (CSA 2021). Moreover, the concentration of financial services in urban areas is further incentivized by the availability of basic infrastructure, such as electricity.<sup>79</sup> Financial services, both digital and traditional, are simply not available to rural populations in Ethiopia—only 4 out of the 258 rural communities interviewed in the ESS had an ATM in their community, only 6 had a commercial bank, and 10 had bank agents (CSA 2021). Rural populations need to travel long distances to reach formal financial services, making even more obvious the potential benefits of DFS, which could help circumvent these constraints. However, as long as bank agents who can provide mobile money remain far away, access to DPS will continue to be a problem for a large segment of the population.

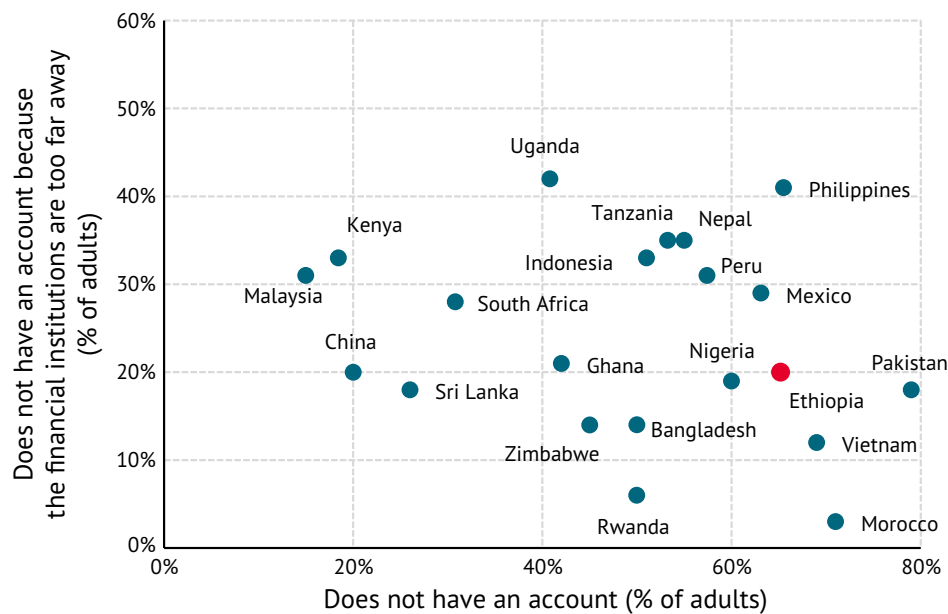
The Findex data indicate that about 20 percent of adults (ages 15+) without a financial account reported distance from financial institutions as one of the reasons for not having an account (World Bank 2018a). Figure 31 presents a scatter plot relating the perception

<sup>78</sup> In 2018/19, there were 12,863 bank agents across the country, with demographic penetration of 21.7 per 100,000 adult population, compared with 9.4 for bank branches.

<sup>79</sup> As noted in Section 5.1, only 32 percent of the rural population has access to electricity, compared with more than 95 percent in urban areas (*Economist Intelligence Unit* 2020).

of distance to a financial institution as a constraint and the percentage of adults without an account in a financial institution. In peer countries with a lower percentage of the adult population financially excluded than Ethiopia (e.g., Kenya, Tanzania, and Uganda), more than 33 percent reported distance as a reason for not having an account. The graph shows that distance is largely perceived as a constraint even in countries with much higher rates of financial inclusion than Ethiopia and where digital means have been very successful in fostering inclusion. In Ethiopia, where more than 60 percent of the adult population remains financially excluded, less than 15 percent indicated that distance was a constraint.

**Figure 31. Distance as a reason not to have an account with a financial institution, Ethiopia and comparators, 2017**

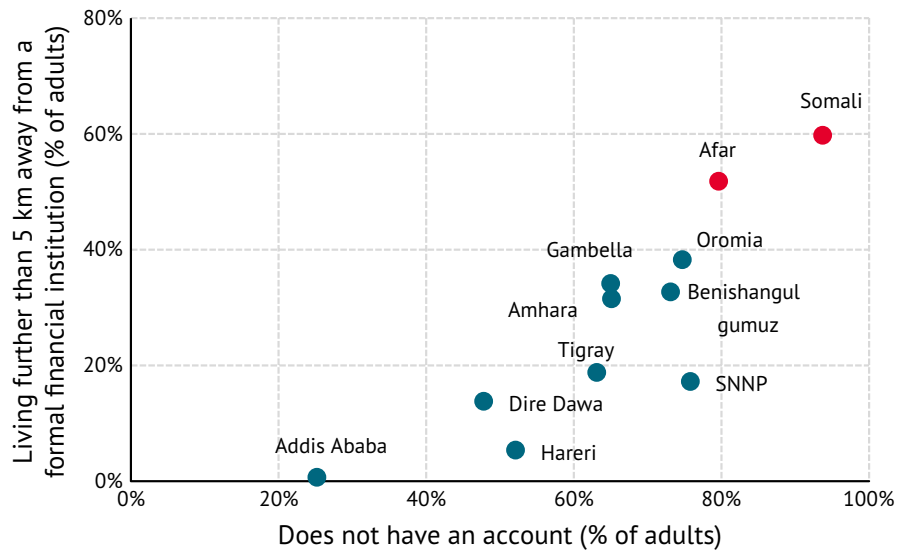


Source: World Bank (2018a).

Similarly, the 2018/19 ESS (CSA 2021) indicated that only 11.2 percent and 11.6 percent of individuals, respectively, reported remoteness as the first or second reason for not having a bank account (see Table 5). While we did not find significant differences between female and male respondents, distance is certainly a larger constraint for rural residents, as most bank branches and agents are concentrated in urban areas. About 14 percent of adults living in rural areas reported distance as a reason for not having an account, twice as many as in urban areas, with only 7 percent. The domestic banking infrastructure is concentrated in urban areas, with 35 percent of bank branches and 50 percent of ATMs located in Addis Ababa, where only 3.7 percent of the population lives (World Bank 2019b). Since banks are currently the dominant providers of DPS, this substantially limits the access of rural and remote populations to these services. Discussions with stakeholders indicate that investing in technology like ATMs is even more expensive than expanding branches and, while MFIs and SACCOs offer an alternative for providing financial services to rural populations, their penetration ratio is still very low (FAO 2019).

Some specific regions are particularly impacted by this situation, as Figure 32 shows. Addis Ababa is the only region where distance is clearly not a problem. In Dire Dawa and Hareri, at least 60 percent of adults have a formal financial institution within 5 kilometers. For the other 8 regions, distance could be a severe constraint.

**Figure 32. Distance and account ownership, Ethiopia, by region, 2018/19**



Source: CSA (2021).

Particularly in Somali, ESS data show that those who own an account are on average 60 kilometers closer to a financial institution than those who do not. In Afar, we can also see how people without this constraint—those living closer to a financial institution—have much higher rates of account ownership. On average, those who do not have an account live over 40 kilometers away from a financial institution (CSA 2021). Thus, in these areas, distance is likely a severe constraint that is also, in turn, related to the inadequate provision of financial services in most of the country.

## 6.4. Low income

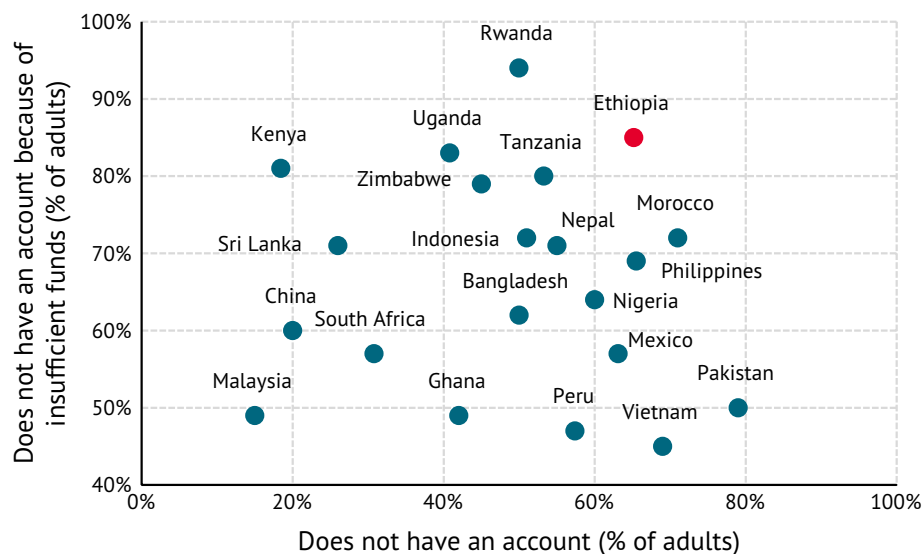
As explained by Claessens and Rojas-Suarez (2020), low income should not generally be a constraint on digital payment and transfer services since customers could simply be the recipients of transfers. Nevertheless, below, we explore the available data regarding perceptions of low income as a constraint, given the importance that ESS respondents give to this issue. Two caveats apply to this analysis. First, when someone perceives low income as an impediment to financial inclusion, this might be signaling that the fixed costs of accessing this service are too high. Given the limited availability of access points and the high cost of digital infrastructure in Ethiopia (see Section 5.1), low income might just be an additional indicator that supply-side constraints are prevalent. Second, survey questions do not distinguish between having an account in order to use it for payments and transfers,

or to use it for savings purposes.<sup>80</sup> Moreover, the ESS survey has a clear focus on savings, which might lead respondents to consider whether they have enough income to *save*, which is different from not having enough income to pay or *transfer*. Low income is a more important constraint on savings, which requires excess income, but in order to receive and transfer funds even very small levels of income might be enough.<sup>81</sup>

Despite these limitations, it is important to study and analyze low income as a constraint, which could still be binding for particularly poor segments of the population. Ethiopia is a low-income country, where 23.5 percent of the population live in abject poverty, below the national poverty line, which the latest estimates situate at less than US\$1 per day (US\$0.93 or ETB 19.68, to be precise).<sup>82</sup> The poverty situation is severe in rural areas, with 25.6 percent of the rural population living below the national poverty line, compared with 14.8 percent of the urban population (Planning and Development Commission 2019).

According to Findex data (World Bank 2018a), account ownership among the poorest 40 percent of the adult population is only 22 percent, half the level enjoyed by the richest 60 percent in 2017 (43 percent). About 85 percent of unbanked adults reported lack of funds as a reason (Bessir 2018). These data seem to suggest that low income is an important constraint on financial inclusion in most low- and lower-middle-income countries (e.g., Kenya, Uganda, and Rwanda), where a large share of the unbanked population reports lack of income among the reasons for not having an account (Figure 33).

**Figure 33. Lack of income as a reason for not having an account (among those without an account), Ethiopia and comparators, 2017**



Source: World Bank (2018a).

<sup>80</sup> Note that making such a distinction would imply analyzing two different decision trees.

<sup>81</sup> However, it should be noted that fees for small transfers of mobile money are particularly high in Ethiopia.

<sup>82</sup> The national poverty line was estimated at ETB 7,184 (US\$339) per year in 2015/16.

As indicated in Table 5 above, respondents to the 2018/19 ESS cited low income as the top reason for not opening a bank account (CSA 2021). About 43.8 percent and 20.9 percent of respondents, respectively, reported lack of income as the first or second reason in order of importance.

Adding a regional dimension may shed some light on how to assess low income as a potential binding constraint. While there are no significant differences between rural and urban areas (42.5 percent of those without a bank account in rural areas reported income as a reason, and 45.5 percent in urban areas) or across gender, there are substantial differences across regions.

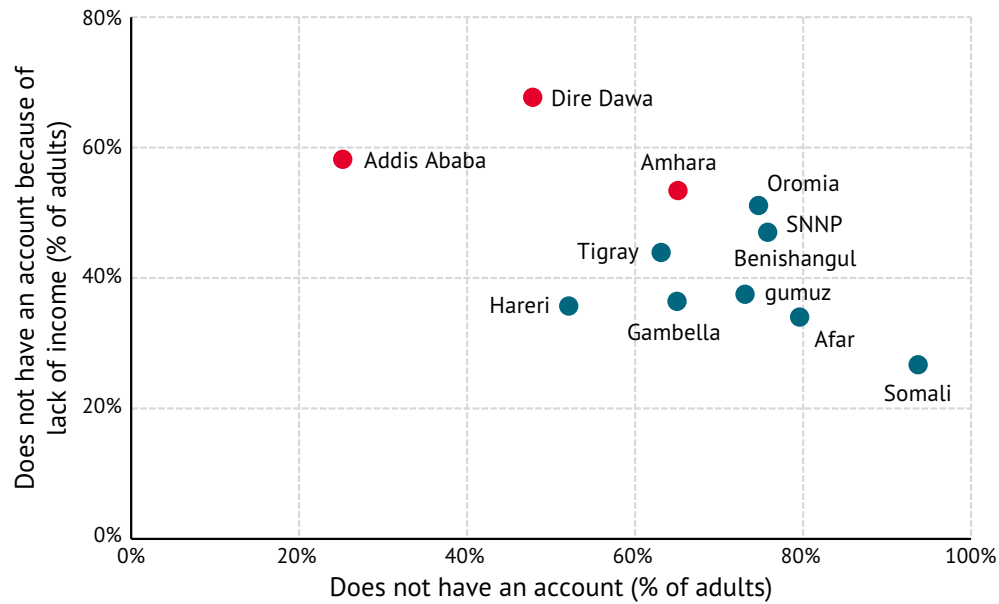
Low income as a reason for not having an account (among those without an account) is particularly high (above 50 percent) in Dire Dawa, Addis Ababa, and Amhara, which, surprisingly, are three of the regions with the highest levels of account ownership (Figure 34).<sup>83</sup> In regions with lower levels of financial inclusion (e.g., Somali and Afar), fewer unbanked people reported lack of income as a reason (less than 40 percent). A possible explanation for this apparent puzzle lies in the strong dominance of supply-side constraints over demand-side constraints in the country. Thus, in regions such as Addis Ababa, where DPS and other financial services are offered, the poorest segments of the population might perceive that they cannot afford the high prices charged for these services (resulting from the binding supply-side constraints described in Section 5). The price analysis in Section 4 showed that prices are particularly high as a percentage of the transaction for small amounts, with a disproportionate negative effect on poorer users. These populations will therefore tend to choose “lack of funds” as their reason for not having an account. In contrast, in regions such as Somali and Afar, where the binding supply-side constraints reflect an almost nonexistent offering of DPS, the majority of the population will provide a variety of other reasons (including distance and lack of awareness) for not having an account.

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<sup>83</sup> To be specific, in regions such as Addis Ababa, almost 75 percent of individuals are financially included. However, 25 percent remain financially excluded and, out of those, close to 60 percent reported lack of funds as the main reason.



**Figure 34. Lack of income as a reason for not having an account (among those without an account), Ethiopia, by region, 2018/19**



Source: CSA (2021).

As discussed in the next section, when suppliers have offered mobile money services in remote rural areas, even some low-income populations have used them. Thus, the evidence and analysis in this section reinforces the conclusion that while demand-side constraints may be severe, the true binding constraints are on the supply side.

## **7. Interactions between supply and demand constraints: are coordination failures a problem?**

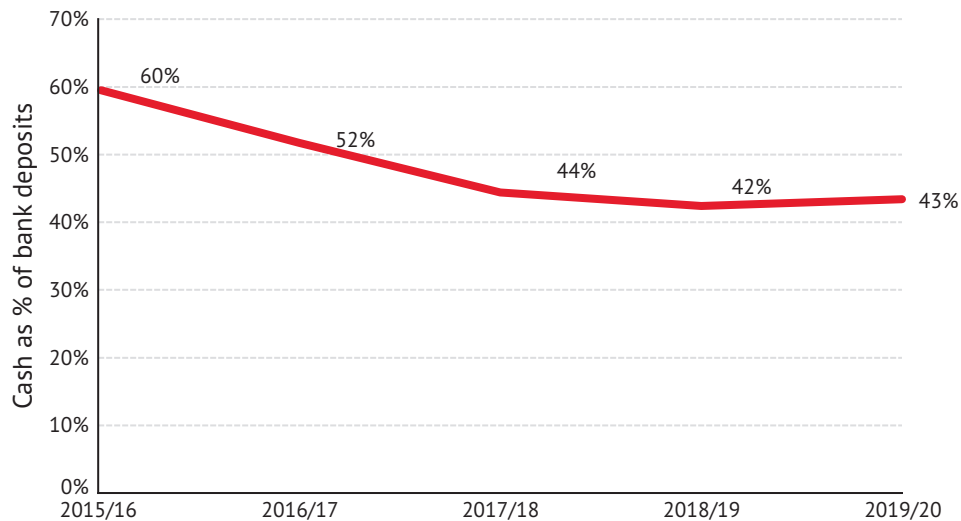
Coordination failures can hinder the provision of DFS. As indicated by Claessens and Rojas-Suarez (2020) and by Bourreau and Valletti (2015), mobile payment platforms involve interactions between the demand and supply sides that could result in inadequate equilibriums. On the demand side, if potential users do not expect others to join a platform (that is, if they expect that there will not be sufficient counterparts to transact with), the platform will not reach a critical mass. On the supply side, the provision of DPS requires economies of scale due to sunk costs related, for instance, to building agent networks and digital infrastructure. Thus, a platform lacking a critical mass of users would prevent an adequate supply of DFS, as providers cannot reach necessary economies of scale to be able to offer services at affordable prices while being profitable.

A common indicator used to identify the presence of coordination problems is a strong preference for cash. As indicated in the introduction, cash is the most common payment method in Ethiopia, by far. Paper-based payment instruments such as cash, checks, and

payment orders remain the dominant means of payment in Ethiopia. Between 2015/16 and 2019/20, cash in the hands of the public as a percentage of demand deposits was on average 49.5 percent (Figure 35). While decreasing, this trend has remained considerably high in recent years.

However, this strong usage of cash likely relates more to the provision (supply-side) problems we have analyzed in previous sections than to coordination problems involving interactions between demand and supply factors. A limited and expensive digital infrastructure in the country—especially in rural areas, where digital payment systems are not widely used—and a scarce competition between financial service providers create few options to be financially included in Ethiopia. In the absence of reliable and affordable electronic payment services, customers tend to depend on cash for their transactions.

**Figure 35. Ratio of cash outside of banks to bank deposits (percentage), Ethiopia, 2015/16–2019/20**



*Source:* NBE annual reports (various years).

Two interventions have suggested that even very poor populations could and were willing to use DPS if they got support and were provided the necessary infrastructure (for instance, through subsidies to buy mobile phones).<sup>84</sup>

- The Mercy Corps PRIME project, in collaboration with the Somali Microfinance Institution, introduced HelloCash to transfer payments to its clients in the Somali region, who did not have any previous experience using mobile money services

<sup>84</sup> Additional evidence also indicates that there are areas where cash transfer recipients do not use DPS simply because such services are not available (van Swinderen 2017).

(Mercy Corps et al. 2017).<sup>85</sup> While the project evaluation focused on saving behavior, it offers important insights about the interaction between supply- and demand-side constraints. The project was largely successful, as participants expressed their satisfaction with the service, and the uptake of digital transfer services was encouraging. However, 56 percent of survey respondents withdrew all their money—77 percent said one of the reasons for doing so was to take care of “household needs” and 27 percent said they “did not know how to use the account.” The first reason relates to the savings component of financial inclusion, further indicating that low income may be a binding constraint on savings, but not necessarily on payments. The intervention was successful in the uptake of DPS, despite not encouraging savings. The second reason, coupled with reports of challenges using “the technology or phone,” shows how demand-side constraints may be severe for specific subpopulations.<sup>86</sup> These demand-side issues could fuel coordination problems in the future but, given the low development of the DPS market and the lack of affordable digital infrastructure, are not yet a binding constraint. For instance, phone purchases were heavily subsidized in this project, making it obvious that affordable digital infrastructure is a necessary condition that is not satisfied in Ethiopia.

- With support from USAID, Food for the Hungry Ethiopia has been implementing a project known as Development Food Security Activity-Targeted Response for Agriculture, Income and Nutrition (DFSATRAIN) in Lay Gayint and Tach Gayint *woredas* of Amhara region. The project introduced mobile money services to disburse cash to project beneficiaries in the target *woredas*, who had no prior experience with mobile money services. In fact, many users had “low level of literacy and a few of them own[ed] mobile phones” (USAID and FH 2018, 6). A significant finding was that “more than 80 percent of survey participants preferred mobile cash transfer to the manual cash transfer” (USAID and FH 2018, 6), indicating a high degree of acceptance of DPS.

This evidence implies that coordination failures are likely not a problem, since demand-side constraints are not the key factors impeding the creation of a critical mass of customers. Rather, supply-side constraints do not even allow customers to make the decision of whether to use financial services.

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<sup>85</sup> The Somali Microfinance Institution has engaged in cash transfer programming for the United Nations Office for Project Services, the Ethiopian government’s Productive Safety Net Programme, the International Office of Migration, Oxfam, and others. HelloCash allows project beneficiaries to conduct basic banking services—making and receiving payments—using their mobile phones.

<sup>86</sup> However, 99 percent of participants were illiterate, suggesting that literacy was not a constraint for a majority of users.

## 8. Conclusions

Despite the clear potential that financial inclusion has, as success stories in the continent like Kenya's show, Ethiopia has not been able to significantly improve its financial inclusion levels; more than 70 million Ethiopians remain financially excluded and do not even access simple digital payment and transfer options. There are numerous potential explanations for this disappointing outcome, encompassing supply and demand factors, and all are partially true, but only a few are truly binding, effectively limiting the expansion of financial inclusion. In this paper, we have applied the Claessens and Rojas-Suarez (2020) methodology to identify those binding constraints.

Through a price analysis, we show that factors on the supply side are particularly concerning. Competition and unlevel playing field issues in the digital infrastructure and financial sectors are severe constraints—reflected in the dominance of two state-owned enterprises (Ethio Telecom and the CBE) in these markets.

Digital infrastructure, which is a necessary condition to achieve financial inclusion, is not affordable for many, and Ethio Telecom basically holds a public monopoly in this market.<sup>87</sup> In the financial sector, the CBE has a privileged position—and Ethio Telecom will likely have one as well when nonfinancial providers are allowed to offer mobile money, as envisaged in Directives No. ONPS/01/2020 and No. ONPS/02/2020 (NBE 2020a, 2020b). The CBE's and Ethio Telecom's power is reinforced and perpetuated by rules that favor them. For instance, the CBE is the sole provider of certain services (i.e., utility payments and public salaries), which helps it expand its customer base, and foreign providers are currently excluded from both the digital infrastructure and the financial services markets.

But what is causing this lack of competition and unlevel playing field? Our analysis shows that some glaring institutional deficiencies are behind the competition problems. Ultimately, until these institutional deficiencies are resolved, competition and unlevel playing field issues will persist, impeding the full development of DPS in Ethiopia.

Two institutional deficiencies are particularly noteworthy: the capacity inadequacies of key regulatory institutions (the NBE and ECA), often cited by local and international actors as a problem, and the unwillingness of the government to relinquish control of key economic (and political) sectors. The NBE's and ECA's lack of capacity to regulate and supervise a growing market has stifled and slowed down liberalization reforms in the telecommunications sector and served as a reason to limit the entrance of new (and foreign) players into the financial sector. Despite continuous efforts by international organizations like

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<sup>87</sup> As noted in section 5.1, recent changes allowing for a foreign consortium led by Safaricom to enter the telecommunications sector may relax this constraint. However, the consortium will not start operating until 2022, and telecoms, with the exception of Ethio Telecom, cannot yet offer DFS in Ethiopia. Further, affordable digital infrastructure is a necessary but not sufficient condition for complete digital financial inclusion. Overall, this news is a positive signal, but, unless constraints in both the digital infrastructure and the financial services sector are fully addressed, we do not expect the country's levels of financial inclusion to substantially improve.

the World Bank and the IMF to support these institutions, these problems persist. The NBE, for instance, is understaffed and suffers high turnover, while current employees lack proper training and experience. In addition, the unwillingness of the central government to give up control of the telecommunications sector has both economic and political reasons. First, the government has used Ethio Telecom profits to finance its investment expenditures and thus wants to maintain the company's monopoly power. Second, the government has found it convenient to maintain control of the communications sector since this allows to suspend communications in times of unrest, censor opposing media and political actors and filter content. Moreover, the unwillingness to promote competition in the financial sector is also reflected in the lack of independence of the central bank—a strong and independent central bank would be a crucial sign of positive institutional development.

These two deficiencies also interact, as the government often claims that the lack of capacity of domestic regulatory institutions—and of the local private telecommunications and financial services sectors—is another reason not to open the markets to foreign competition. International comparisons show the precarious situation of institutions in Ethiopia and their stakeholders' incapacity and unwillingness to promote competition, the very factor that could boost the adequate provisioning of DPS. For all of these reasons, institutional deficiencies are the binding constraint in Ethiopia.

Demand-side constraints do not appear to be binding at the country level but may be severe in certain areas. Low perceptions of benefits are generally not concerning in most regions, with the exception of Afar, but awareness of financial products (a necessary condition to recognize the benefits of DFS) is particularly low in some regions. Thus, low perception of benefits could be binding for some subpopulations. Similarly, distance could be an issue in remote and rural areas like Somali, and low income levels are a concern reported by populations in the poor urban areas of Addis Ababa, as well as Dire Dawa and Amhara. However, it is complicated to disentangle this perception of not having sufficient funds to use DPS from the fact that, in international comparisons, the prices of these services are very high in Ethiopia, particularly for small transactions, and that fixed costs related to digital infrastructure are also substantial. Finally, lack of trust in providers is a constraint we can clearly discard, as it is not perceived as an issue. Overall, the analysis of the demand side reinforces the argument that supply-side constraints are the root cause of low financial inclusion.

We found additional evidence that the supply-side constraints dominate—when services are offered at affordable prices, as exemplified by the two interventions discussed in the last section, the uptake of DFS has been quite successful, even in remote, rural, and low-income areas. As long as prices remain high and the offering of these services remains limited due to the competition problems generated by institutional deficiencies, demand-side constraints will interact with the supply-side problems but will not be binding. Solving the institutional problems would relax the competition constraints and potentially facilitate DPS to reach their untapped potential in Ethiopia.

## 9. Appendixes

### Appendix 1. Providers and digital payment services

Table A1.1. Mapping of providers with DPS

No.	Service	ATM	PoS	Internet banking	Mobile banking	Mobile money (Name of platform)
Commercial Banks						
1	Abay Bank	✓	✓	✓	✓	✓ (Abay Bedje)
2	Abyssinia Bank	✓	✓	✓	✓	✓ (Gize Pay)
3	Addis International Bank	✓	✓	✓	✓	✗
4	Awash Bank	✓	✓	✓	✓	✓ (M-Wallet)
5	Berhan International Bank	✓	✓	✓	✓	✓ (Berhan Mobile)
6	Buna International Bank	✓	✓	✓	✓	✓ (Wallet Money)
7	Commercial Bank of Ethiopia	✓	✓	✓	✓	✓ (CBE-Birr)
8	Dashen Bank	✓	✓	✓	✓	✓ (Amole)
9	Debub Global Bank	✓	✗	✗	✗	✗
10	Enat Bank	✓	✓	✓	✓	✓ (Enat Wallet)
11	Lion International Bank	✓	✗	✓	✓	✓ (HelloCash)
12	Nib International Bank	✓	✓	✓	✓	✗
13	Oromia International Bank	✓	✗	✓	✓	✓ (Oro cash)
14	Cooperative Bank of Oromia	✓	✓	✓	✓	✓ (Coopay)
15	United Bank	✓	✓	✓	✓	✓ (Hiber Wallet)
16	Wegagen Bank	✓	✓	✓	✓	✓ (HelloCash)
17	Zemen Bank	✓	✓	✓	✓	✗
Microfinance Institutions						
1	Addis Credit and Savings Institution	✗	✗	✗	✗	✓ (M-Birr)
2	Amhara Credit and Savings Institution	✗	✗	✗	✗	✓ (M-Birr)
3	Dedebit Credit and Savings Institution	✗	✗	✗	✗	✓ (M-Birr)
4	OMO Microfinance	✗	✗	✗	✗	✓ (M-Birr)
5	Oromia Credit and Savings	✗	✗	✗	✗	✓ (M-Birr)
6	Somali Microfinance	✗	✗	✗	✗	✓ (HelloCash)
7	Peace Microfinance	✗	✗	✗	✗	✓ (M-Birr)

Source: Compiled by authors.

## Appendix 2. The decision tree methodology: Further details

This appendix extends the discussion in Section 3 by providing additional details regarding the methodology used in this paper. The complete analytical framework, the principles of the methodology, and numerous examples can be found in Claessens and Rojas-Suarez's 2020 paper "A Decision Tree for Digital Financial Inclusion Policymaking."

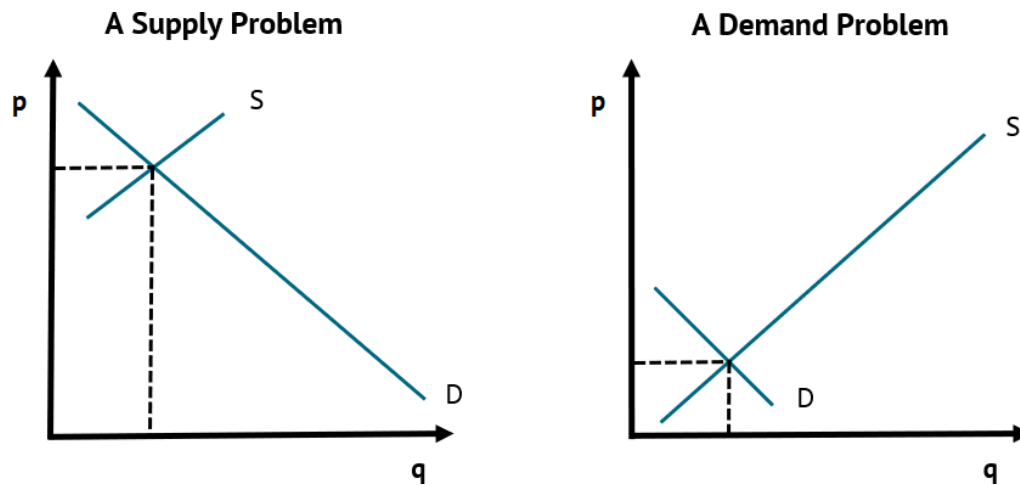
The methodology is inspired by Hausmann and coauthors' work on growth diagnostics (the 2005 "Growth Diagnostics" and the 2008 "Doing Growth Diagnostics in Practice"), which created a decision tree to identify the binding constraints on growth in developing economies—that is, the factors that are preventing countries from reaching their growth potential. The motivation behind this framework is to offer a diagnostic tool that will help policymakers to prioritize policy in areas where actions are needed the most and can have a larger impact. Many factors can be constraints; indeed, all the branches in the decision tree are determinants of financial inclusion, but the methodology seeks to find those that are *binding*.

Hence, the decision tree for digital financial inclusion outlines a set of potential constraints that analysts have to evaluate in order to determine which are binding, in the sense that they are the root cause limiting the expansion of financial inclusion. Claessens and Rojas-Suarez offered three different trees for payment, store of value, and credit services, though some constraints are naturally common for the three trees. These trees have served as a guide in the search for the binding constraints on digital payments and transfers in Ethiopia.

The decision tree for digital payments and transfers is presented in Figure 2 in Section 3. We evaluate all the branches (and sub-branches) of the tree to identify the binding constraints on financial inclusion, applying the following principles:

1. ***Prices of financial services are key indicators to determine whether binding constraints are (likely) on the demand or the supply side.*** Observing low quantities (low usage) does not indicate whether the constraints are affecting providers or consumers. Analysts can get an *initial* idea of whether binding constraints are on the supply or the demand side by considering prices, though they should evaluate all the branches in the tree individually. Generally, if the price of a service is relatively high compared with either another similar service or the (properly adjusted) customary price charged in other countries with similar levels of development, it indicates the existence of supply-side constraints (left graph in Figure A2.1). This suggests that providers are willing to supply the service only at a high price (due to high costs or other distortions related to supply-side constraints). These high prices, as a result, exclude significant proportions of the population, who cannot afford the service. On the other hand, if the price is relatively low, this would indicate a demand-side problem, since users are unable or unwilling to use the service despite its low price (right graph in Figure A2.1).

Figure A2.1. Distinguishing between supply and demand problems



Source: Claessens and Rojas-Suarez (2020), taken from Hausmann et al. (2008).

Note:  $S$  and  $D$  represent, respectively, the supply of and demand for a financial service, and  $p$  and  $q$  represent, respectively, the price and quantity used of that service. Actual usage occurs at the intersection of both curves.

In addition, in many cases, it is necessary to consider a broader definition of prices, accounting for potential unobserved shadow prices and other factors, such as opportunity costs, that affect the market equilibrium. A clear example of this is geographical constraints, where the opportunity cost of displacement is built in for customers and might cause low demand.

The three other principles indicate that a constraint is likely binding:

2. ***If relaxing the constraint results in a significant change in usage*** or other relevant behaviors. For example, if reducing or eliminating certain taxes on payment services causes a sharp rise in the usage of the service
3. ***If agents are trying to overcome or bypass the constraint*** by using either alternative equivalent services such as informal lending (when analyzing credit markets) or a combination of other, less efficient, financial instruments
4. ***If agents less intensive in that constraint are thriving***—that is, if the constraint affects only a subpopulation and those not affected by it are largely financially included. For example, in countries where institutional and governance quality is low, the ability to use financial services may depend on factors other than those driving the sound conduct of business, such as political connections. If so, one should observe that those with privilege to use the services do better than what is expected given their capacities.



Further considerations to take into account when using the decision tree methodology include the following:

- ***When assessing whether a constraint (branch in the tree) is binding, analysts need to consider as many indicators as possible, including hard data as well as surveys reflecting perceptions.*** Claessens and Rojas-Suarez suggested possible indicators to use on each of the branches, but analysts should select a set of indicators based on the specific characteristics and context of both the services and the country under study. Data should encompass both aggregate and microlevel statistics.
- ***Keep in mind that removing nonbinding constraints might be necessary to expose a binding constraint.*** For instance, allowing mobile money to operate by law can ease a constraint but, while necessary, it might not be sufficient to improve financial inclusion. Relaxing this constraint might instead help to uncover a truly binding constraint, such as the lack of a critical mass of customers (a coordination problem).
- ***Acknowledge that branches can interrelate.*** In some cases, to fully evaluate a branch requires analyzing others. Analysts should draw these connections and assess which indicators to use in each of the branches to evaluate them.

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