

An analysis of the Level One Project Principles and the gender gap in financial services

*Aggregated financial activity across Bangladesh,
Côte d'Ivoire, Kenya, Nigeria, and South Africa*

BILL & MELINDA
GATES foundation



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1 Overview

In this section

Project background, context, and summary of methodology.

A quantitative study to better understand how DFS use differs between women and men, and how L1P Principles may impact those differences

The Level One Project (L1P) principles outline a series of design choices that shape the deployment of digital payment infrastructure. These principles are intended to result in systems that are as low-cost, inclusive, and accessible as possible to low-income consumers in the Global South.¹

In order to understand how the L1P Principles may impact the gender gap in financial inclusion, the Bill and Melinda Gates Foundation asked Caribou Digital to conduct a multi-modal research project to evaluate whether any of the L1P Principles may mitigate, or exacerbate, the adoption and use of DFS by women. Caribou Digital conducted expert interviews and field work with end users across two markets, Kenya and Côte d'Ivoire, to explore this research question.

In addition, the Caribou Data team conducted a quantitative analysis of DFS activity and behavior patterns, disaggregated by gender, across Kenya, Côte d'Ivoire, Nigeria, South Africa, and Bangladesh.

This Caribou Data study is likely the first cross-platform, cross-network analysis of gender differences in actual financial activity in the Global South. Unlike surveys, interviews, diaries, and other forms of self-reported data, it comprises actual transactions and behaviors shared directly from the device, and therefore avoids reporting and recall biases.

Caribou Data recruits representative panels of 1,000+ smartphone users per market, and compensates each panelist with airtime for every month that they share their mobile data with our service. All data is anonymized on the device, and further protected through differential privacy controls that maintain sufficient aggregation in all analyses. See Appendix A for more details on our methodology.

We hope that this work provides donors, practitioners, and researchers with a better understanding of how women and men engage with DFS in different ways, and serves as a baseline measurement to evaluate future progress or specific interventions in this space.

We assess the potential impact of four L1P Principles on gender using a series of DFS activity snapshots from different markets

L1P principle

Analysis

Interoperability

DFSPs, including both banks and licensed non-bank transaction account providers, are eligible to be direct participants in the scheme

We show examples of interoperable payments, including bank transactions in Nigeria and the adoption of integrated products in Kenya. We also show behavior that reflects consumers' attempts to circumvent the limits of non-interop systems, such as multi-homing bank accounts in South Africa and Nigeria.

User experience

The user interface is simple and intuitive for a consumer; the user interface is designed to prevent user errors and fraudulent activity

Across all markets, we show that women are more likely than men to use financial apps, and that those who do use apps are more intensive DFS users. Yet the vast majority of transactions still occur over USSD/STK (even on smartphones). This may be less about the UI of apps *per se* and more to do with the data costs (perceived and real) of OTT app usage.

User fees

Fees to end users (individuals, merchants, etc.) should be zero or low, and may vary by use case

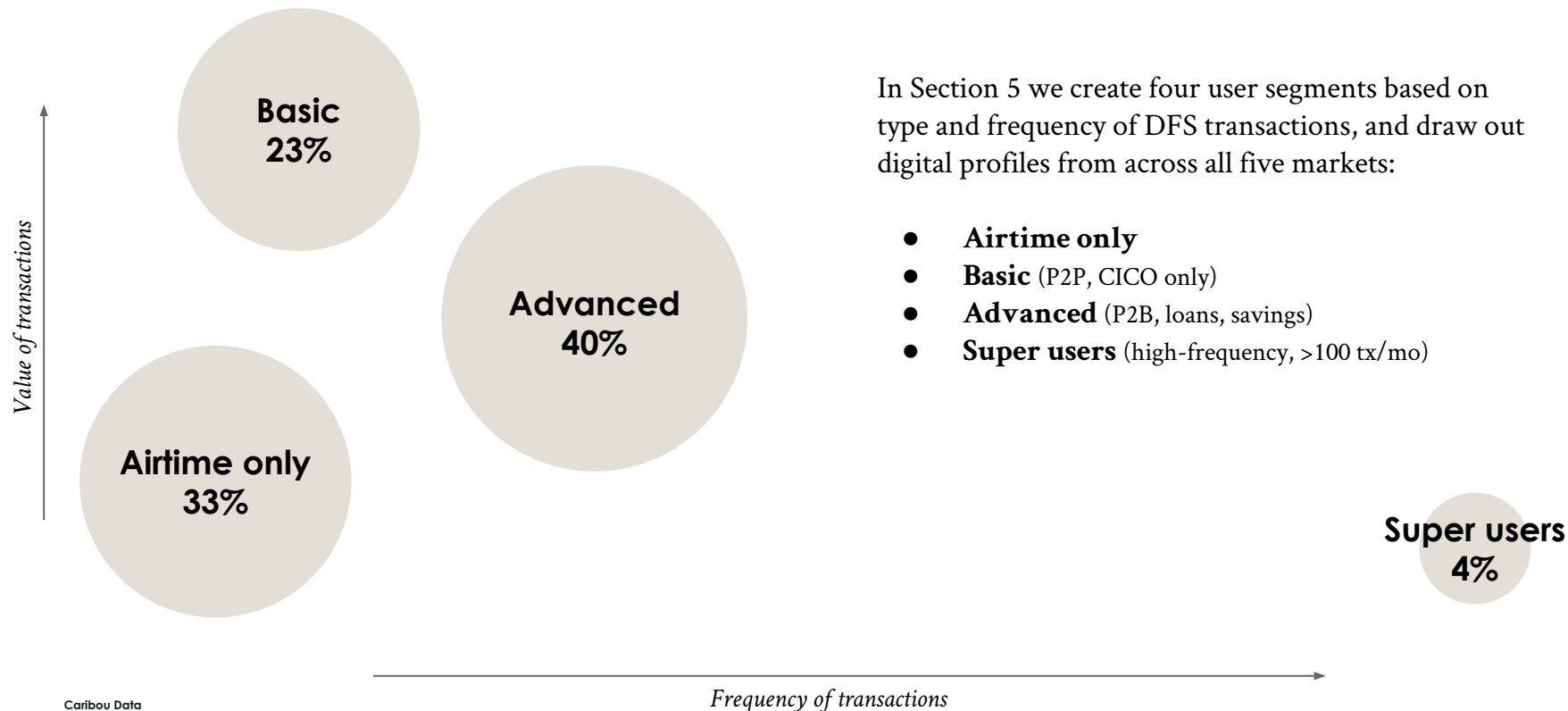
Because high fees deter usage, especially among marginalized populations, we use examples from Kenya and Côte d'Ivoire to assess the current state of fees borne by each gender. We also show clear examples of fee avoidance behavior in P2P transactions as well as airtime advances.

Device quality

All primary functions should be accessible to users with inexpensive basic/feature phones

In all markets, women are more likely to own lower-quality devices, an additional barrier to easily use financial services apps. We also show that individuals with higher-quality devices make higher-value transactions, and do them more frequently.

We then apply a simple segmentation across all panellists, providing insights into the digital profiles associated with advanced DFS use



2 Key insights

In this section

The top takeaways from the research.

Key insights into DFS activity

Gender differences are lower at higher socioeconomic levels — Our panels of smartphone users showed surprising gender parity for many high-level indicators, suggesting that some barriers may diminish for women higher on the socioeconomic scale

Yet our data show women are being excluded in multiple ways — Women own lower-quality phones, are less likely to use financial apps, pay more in fees, and are less likely to use advanced DFS products such as digital savings and loans

Financial activity is highly concentrated — Even among higher socioeconomic tiers, only 9% of individuals make at least one transaction per day, yet that 9% are responsible for 63% of all transactions (excluding top-ups)

Advanced DFS users tend to transact more frequently, for lower values — As individuals increase the intensity of their DFS use, they tend to make more transactions, but for lower average values

Higher intensity digital behavior correlates to advanced DFS use — Individuals who use apps (financial or otherwise) more frequently for longer periods of time, and those who consume more data, are also more likely to conduct more advanced DFS

USSD is still dominant — Even among smartphone users, almost 90% of transactions are being made over USSD or SIM toolkit vs. apps, and women are 2x -5x as likely as men to rely on USSD

3 Market overviews

In this section

We summarize the DFS market landscapes of Bangladesh, Côte d'Ivoire, Kenya, Nigeria, and South Africa with high-level market indicators.

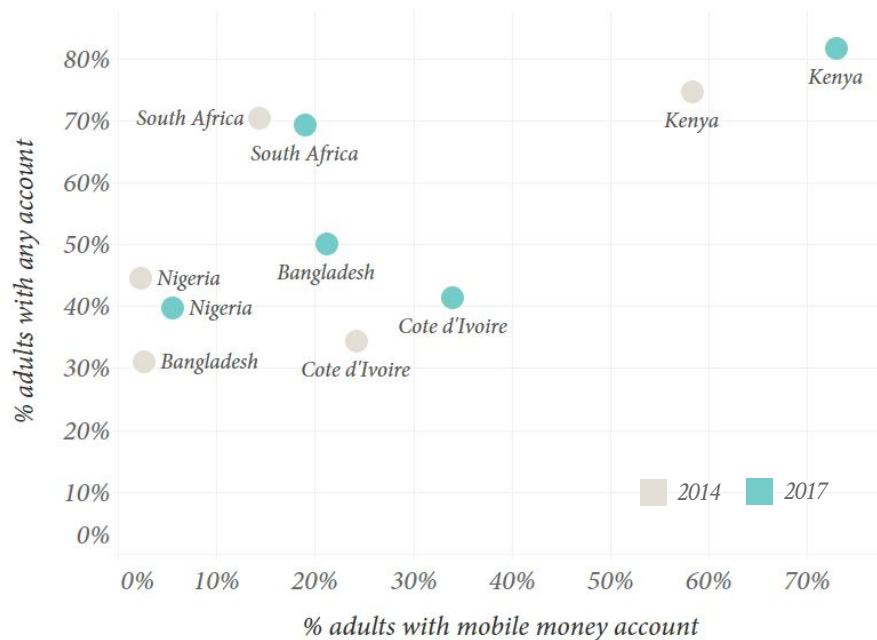
A multi-country study of diverse DFS markets highlights different dynamics impacting financial inclusion

Broadly speaking, the mobile money-led markets have seen the largest increases from 2014-17, due almost exclusively to new mobile money account registrations. **Bangladesh** has reached 50% financial inclusion, though many of these are still via MFIs or other traditional accounts, and many users use OTC instead of registering their own mobile money account (and thus don't appear in our digital data). **Côte d'Ivoire** enjoys higher mobile money account ownership (34%) in part from strong state promotional efforts around bill pay. **Kenya** outranks its peers in most DFS categories based on popularity of M-Pesa, whose quasi-monopoly status actually creates a dynamic similar to a highly interoperable market.

In contrast, the bank-led markets here have actually seen slight decreases in overall account ownership. **Nigeria** relies almost exclusively on bank accounts and cards with negligible mobile money adoption, yet has a thriving market for OTT fintech firms such as Paga, Opay, and Carbon that are competing with the banks. **South Africa** has a less diverse market, with few consumer-facing fintechs and low levels of mobile money. Consumers mostly rely on the major banks, and given its higher-income much of that activity is via PCs instead of mobile phone.

Financial inclusion indicators

Index, 2014 and 2017



The 40% of Nigerian adults who are banked use traditional bank accounts, though fintechs are rising and operators are resurrecting mobile money

With a very large population of mobile users (98 million unique subscribers¹) yet negligible mobile money use (3% of adults²), Nigeria has been labeled one of Africa's "mobile money sleeping giants."³

Nigeria has a severe gender gap, with 51% of men and only 27% of women banked.⁴ Both gender primarily use full-service banks such as GTBank, Access Bank, UBA, Zenith, and First Bank. All banks offer mobile apps, but also support USSD for common transactions, including payments, account transfers, top-up, loans, and pre-paid utility bills.

In addition, Nigeria has been an epicenter for fintech firms developing new OTT products for consumers and businesses. Some of the most popular consumer products, including OPay, Paga, and Carbon, offer app-based wallets with the full range of financial services.

Whereas the banks rely on their networks of ATMs to

facilitate non-branch CICO transactions, both OPay and Paga are trying to build out agent networks to enable CICO, with a claimed 40k and 23k agents respectively.⁵

The payment landscape is complicated further with the growing popularity of card transactions, which are the dominant form of P2B or merchant payments (growing from 29.4M transactions in 2018 to 41.8M in 2019⁶). The provision of POS (point of sale) terminals and associated services is therefore a significant element of go-to-market strategies for banks and fintechs targeting the SME sector.

The result of this mix is a bank-dominated consumer financial services market that is seeing real challenges from well-funded fintech entrants. And with new changes to the regulatory environment, operators are reconsidering mobile money—MTN is launching its new MoMo product, starting in South West region.


In Nigeria, most transactions are from bank accounts (apps and USSD), with some fintech wallets, and high levels of activity by women

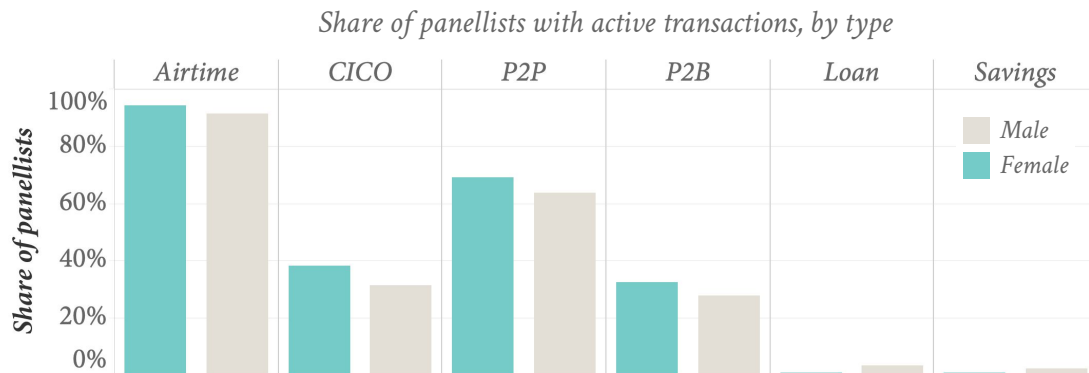
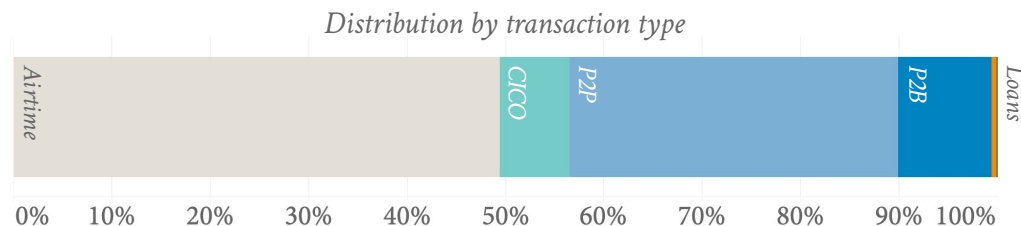
The Nigerian DFS market is characterized by a diversity of providers and use cases. Most transactions are executed from a bank account at one of a dozen major banks, with Access Bank, GTBank, UBA, and Zenith topping the list.

As expected, top-ups and P2P transactions are the dominant use case, but we see a number of P2B (merchant/bill pay) and loan transactions, the latter mostly via specialized digital credit providers. CICO withdrawals are common via ATMs, though deposits are under-represented in the mobile data due to branch deposits.

We see only slight variations in share of women vs. men conducting different types of transactions, the largest gap being women being 9 percentage points more likely to do CICO.

Overview of transaction types, frequency, value

Nigeria, 2019  Caribou Data • insights built on privacy



South Africa maintains a traditional bank-led market, with heavy reliance on cards and few consumer-facing fintech options

South Africa enjoys a relatively high rate of access to financial services, with an estimated 69% of adults formally banked, and an inverse gender gap, with 2 percentage points more men than women having access to an account.¹ The vast majority of these use traditional full-service banks, including Standard Bank, FNB, Absa, and Nedbank.

However, a bank account is often a condition of employment or a requirement for receipt of social services payments, and many people withdraw money as soon as they receive it.² Therefore the banked population may overstate the degree of meaningful usage of DFS.

Like Nigeria, mobile money has failed to take off in South Africa. Vodacom tried to bring M-Pesa to the market, but was unsuccessful and shut down the service in March 2016, the same year MTN closed its own offering. However, MTN announced in late 2019 that it was going to re-launch its mobile money service.

South Africans also rely heavily on cards to conduct transactions, with approximately 80M bank cards and 17M Social Security Agency (SASSA) cards in circulation. Bank branches and ATMs are used for CICO, with banks increasingly pushing customers to lower-fee ATM use.³

While South Africa remains a big market for fintech investment, there are no dominant consumer wallet or payment solutions; instead the largest fintech names are backend solution providers (e.g. Jumo) or B2B merchant players (e.g. Yoco).

Instead, new consumer-facing products are being offered by retailers, such as Shoprite, who has leveraged its trusted brand to launch a closed mobile money system offering payments, bill pay (including prepaid utility), airtime top-ups, and international remittances using its retail footprint to enable CICO.⁴

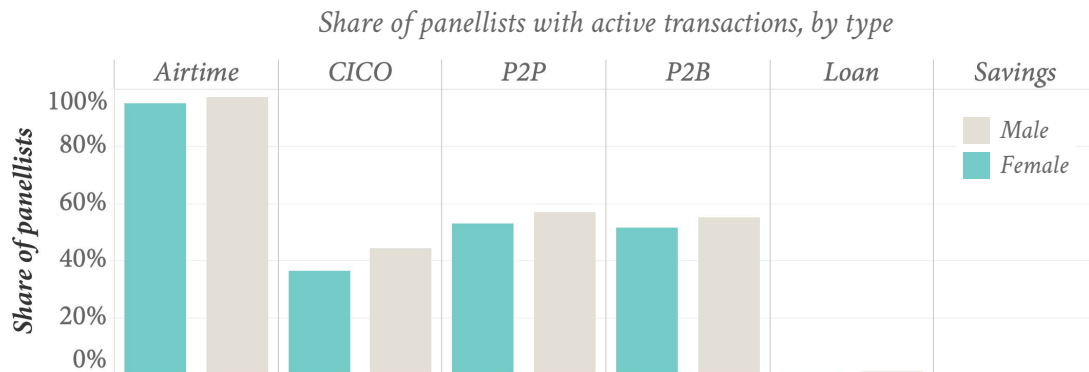
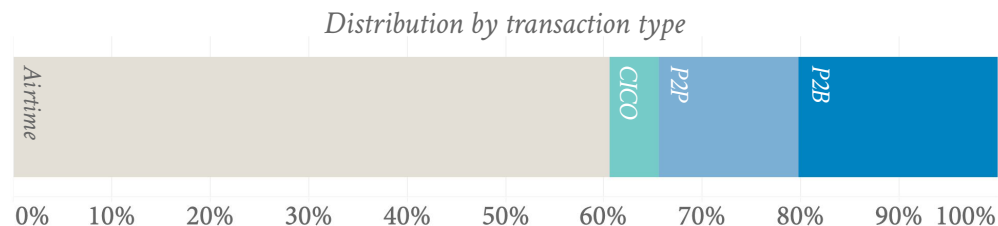
In South Africa, airtime top-ups dominate digital transactional activity, with relatively fewer bank account and advanced DFS transactions

The South Africa data is dominated by airtime top-ups with the mobile operators, with a relatively small share of bank account transactions. This may be in part because many South Africans—14 million—withdraw funds as cash as soon as they are deposited in their bank account (from salary or social payments).¹

Because the data are from mobile-based transactions, transaction activity from cards, online banking via PCs, and in-branch visits may not be represented. For example, a bank loan secured at a branch will not appear, but a loan administered via a smartphone app likely will.

Overview of transaction types, frequency, value

South Africa, 2019  Caribou Data • insights built on privacy



The dominance of M-Pesa has led to deep penetration of mobile money and a flourishing ecosystem of new OTT fintech players

The deep penetration of M-Pesa in Kenya has led to some of the highest rates of DFS adoption in the Global South. This extensive user base and supportive regulatory environment has led Kenya to become an epicenter of new fintech innovation, with everything from PAYGO solar to digital credit and micro-insurance.

But the removal of friction from financial services isn't always an unalloyed good, and many Kenyans are struggling with the effects of predatory loans, credit blacklisting, and pervasive sports gambling.

Overall between 73% -82% of Kenyan adults are banked, and while almost all of them (98%) have a mobile money account, 29% also have a full-service bank account as well. Basic payments activity is pervasive, and advanced DFS (savings, loans, P2B, etc) is conducted by a full 60% of adults.^{1,2}

The gender gap is relatively small at only 8 percentage point difference (86% of men and 78% of women).²

Safaricom holds a 63% SIM share of the mobile market while M-Pesa is also the dominant form of mobile money. The agent network is ubiquitous, with 150k agents nationwide (66% of Kenyans live within 1 km of an agent), and Safaricom has continued to build out new products such as M-Shwari (savings + loans), Fuliza (overdraft protection), and M-Tiba (health savings).

In April 2018 the major mobile money providers finally launched interoperability, allowing users to send payments directly and instantly to wallets with another provider,³ with the same fee structure, however this has seen very low uptake.

A robust and mature DFS market shows a diversity of transaction types and high levels of usage across both genders

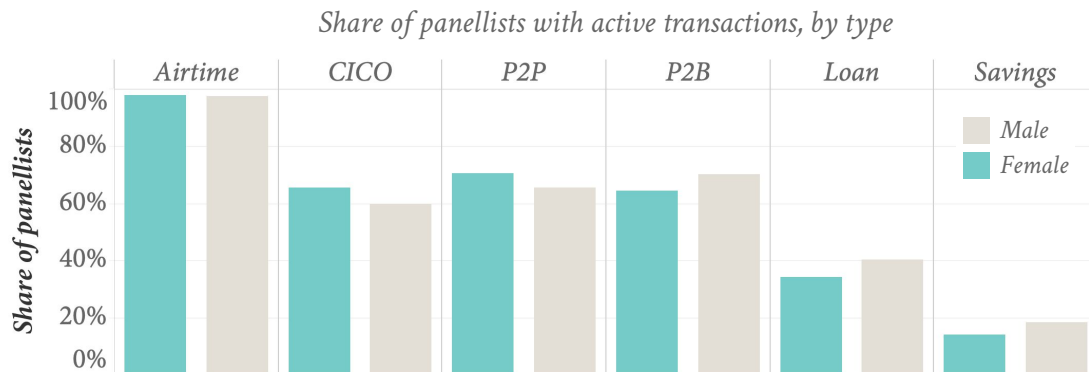
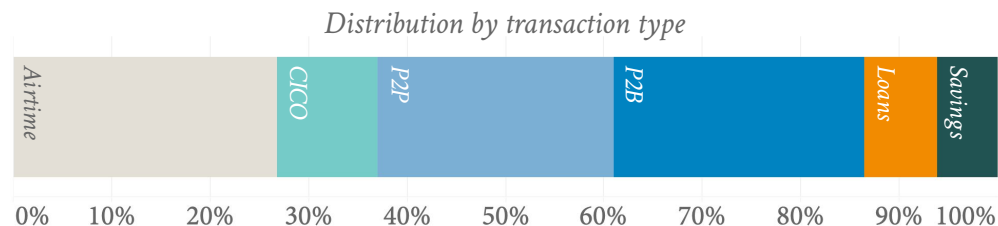
Kenya has the highest rates of advanced DFS use, with large segments of the population making P2B (merchant payments, bill pay) transactions, along with robust savings and loans activity.

The high level of savings activity is likely due to the tight integration of M-Shwari, a savings and loan product launched by Safaricom and CBA, with M-Pesa. The loans activity reflect bank products but also a large number of third-party providers, including Branch, Tala, and FairMoney.

The share of panellists conducting each type of transaction is relatively similar across genders, with a slight male bias in P2B, loans, and savings.

Overview of transaction types, frequency, value

Kenya, 2019  Caribou Data • insights built on privacy



State initiatives have helped push financial services to 47% of adults in Bangladesh, with a mix of mobile money, bank, and non-bank accounts

Government initiatives in Bangladesh, especially those around increasing agent banking, have led to positive increases in bank account usage, including in rural areas. However, tighter restrictions on mobile money have led to stalled growth in the number of account holders.

The overall result is a relatively balanced market of financial service adoption, with 17% of adults having a registered mobile money account, 25% having a full-service bank account, and 23% having a non-bank (e.g. MFI) account.¹

While there are a handful of mobile money providers, bKash is dominant with upward of 60% market share, followed by DBBL Rocket with 17% of the market.²

Measuring mobile money usage is complicated by the high rate of OTC agent transactions, where users without a registered account rely on the agent to send/receive payments. A total of 64% of bKash users don't actually have an account but use agents to perform OTC transactions.³

Despite recent efforts by the government to increase the number of women using financial services, the gender gap is wide and persistent. The gap is 10 percentage points for formal banking (30% of men, 20% of women) and 14 percentage points for mobile money (24% men, 10% women). This latter is no doubt in part driven by the gap in mobile phone ownership, where 84% of men and only 59% of women own a device.⁴

The Bangladesh market shows very low levels of advanced DFS use, and even low levels of P2P due to the prominence of OTC transactions

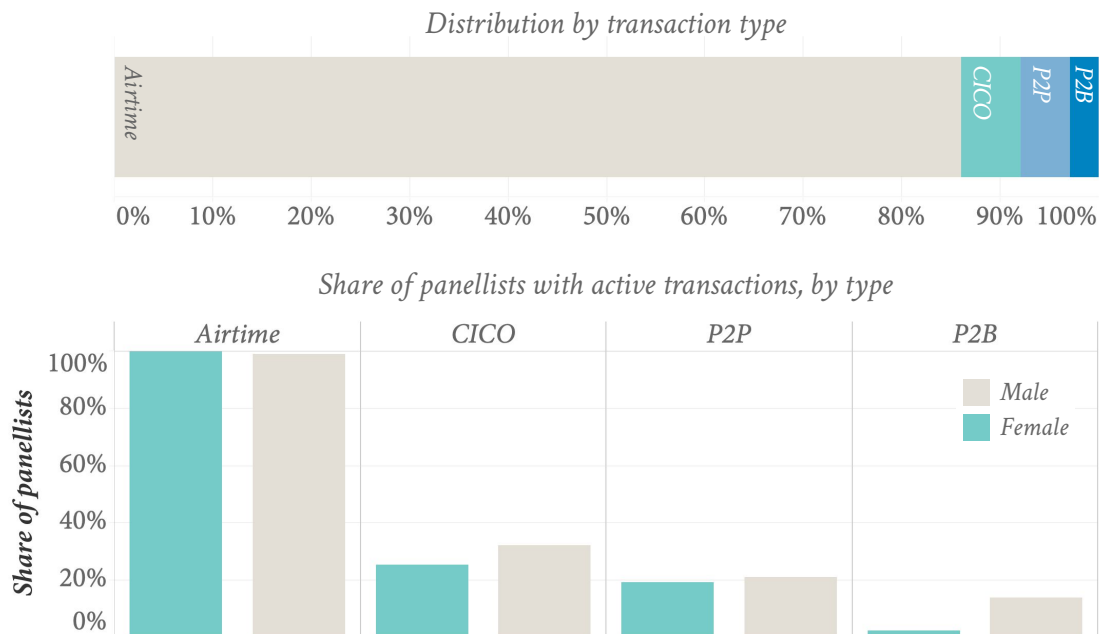
While Bangladesh enjoys a relatively high level of financial inclusion at 47% of adults, only 17% have a registered mobile money account. The rest rely on OTC/ agent transactions to make payment and manage cash. In fact, most (64%) bKash users don't have a registered account.

Because OTC transactions are not visible in our data, we would expect and in fact do see an under-representation of P2P, CICO, and P2B activity that is only being recorded on agents' accounts.

In our panel, both men and women do basic DFS functions (CICO and P2P transactions) almost equally, but men are much more likely than women to do any P2B (merchant payments or bill pay).

Overview of transaction types, frequency, value

Bangladesh, 2019  Caribou Data • insights built on privacy



While growing quickly, the Côte d'Ivoire market is limited in scope of service offerings, and overall usage remains relatively low

Overall economic growth has helped the financial services sector in Côte d'Ivoire grow steadily for the past 8 years, supported by the Financial Sector Development Strategy launched with the World Bank in 2014.

Traditional banks and MFIs continue to serve only a small portion of the population, with just 7% and 3% respectively of the adult population having an account.¹

The gender gap is 11 percentage points, with 47% of men and only 36% of women having any kind of account in their name.²

Mobile money services launched in 2008 with Orange Money, followed later by MTN (2009) and Moov (2013), and have been primarily responsible for increases to financial inclusion, with 38% of adults in 2018 having an active account.³

Part of the increased adoption in mobile money has come from targeted efforts to make bill payments digital; most famously Côte d'Ivoire has shifted 94% of payments for secondary school fees to mobile money.⁴

Despite the increased adoption of mobile money, the range of services beyond CICO and P2P remains limited. MTN and Moov offer a dedicated savings product, but we found no established digital credit/loan products from the operators or third-party OTT fintechs.

While interoperability between mobile money providers doesn't currently exist, Côte d'Ivoire is considered a primary target market for the launch of Mowali by MTN and Orange.⁵

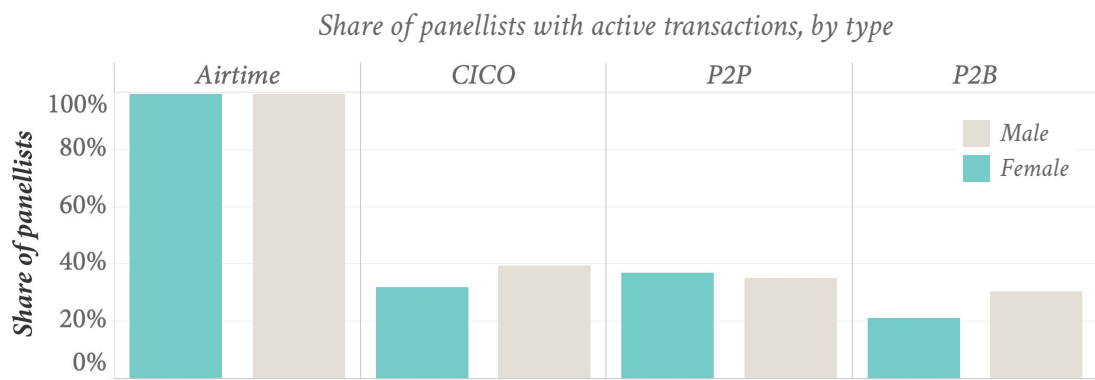
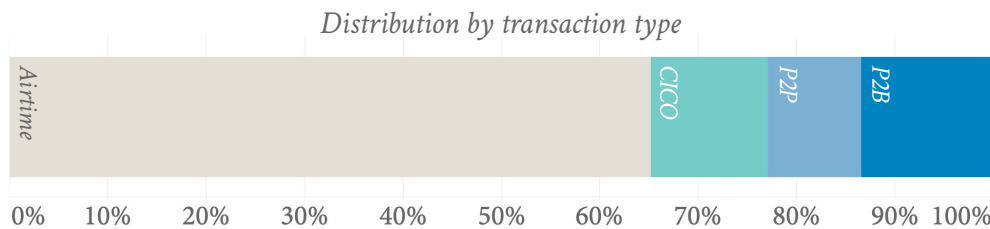
While still an emerging DFS ecosystem, the Côte d'Ivoire market shows a substantial amount of P2B activity, comprising 13% of all transactions

Mobile money activity is growing quickly in Côte d'Ivoire, and is responsible for almost all of the recent gains in financial inclusion.¹

While the basic use cases are most common, concerted efforts by the government to promote person-to-business (P2B) transactions have been successful (for example, an initiative to move payments for secondary school to digital channels has been very successful), and we show 30% of men and 21% of women with at least one P2B transaction.

Overview of transaction types, frequency, value

Côte d'Ivoire, 2019  Caribou Data • insights built on privacy



■ 4 Analysis of L1P Principles

Focus on interoperability, fees,
user experience, and device quality

In this section

We use a series of snapshots from all five markets to explore how the L1P Principles of interoperability, fees, user experience, and device quality influence gendered usage of DFS.

Analysis of L1P Principles

4.1

Interoperability

“DFSPs, including both banks and licensed non-bank transaction account providers, are eligible to be direct participants in the scheme”

We show examples of activity which reflects the benefits of interoperability, including bank transactions in Nigeria and the adoption of integrated products in the M-Pesa ecosystem. We also show behavior that reflects consumers’ coping strategies when systems don’t interoperate or when interop carries high fees, including multi-homing bank accounts in South Africa and Nigeria.

Among customers of GTBank in Nigeria, half of P2P payments were to other GTBank accounts (internal) and half to other banks (inter-bank)

To help understand the demand for interoperable financial services, we explore the frequency and value of inter-bank P2P payments with customers of GTBank in Nigeria.

We compare the ratio of *internal* P2P payments, i.e. those made to other GTBank accounts, vs. *inter-bank* payments made to accounts at other banks, split by gender. Overall, about half of P2P payments are inter-bank transactions (53% for women, 61% for men). Until January 1 2020, all of these transactions carried a flat fee of N52.50; currently there is a tiered fee structure.

Inter-bank payments were also, on average, higher-value transactions, US\$35 vs. \$23 for internal payments. There was no significant gender difference in average payment value.

Internal vs. inter-bank transfers among P2P payments

GTBank Nigeria 2019  Caribou Data • insights built on privacy



Both genders multi-home, with 15% of the Nigerian panel and 20% of South African panel using more than one bank account

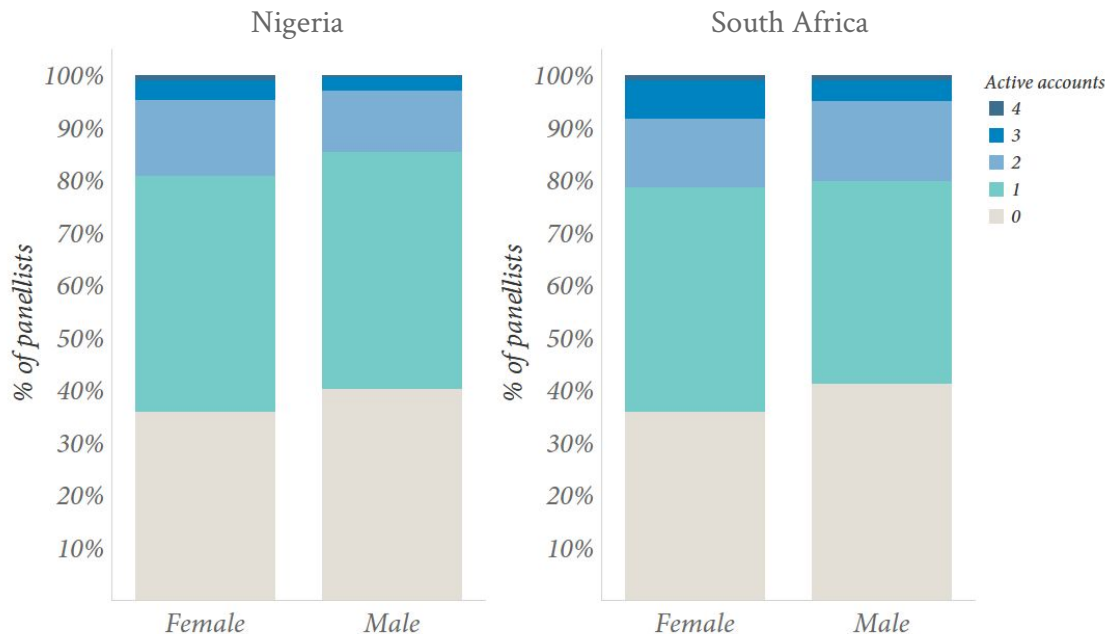
Both Nigeria and South Africa have high rates of financial inclusion based on bank account registration,¹ and it's also relatively common for individuals to have more than one account.

While reasons for this vary, we assume that a significant driver of multiple accounts is fee avoidance behavior.

To start to quantify this behavior, we explore multi-homing of bank accounts, and find 15% of panelists in Nigeria and 20% of those in South Africa had more than one active bank account, i.e., recording a transaction during the study period. Because many bank accounts are inactive or used rarely,² we assume these numbers are likely significantly underestimating the actual rate of multi-homing.

Number of active bank accounts, by gender

Nigeria, South Africa, 2019  Caribou Data • insights built on privacy



[1] 40% and 69%, respectively. Findex, 2017; Finclusion 2017; [2] Deloitte/Mastercard, 2019

The success of Safaricom's Fuliza product shows strong demand from women for expanded scope of mobile money services

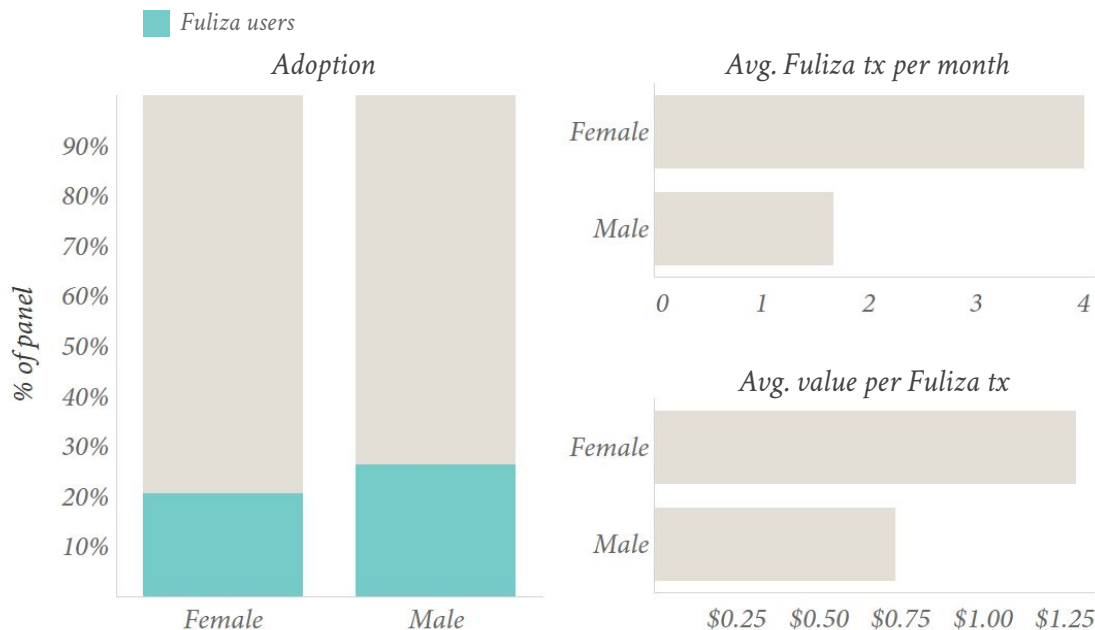
As a semi-automated overdraft facility for M-Pesa transactions, Safaricom's Fuliza provides an easy and low-friction way of accessing short-term credit for M-Pesa subscribers.

While only launched in November of 2018, Fuliza has quickly become common—in our Kenya panel, 21% of women and 26% of men had used it. While fewer women used the service, those who did were more active than their male counterparts: Women averaged 4 transactions at an average value of \$1.28 each, compared to men averaging 1.6 transactions for \$0.73 each.

Women's high utilization of Fuliza suggests that innovative new DFS products—in this case a wallet-integrated credit facility—may be especially valuable in serving unmet needs of women DFS users.

Use of Fuliza overdraft facility, by gender

Kenya, 2019  Caribou Data • insights built on privacy



Integrated savings accounts are very popular in Kenya, with 19% of males and 14% of females using M-Shwari savings accounts

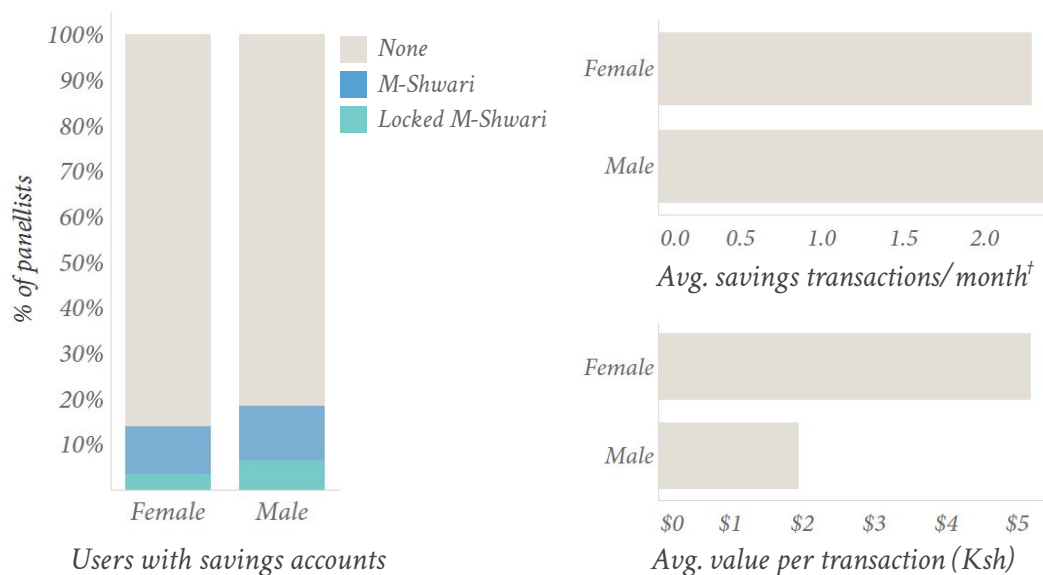
The M-Shwari product is tightly integrated with M-Pesa, enabling simple funds transfer and widespread adoption of digital savings accounts, with men (19%) slightly outpacing women (14%).

Panellists of both genders averaged almost 2.5 savings-related transactions per month, but women had a median value more than twice as high as men (\$5 vs. \$2).

In interviews from the Kenyan field research, women were more likely to describe value in locked accounts, which were seen as mechanisms to prevent unwanted appropriation of their savings (e.g., from a family member). But the data show men as more active users of locked accounts. Note that all data shown represent savings activity only (no M-Shwari loans).

Usage of savings accounts, by gender

Kenya, 2019  Caribou Data • insights built on privacy



[†] Movement of funds in/out of the savings account, not just deposits

In Bangladesh, third-party top-up services comprise 25% of all top-ups, and are used twice as much by men as they are by women

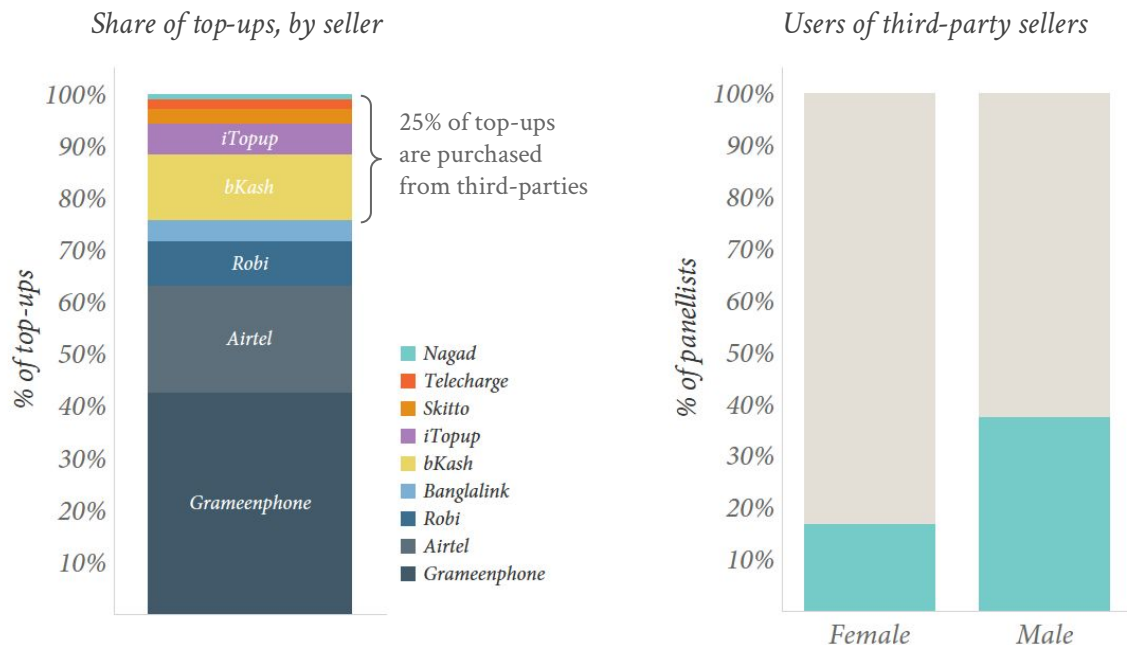
Third-party vendors of airtime and data top-ups such as Telecharge and iTopup are commonly used in Bangladesh. In our panel, 25% of top-up purchases were made through a third-party, and 75% directly from the mobile operator.

Looking at the demographics of those users, we find men are twice as likely as women to use third-party services, 37% vs. 17%.

We can't know for certain the reason behind this strong gender skew, but it suggests that men are more comfortable managing multiple financial service providers, or more comfortable buying from lesser-known companies.

Purchasing top-ups from third-party sellers

Bangladesh, 2019  Caribou Data • insights built on privacy



Adoption of P2B (merchant/bill pay) service varies widely by country, and in almost all cases men are more likely and more frequent P2B users

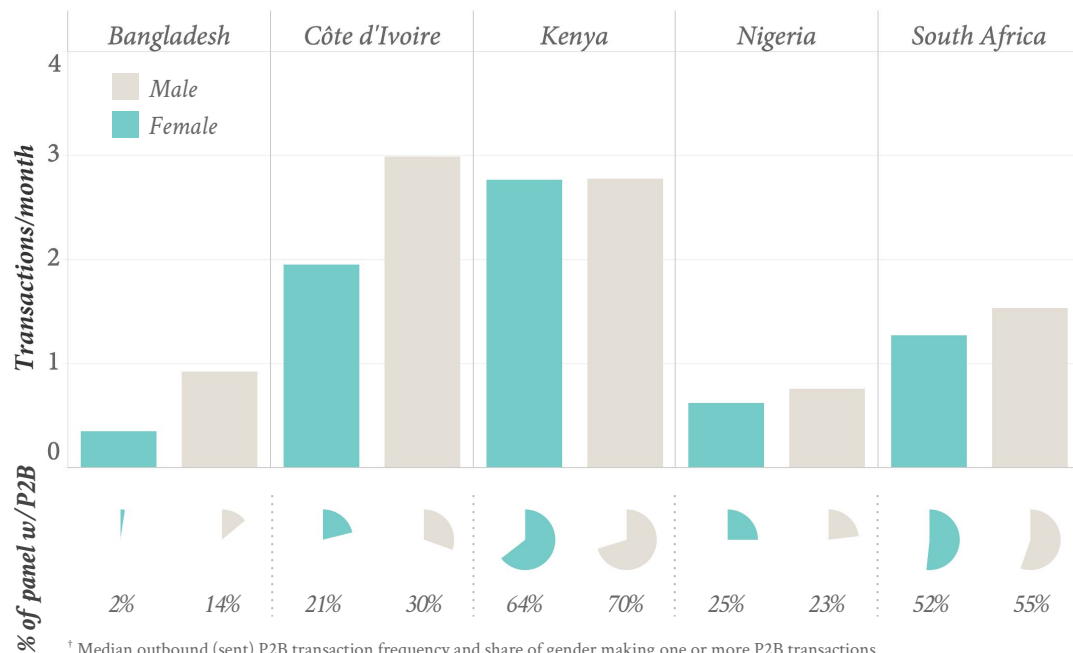
Typically seen as an advanced DFS use case, P2B (merchant payments/POS and bill pay) adoption varies from a high of 70% of males in Kenya to a low of 2% of women in Bangladesh.

The gender split for adoption is more pronounced in the less-mature markets, with only 2% of women vs. 14% of men in Bangladesh, and 21% of women vs. 30% of men in Côte d'Ivoire.

Usage frequency mostly mirrors adoption, with Kenya the established leader at almost 3 P2B transactions per month for both genders, while Côte d'Ivoire is an outlier with high frequency of P2B transactions despite only about ¼ of the panel having any transaction at all. South Africa panellists show a relatively low frequency of P2B, though this is likely due to many of those transactions being done online via a computer.

Average number of P2B transactions per month[†]

All markets, 2019  Caribou Data • insights built on privacy



Analysis of L1P Principles

4.2

Fees

“Fees to end users (individuals, merchants, etc.) should be zero or low, and may vary by use case”

Because high fees deter usage, especially among marginalized populations, we use examples from Kenya and Côte d'Ivoire to assess the current state of fees borne by each gender. We also show clear examples of fee avoidance behavior in P2P transactions as well as airtime advances.

Looking at aggregate payment values across markets shows where fee tiers distort transaction behavior

Analyzing aggregate payment values can reveal the impact of different fee structures.

In Kenya, the transactional data clearly show the effect of the M-Pesa threshold of Ksh100 (\$0.98), which results in many P2P transactions being modified to fit under that amount (e.g., multiple smaller transactions <100).

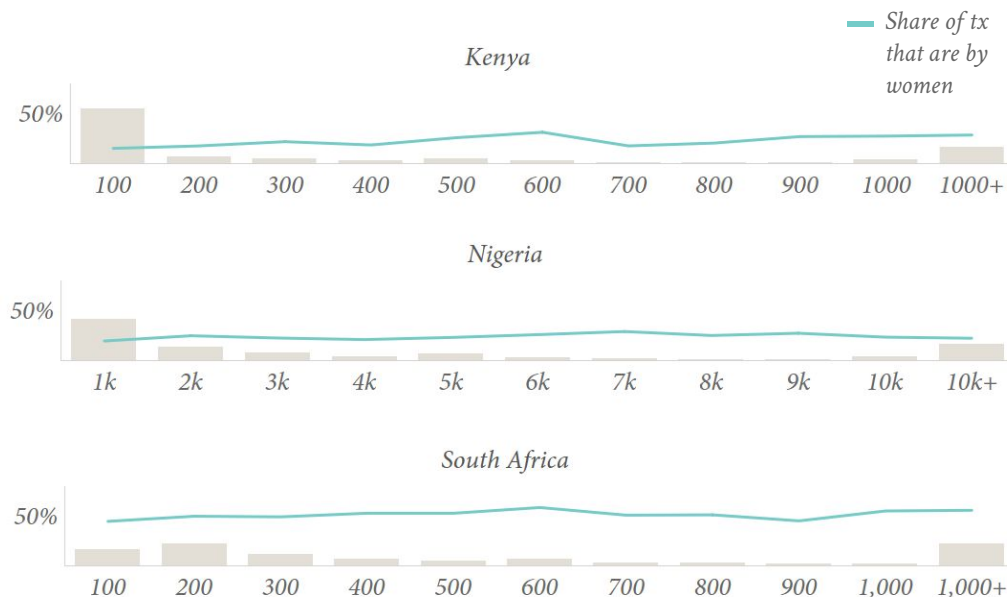
In South Africa, there is only a very slight skew toward lower-value transactions, likely attributable to the flat fee structure for inter-bank transfers and an overall higher level of economic wealth.

Nigeria shows a modest bump in lower-value transactions, primarily P2P bank transfers. Even though it historically had a flat fee structure, on January 1, 2020 it adopted tiered pricing for transfers.

In general, we see no clear evidence that women are more likely to make smaller-value transactions—their share is relatively flat.

Value of transactions, excluding top-ups

2019  Caribou Data • insights built on privacy



Women in Kenya pay more on average per P2P transaction, leading to them paying higher total fees per month

In our Kenya panel we see a strong gender bias in average fees paid, with women paying about \$0.10 per P2P transaction sent, vs. \$0.07 for men. This leads to higher average total fees paid per month, about \$0.28/month for women and \$0.16/month for men.

Given that about 25% of all P2P transactions in Kenya completely avoid fees by keeping below the Ksh100 fee threshold, a median fee of \$0.10 per transaction represents a relatively significant cost for sending payments.

For this analysis we focus only on P2P payments, as those transactions are the most common and offer the cleanest fee structures for more comparable data across DFS providers.

Fees paid for P2P transactions in Kenya

Kenya 2019  Caribou Data • insights built on privacy



In Côte d'Ivoire, airtime advances are very popular with both genders, though women more commonly take advances below the fee threshold

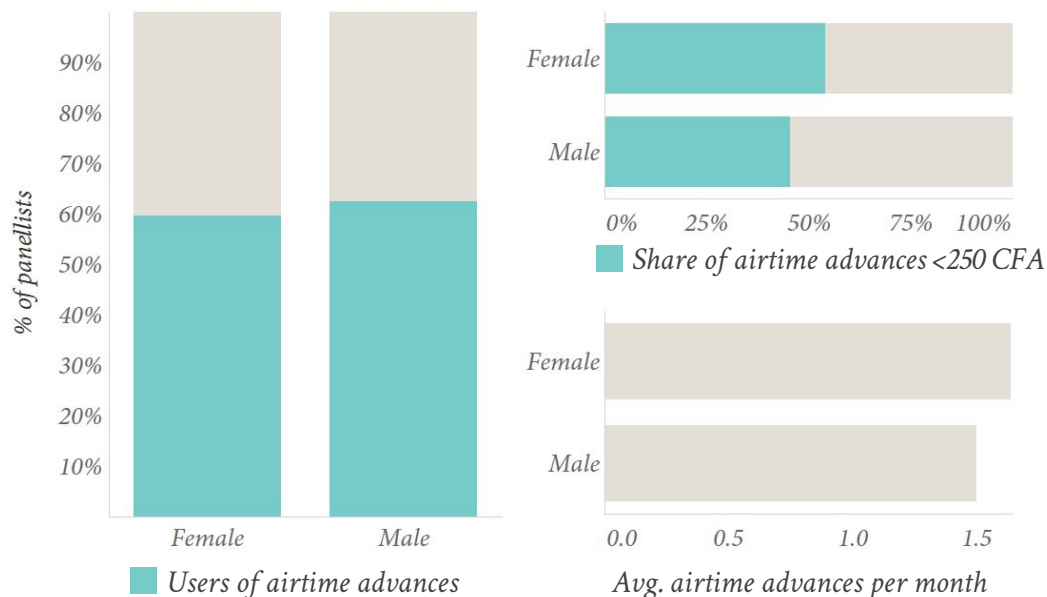
While not true “loans,” airtime advances have quickly become a common tool for income smoothing, and are seen as an on-ramp to providing additional DFS services.¹ About 60% of women and 62% of men in our panel used airtime advances, the vast majority of them Orange’s “SOS Credit” product.

Users of this product pay 13% in fees (10% commission and 3% taxes), although amounts of 250 CFA and less are fee-free if repaid in 3 days. Women are more likely to stay below this fee threshold, with 54% of their advances 250 CFA or less, compared to 45% for men.

This supports findings from the field work, where women were much more likely to express discomfort with taking advances of large amounts.

Use of airtime advances, by gender

Côte d'Ivoire, 2019  Caribou Data • insights built on privacy



In South Africa, Capitec Bank customers average less than \$3/month in fees, with men paying more (\$3.02) than women (\$2.25)

As a DFS provider in South Africa with a clearly communicated fee structure, and over 300 panelists as customers, Capitec Bank provides a useful case to examine fees borne by each gender.

In this case we see men paying slightly more per month in fees, \$3.02 vs. \$2.25 for women, even though women make slightly more transactions per month (3.0 vs. 2.7).

Because fees are reported inclusive of transaction fees, card fees, balance enquiries, etc., we hypothesize that the higher amount of fees borne by men is not due to inter-bank payments, but more likely card fees and other maintenance charges.

Fees paid by Capitec customers

South Africa, 2019  Caribou Data • insights built on privacy



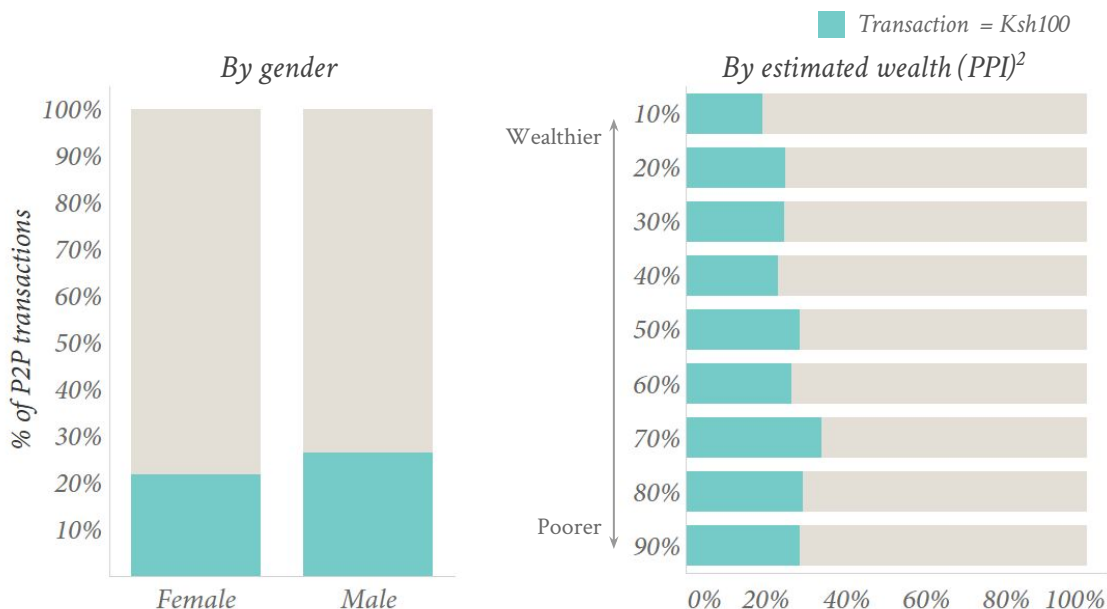
In Kenya, both genders avoid fees by sending P2P payments below the fee threshold (Ksh100); this behavior spans income/wealth status

Drilling down into the lowest value payments in Kenya, we can see that both genders make a large number of P2P payments at the Ksh100 threshold for free transactions.¹ While we can't attribute all of these transactions to fee-avoidance behavior, based on responses from the interviews and focus groups we can hypothesize that many of them are.

In our panel, men had a slightly higher proportion of their P2P payments (27%) at Ksh100 compared to women (22%). Interestingly, we see no substantive difference in this fee avoidance behavior based on income/wealth, as estimated by PPI likelihood.

Share of P2P transactions at max fee threshold of Ksh 100

2019  Caribou Data • insights built on privacy



Recent events reveal significant user response of changing fee structures for P2P payments

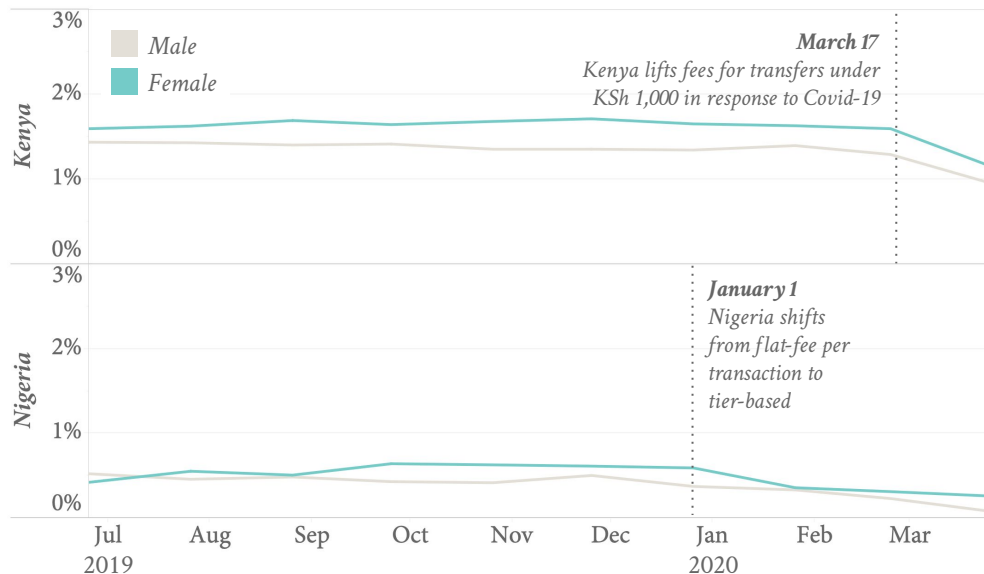
In Kenya, Safaricom's dominant market position has allowed it to maintain relatively high fees, starting at Ksh 10 (\$0.10) for transactions of >Ksh 100. As a result our panellists pay an average of about 1.5% of P2P transaction value in fees, with women averaging a significantly higher fee burden over men during the study period.

This changed when Safaricom raised the fee threshold from Ksh 100 to Ksh 1,000 in response to COVID-19.¹ The result was a predictable spike in P2P payments of higher values and lowering of average fees paid to about 1% of transaction value.

In Nigeria, inter-bank P2P transfers carried a flat fee of N52.50 (\$0.13), leading to an average fee ratio of only 0.4%. On 1 January 2020, the CBN instituted a tiered fee structure² that lowered the average fees paid to only 0.2% of transaction value.

Fees paid per P2P value transacted

Kenya/Nigeria, 2019–20  Caribou Data • insights built on privacy



Analysis of L1P Principles

4.3

User experience

“The user interface is simple and intuitive for a consumer; the user interface is designed to prevent user errors and fraudulent activity”

We show that across all markets, people who use apps to transact are more intensive DFS users, yet the vast majority of transactions still occur over USSD/STK, even on smartphones. This may be less about the UI of apps per se and more to do with the data costs (perceived and real) of OTT app usage.

Apps are still a niche use case—across all markets, USSD/ SIM menu transactions remain the dominant channel, even for smartphone users

While the long-promised smartphone era is no doubt arriving, the current mobile financial services landscape is still dominated by USSD/ SIM menu transactions.

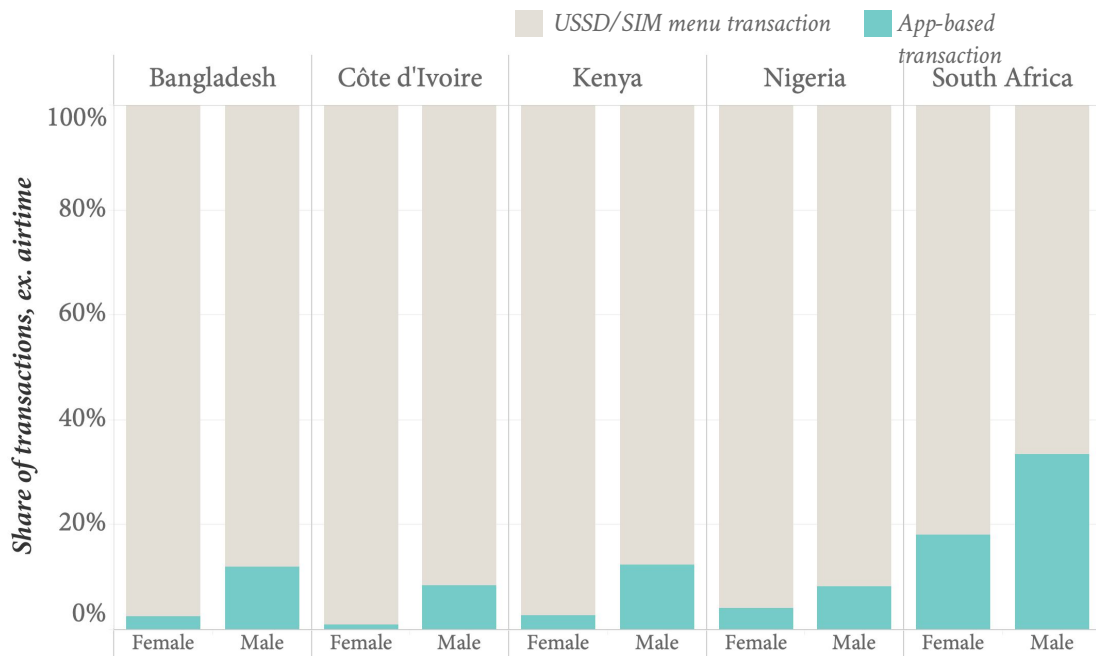
Across all five markets in the study, app-based transactions accounted for only 13% of the total—despite the fact that all panels are comprised solely of smartphone users.

App use varies by country, with South Africa leading due to commonly used banking apps, while Bangladesh scores highly due in part to the dominance of bKash, which as an OTT player sees a lot of its activity via its app.

Most importantly, there are strong gender biases in app usage, with every country showing a heavy skew toward male use of apps for financial services.

Apps vs. USSD/SIM menu for making financial transactions

2019  Caribou Data • insights built on privacy



Across all markets, use of financial apps correlates positively with more frequent *and* higher value transactions

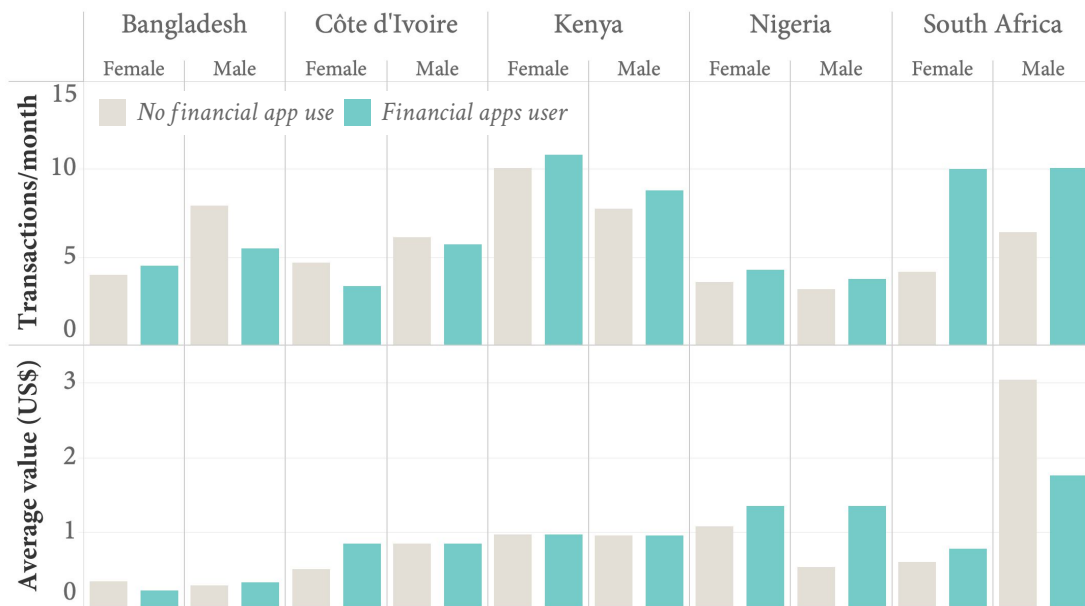
Across all markets, the use of financial apps (mobile banking, fintech wallets, etc.¹) correlates positively with an increase in number of transactions, as well as median value of transactions, compared to those who rely on USSD/SIM menu to conduct payments. This effect is even more pronounced for women.

As the most mature market in the data set, Kenya shows consistency in the value transacted regardless of method, but app users consistently transact more often.

Where an increase in number of transactions is not observed (Bangladesh/Male and Côte d'Ivoire), an increase in median *value* per transaction is still apparent.

Transactional intensity, by financial app use

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Analysis of L1P Principles

4.4

Device quality

“All primary functions should be accessible to users with inexpensive basic/feature phones”

Across all markets, women are more likely to own lower-quality devices, an additional barrier to easily use apps. We also show that individuals with higher-quality devices make higher-value transactions and do them more frequently.

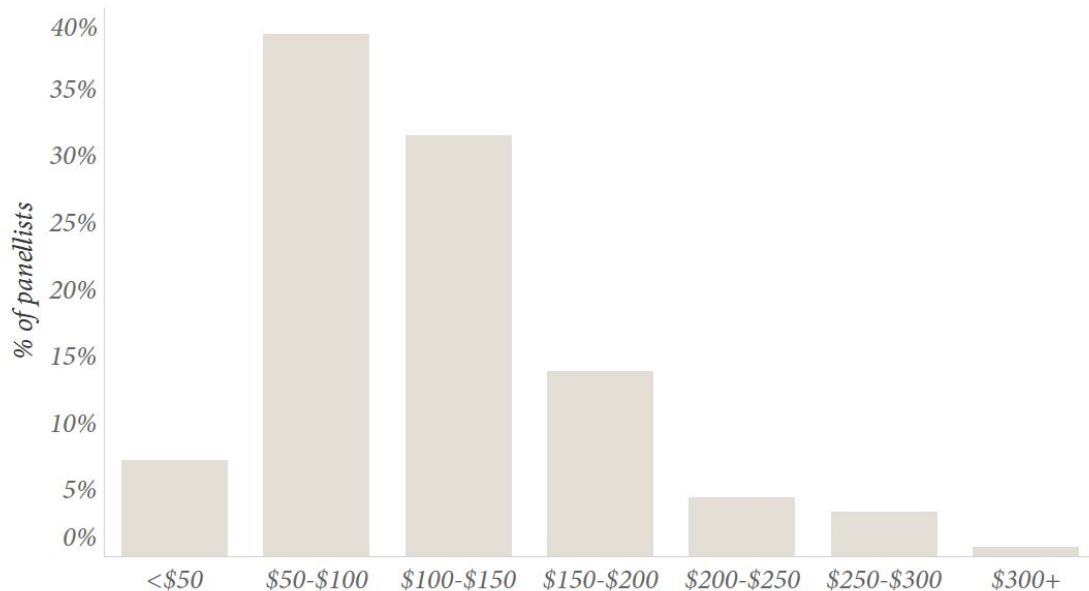
Most devices (54%) in the panel have retail values below \$100, while only 8% of devices are \$200 and up

Most panelists (54%) are using lower-end smartphones costing less than \$100, and almost all (92%) are using devices costing less than \$200.

These prices are likely overestimating the amount that panellists actually paid for the device, as they are current published retail prices for new handsets (sourced from local retail outlets) and we assume many panellists are buying handsets second-hand.

Device cost (published retail pricing)

All markets 2019  Caribou Data • insights built on privacy



Owners of high-end (>\$200) devices made significantly more transactions per month, for higher total value

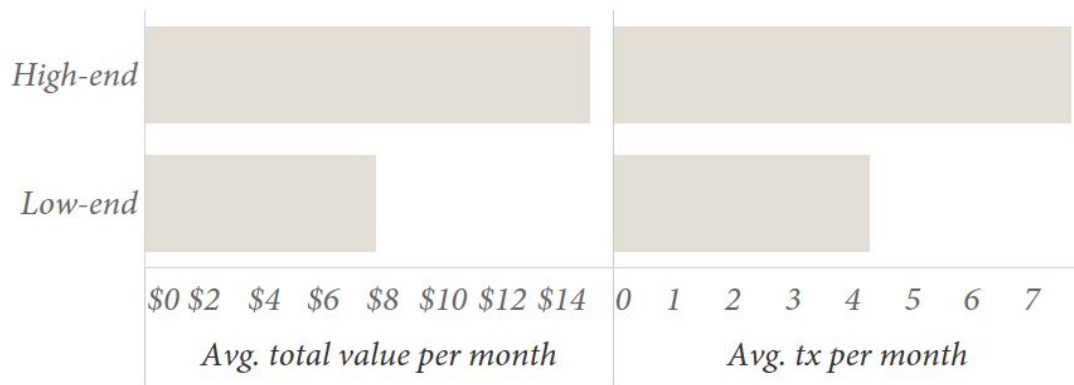
Unsurprisingly those panellists who can afford more expensive mobile phones transacted more frequently and for an average higher total value.

Across all five markets, those with higher-end phones (defined as >\$200 retail pricing) had a total median value of \$15 per month vs. \$8 per month for lower-end device owners.

They also transacted more frequently, at more than 7 transactions per month vs. 4 for all others.

Transactional activity, by device quality

All markets 2019  Caribou Data • insights built on privacy



Women are more likely to own lower-cost devices, an additional barrier to using apps and more sophisticated financial services...

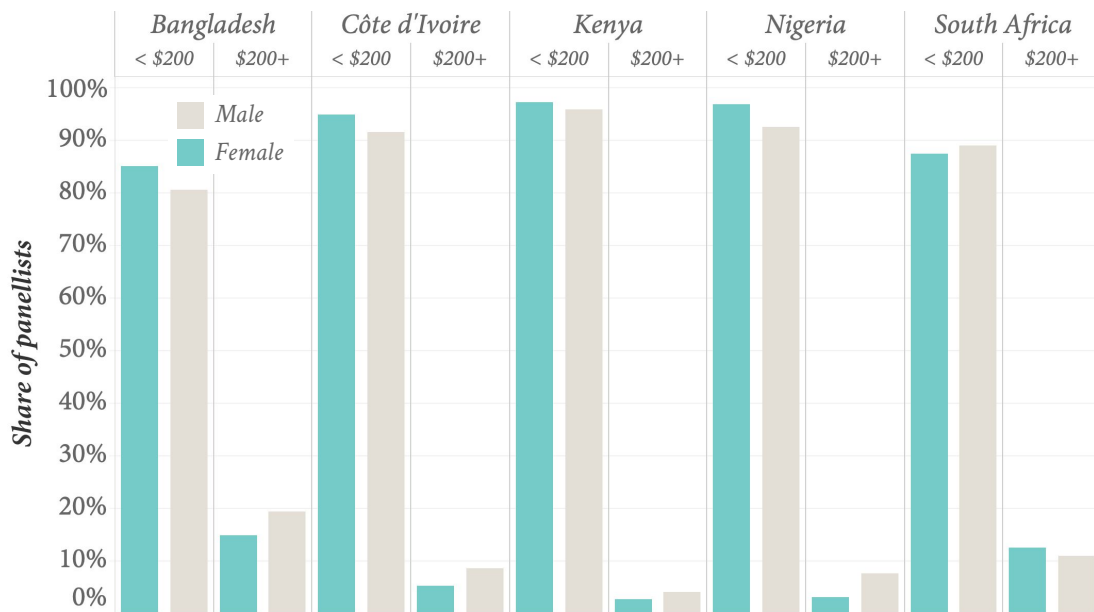
The cost of a mobile device is a good proxy for both the financial resources of the individual and the technical capabilities of the device. This analysis shows the distribution of ownership for top handset models (using current retail pricing), across our panels and gender.

In general, women are more likely to use lower-cost and performing mobile phones, which serves as yet one more barrier to effective use of financial services. Lower-cost devices typically struggle to run multiple apps simultaneously, and often have insufficient free space to keep many apps installed.

Unsurprisingly, women take a greater share of devices at the \$200 price point and below (59% across all panels), while \$200+ devices are more likely to be owned by men.¹

Mobile handset price distribution

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...and a higher-cost device correlates with more frequent app usage, more transactions—and more so among men

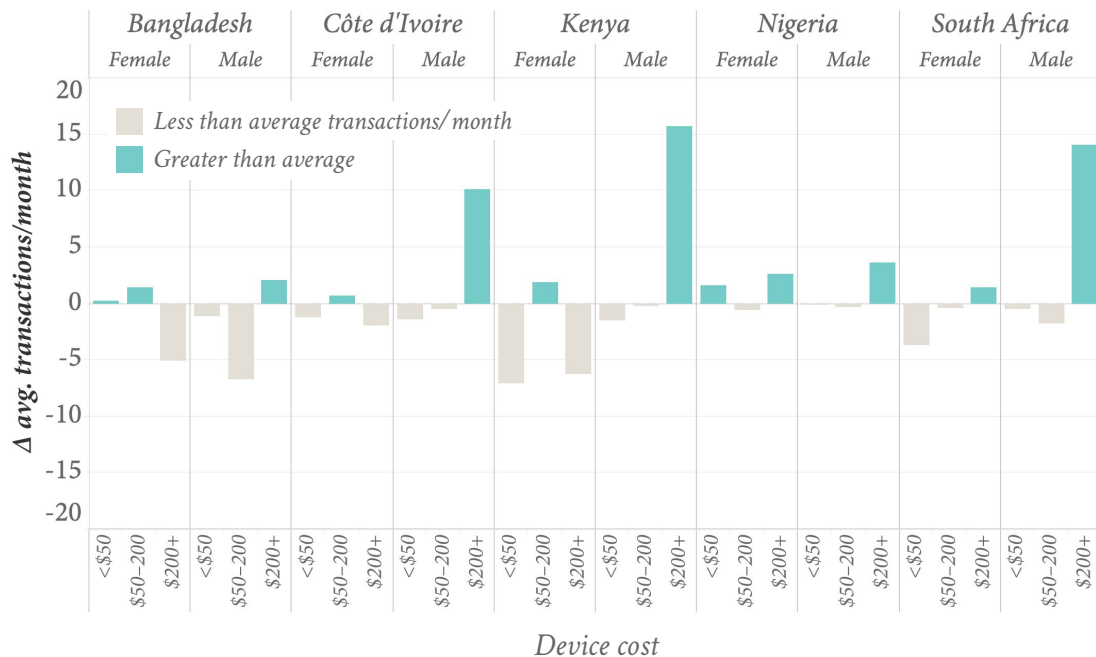
Following on from the gender distribution of handset cost, we further see that a higher-cost device correlates with a higher likelihood of transacting. This analysis shows the difference between the overall country and gender average of transactions per month, and that of each device price point.

While men consistently show a positive increase in transactions/month at the \$200+ point, the data for women only reflects the same trend in South Africa, owing to the higher share of ownership by women at this price point compared to the other markets.

Outside of South Africa, we see either: women making more transactions at the <\$50 point; or the bulk of transactions distributed across mid-price points—both a result of the prevalence of USSD, and lower share of app usage.

Handset price vs transaction frequency

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5 Digital profiles of DFS users

In this section

We create a simple segmentation of DFS users based on the type and frequency of financial activity, cut by gender, to provide original insights into their digital profiles.

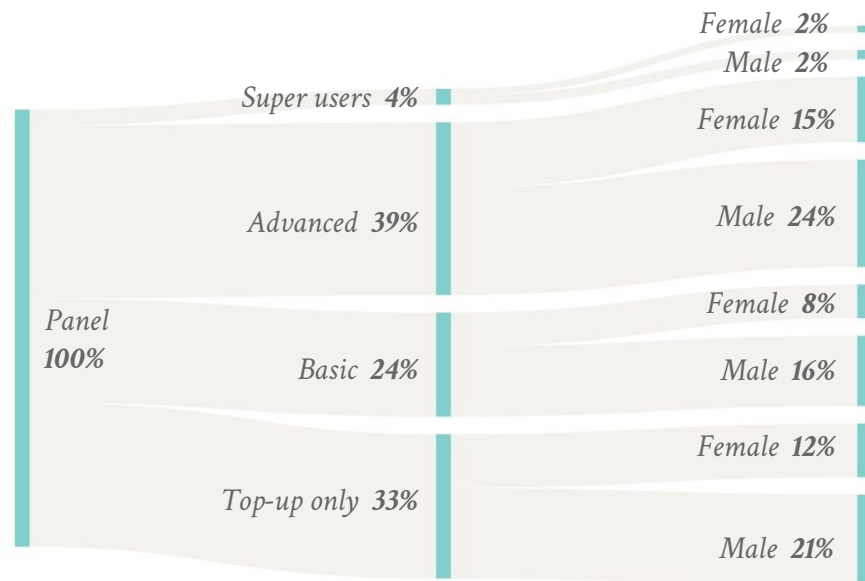
A basic user segmentation by transaction activity and gender provides insight into characteristics associated with advanced DFS use

Categorizing DFS users into segments allows us to compare activity and behavioral characteristics on key dimensions of interest. In this case we use type and frequency of DFS use to segment active panellists into four segments: *Airtime/top-up only*, *Basic*, *Advanced*, and *Super user*. Then each segment is split by gender for eight final segments.

We break out *Top-up only* users separately because in many contexts these transactions are categorically distinct from DFS payments. For *Basic* vs. *Advanced*, we follow the approach of Intermedia¹ and others by categorizing P2P and CICO as *Basic*, and P2B (merchant payments, bill pay), loans, savings, and insurance as *Advanced*. Then finally we break out *Super users* as those who have more than 100 transactions per month of any type; many of these we assume are informal commercial users, though of course this distinction is rarely a clear bright line.

User segments, across all markets

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Differences between the segments become apparent looking at median frequency and value of transactional activity

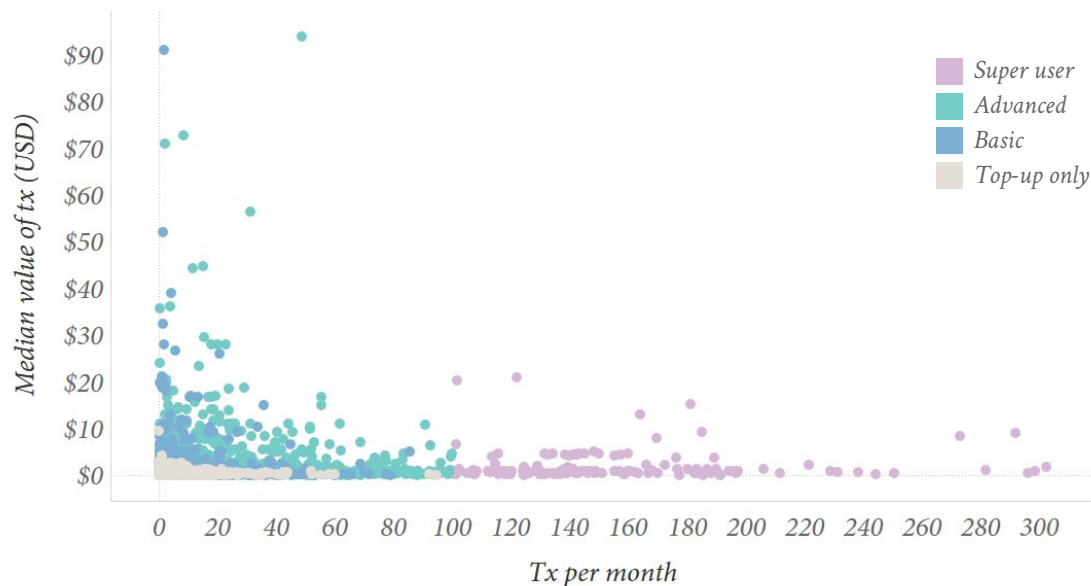
Looking at median frequency and value of transactions across all markets reveals the broad shape of our user segments:

Top-up only users have the fewest transactions, for by far the lowest values. The *Basic* and *Advanced* segments have relatively similar profiles in terms of median frequency and value of transactions, except that *Advanced* users tend to rank higher on both axes.

The *Super user* segment is clearly visible in the scatter chart, representing the long tail of high-frequency users with >100 transactions per month.

Average tx frequency and value*

All markets, 2019  Caribou Data • insights built on privacy



* Airtime top-ups are excluded from calculations except for segment "Top-up only"

Higher-intensity DFS use is best measured by *frequency*, not *value*, of transactions

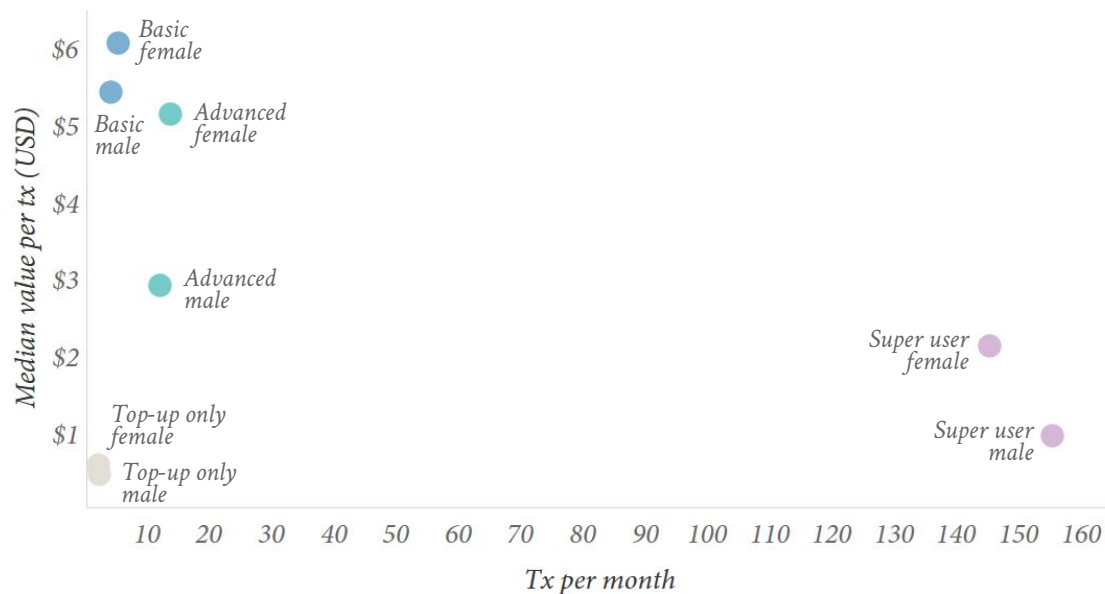
Visualizing aggregate activity per segment, along those same dimensions of median frequency and median value, shows a strong pattern of increasing intensity of DFS usage—from Basic to Advanced to Super user—leading to more frequent, but lower-value transactions.

We hypothesize that with more frequent and advanced DFS usage, consumers are more likely to make day-to-day transactions, especially merchant payments, which brings down their average value, compared to basic users, who may only make one payment a month sending a relatively large sum to family members.

Interestingly, in each of our segments women showed higher median transaction values, with about the same transaction frequency as men, though this varied by country.

Average tx frequency and value, by user segments*

All markets, 2019  Caribou Data • insights built on privacy



* Airtime top-ups are excluded from calculations except for segment “Top-up only”

This pattern holds true across each market except South Africa, where *Super users* have both the highest frequency and median value

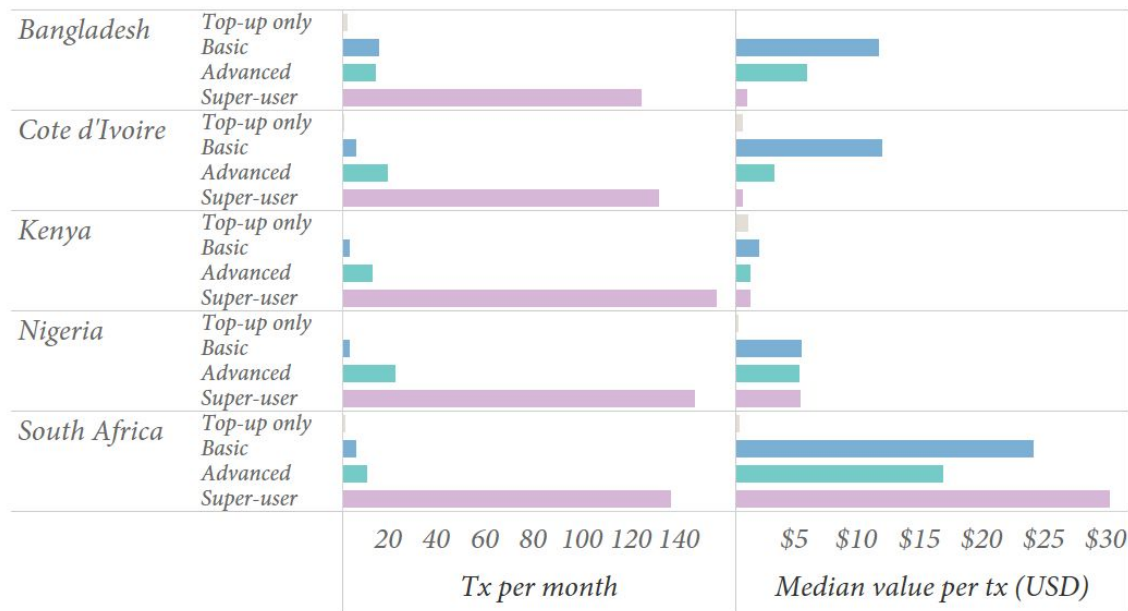
At individual country level, we see some variance in the average activity, but the correlation between increasing frequency and lower value transactions holds across all markets except for South Africa, where the *Super user* segment has both the highest frequency and the highest median value of transactions.

Bangladesh and Côte d'Ivoire have the strongest correlations, while Kenya and Nigeria have relatively balanced median values. Those values in Kenya are low due to the KSh 100 fee threshold on M-Pesa P2P payments.

South Africa has higher value transactions across the board due to its higher per capita income.

Segment transaction value and frequency, by market

All markets 2019  Caribou Data • insights built on privacy



Higher-income panellists were 3x more likely to be *Advanced* users vs. lower-income, but all income levels had *Super* users

The general pattern is higher income leads to higher DFS usage intensity, with 50% of higher-income panellists in the *Advanced* segment vs. 17% of lower-income panellists.

Somewhat surprisingly, the share of *Super users* is relatively constant across all three income segments. In Kenya in particular, the lower-income group had the largest share of *Super users*. This suggests that, in line with anecdotal evidence from the field work, the high volumes of transactions performed by *Super users* is more likely informal commercial activity rather than personal use, and therefore not tied directly to the income/wealth of the individual.

Estimated income/wealth using PPI

All markets 2019  Caribou Data • insights built on privacy

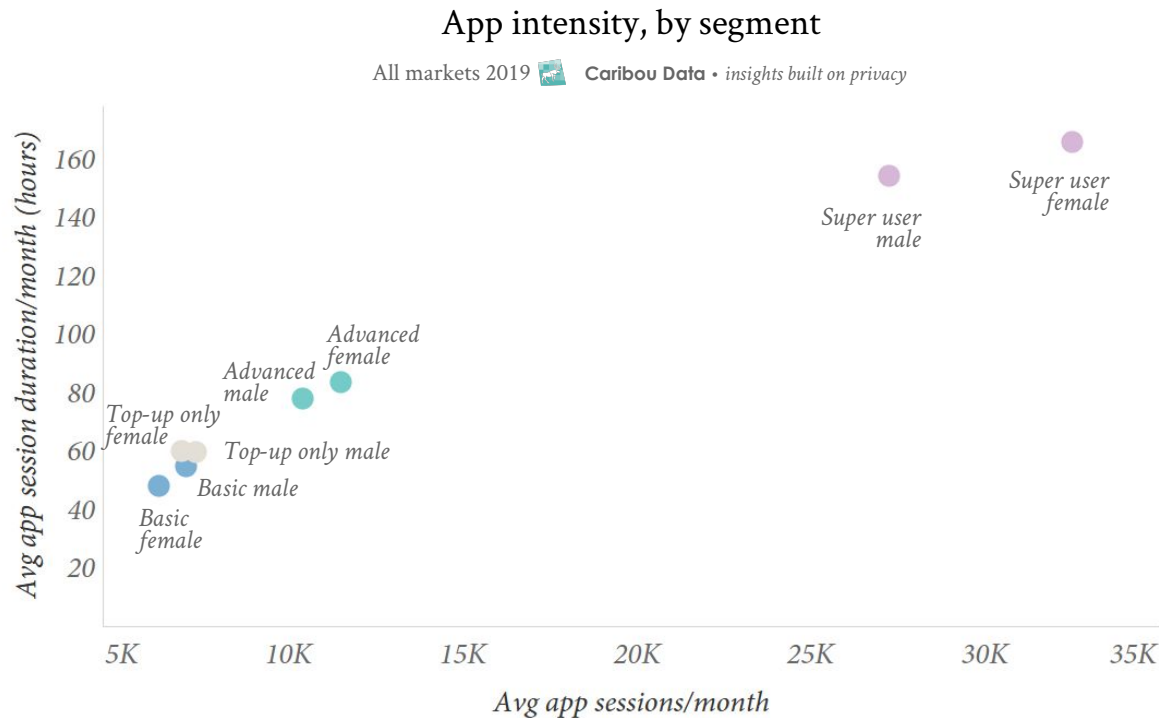


[1] The [Poverty Probability Index](#) uses a set of 10 questions to estimate the likelihood that the survey respondent's household is living below the poverty line. For this analysis we used the \$2.50 line across all markets, and divided panellists into three similar size income groups in order to facilitate the aggregate multi-country view.

More advanced DFS use correlates with higher levels of app use, with *Super users* outpacing all other segments in app intensity

While the links between financial literacy and DFS usage are well-established, fewer studies have focused on the role of digital literacy in enabling DFS use.¹ Intuitively the relationship makes sense, but there is no consensus in the literature on the optimal indicators or proxies for digital literacy.

Our analysis examines app usage across two dimensions (frequency and duration of app sessions) to show a positive correlation between what we call “app intensity” and more advanced DFS use. Across all markets, *Super users* are significantly more intensive users on both dimensions, while *Advanced* users score moderately higher than *Basic* or *Top-up only*.



Advanced DFS users consumer more data, and men in general consume more than women across all segments

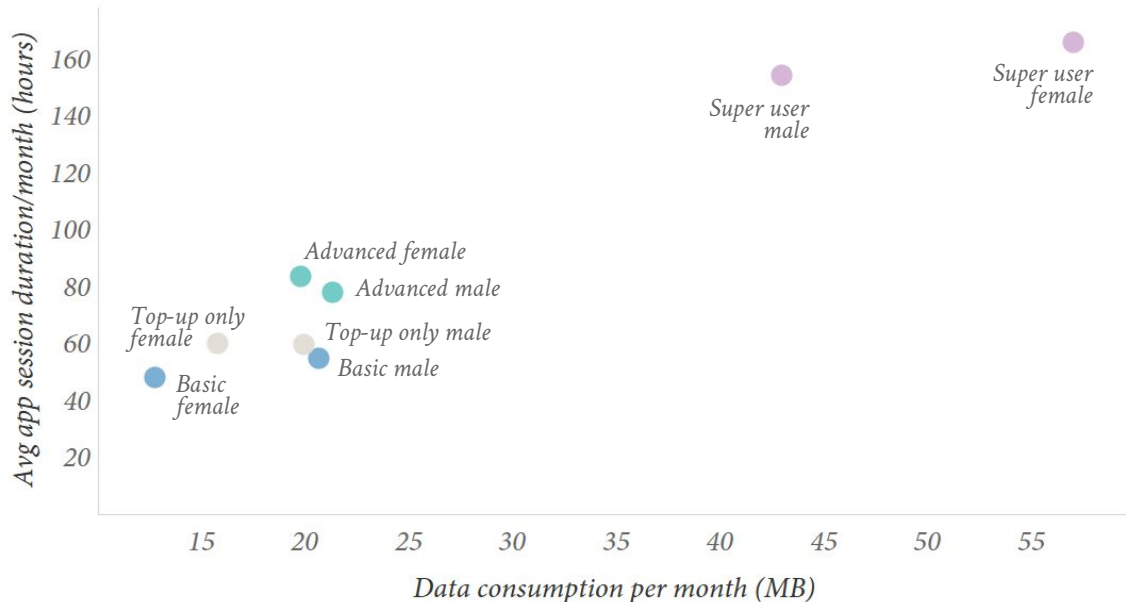
Data consumption unsurprisingly tracks with total app session duration, with higher MBs per month for those spending the most time in apps.

Amongst our segments, *Super users* are also the highest data consumers, likely reflecting higher levels of digital literacy and potentially income as well.

Among the lower-intensity segments, men use more data than women, though among the *Super users*, women consume significantly more data than men.

Data consumption, by segment

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■ Key recommendations

In this section

Learnings and recommendations from analyzing
250,000+ financial transactions across five
markets.

Learnings and recommendations from analyzing 250,000+ financial transactions across five markets

The relationship between DFS and overall digital engagement is strong and should be explored — Our data show strong positive correlations between app usage, data usage, and DFS activity, suggesting that the role of digital literacy in DFS use may be understudied; finding causality in the relationship could help inform adoption strategies.

Standards-based data reporting would improve responsiveness at scale — The diversity of DFSPs and lack of consistent reporting creates tremendous challenges for aggregate analyses across providers and markets. Developing open standards for DFS data could bring tremendous benefits not just to researchers and policymakers, but providers themselves as they can take advantage of improved capacity—internally or external to the firm—to process and operationalize their own data.

Creating behavior-based user profiles by gender can help focus policy and design efforts — Our simple user segmentation helped to illustrate distinctions in both DFS and other digital behaviors across genders, which we believe is a valuable tool for interpreting financial data such that policymakers and service providers can apply it in their work.

Novel research using complementary data and methods holds substantial promise for understanding DFS — Research that combines quantitative and qualitative approaches, such as this study or the i2i study on NIBSS,¹ offer the ability to mitigate the biases of self-reported financial activity, while still revealing insights around causation and perspective that drive behavior.

[1] [*i2i Exploring digital payment use cases through a merged dataset: Nigeria pilot study*](#)

7 Appendices

In this section

Details on panel design, research methods and additional high-level indicators for each of the five markets.

Appendix A

7.1 Methodology

Caribou Data offers a new approach to consumer research, using anonymous data from smartphone users to quantify activity and behavior

Caribou Data provides a privacy-respecting approach to quantifying digital activity and behavior in emerging markets. Unlike surveys, interviews, diaries, and other forms of self-reported data, our panellists share actual activity and behaviors directly from the device, anonymously, providing close to real-time data that avoids reporting and recall biases.

Our basic approach recruits representative panels of 1,000+ smartphone users per market, and compensates each panelist with airtime for every month that they share their mobile data with our service. All data is anonymized on the device, and further protected through differential privacy controls that maintain sufficient aggregation in all analyses.

We analyze data across four categories: devices, networks, apps, and transactions, and typically combine data from multiple categories to develop our analyses:

For **devices**, we can report on make/ model and specifications of the device, which are a very good proxy for wealth/income of the individual. For **networks**, we can analyze, for example, how much time a population segment spends on 2G vs. 3G. For **apps**, we can analyze the frequency and time that a segment spends in social media or messaging apps, or even a specific app. For **transactions**, we can analyze aggregate mobile money activity, such as median value of P2P transactions, or how age relates to CICO frequency.

Panelists are recruited via face-to-face and online channels, and reflect the basic demographic splits of consumers who use the internet

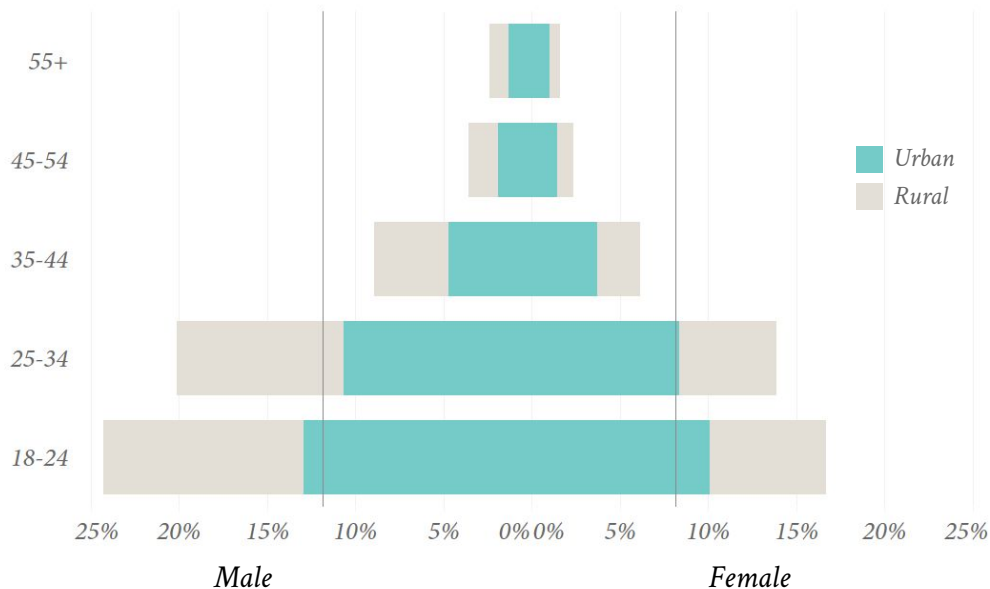
Our sample population in each country is based on 1,000+ adults 18+ with an Android smartphone who at least occasionally use mobile data.

We design the panels first with interlocking quotas for gender, age, and urban/rural locality, derived from the most recent population census or other official sources, and rebased for the 18+ adult population.

We then revise those quotas based on any available household survey data, for example from InterMedia, on smartphone ownership and use of the internet, which typically skews the sample more urban, male, and young. When necessary, we correct for these biases using standard sample weighting techniques.

Example panel: Kenya demographics on age, gender, locality

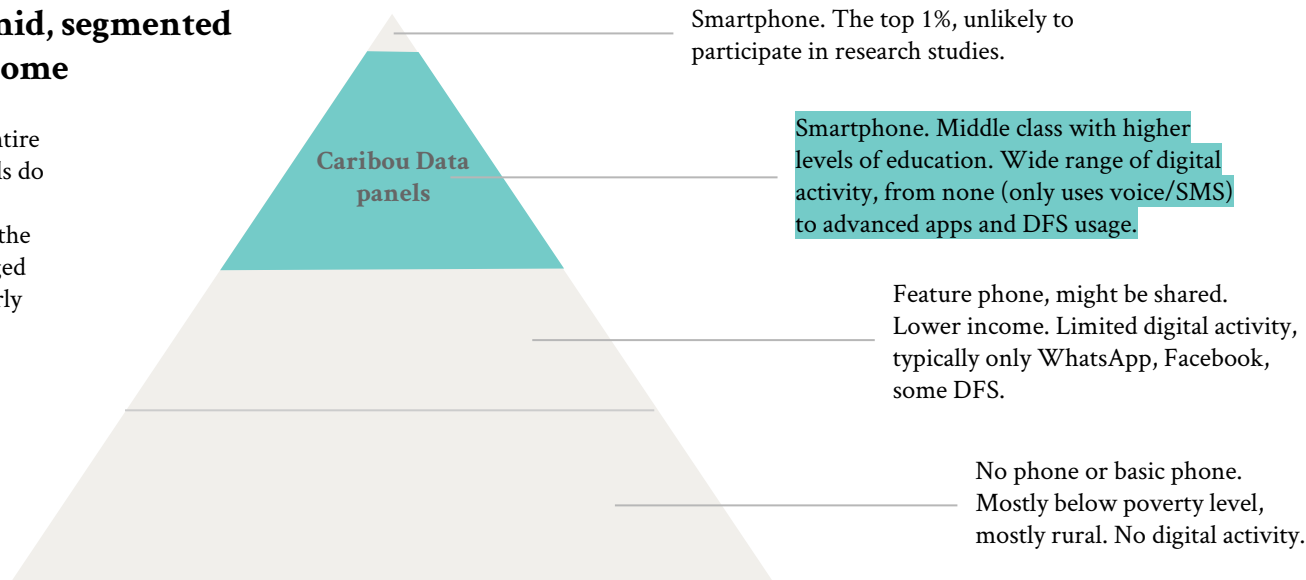
Kenya, 2019 n=1,000  Caribou Data • insights built on privacy



Sampling frame for Caribou Data captures vast majority of digital activity and the inflection point for adoption of new products/services

Stylized population pyramid, segmented on digital activity and income

While we don't strive to represent an entire national population, Caribou Data panels do provide generalizable insights into the "digital consumer class," the segment of the population that is most active and engaged with today's digital products, and the early adopters of future trends.



Diverse and complex DFS ecosystems, plus inconsistent reporting of transactions, creates challenges for cross-market comparisons

Our methodology for identifying and categorizing financial transaction data works very well in mobile-money dominant markets, but less well in diverse markets where traditional banks and OTT fintechs are more prominent. There are a few key reasons for this.

Firstly, because our approach relies on SMS receipts, if the DFS provider doesn't issue SMS receipts (e.g., because they keep all notifications in the mobile app), or the user opts out of receiving receipts (e.g., because they want to reduce SMS messaging volume) the transactions will not appear in our data. We believe this to be an overall very small proportion of transaction volume in most markets.

Secondly, in bank-heavy markets (Nigeria, South Africa) some activity still occurs within the branch, and may be invisible to us. For example, many users rely on ATMs for cash withdrawals, and we typically see these transactions. But few ATMs accept cash deposits, which instead are more likely to take place within the branch and not issue an SMS receipt that we can parse.

Third, many DFSPs use a mix of different receipt formats, some of which correspond to different product channels (e.g., app vs. USSD transaction) but some variance also seems to be result of legacy systems and communications. These inconsistencies in how DFSPs reference their own transactions makes it more difficult to accurately categorize all transactions.

And finally, because of the common practice of using personal accounts, whether mobile money, bank, or fintech wallet, to send and receive business payments, many transactions that we can only see as "P2P" are assuredly for commercial purposes.

Together these constraints make it difficult to ensure complete "apples-to-apples" comparisons of activity, especially across different types of markets. Therefore we encourage comparison within two broad groups: the mobile money-led markets of Kenya, Côte d'Ivoire, and Bangladesh, and the bank-led markets of Nigeria and South Africa.

Appendix B

7.2 Additional market landscape metrics

Women and men in our Nigeria panel showed similar financial activity levels, with almost identical average frequency and value of transactions

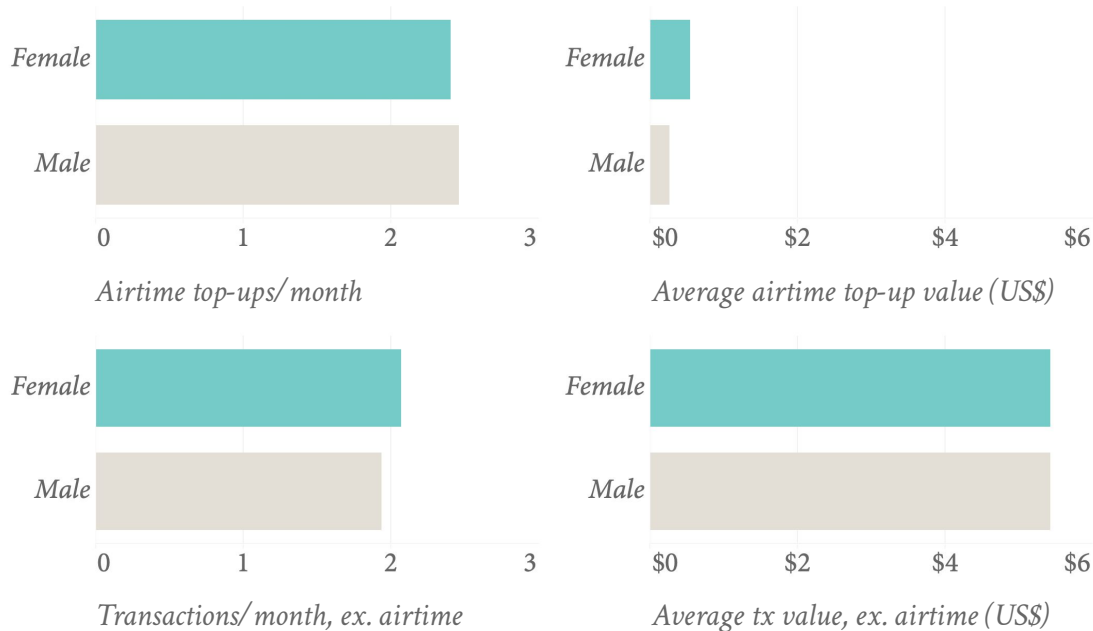
Our Nigeria panel shows a remarkable parity in gendered usage indicators, with women and men relatively even across measurements of median frequency and value.

Both genders perform about 2.5 top-ups per month, for about \$0.31 a top-up. Excluding top-ups, our panelists averaged about 2 transactions (P2P, bill pay, CICO, loans) per month, with a median value of \$5.43 for both genders.

The gender parity in these high-level indicators suggests that the women in our panel may be from higher socioeconomic classes that are more likely to engage with DFS.

Overview of transaction frequency and value

Nigeria, 2019  Caribou Data • insights built on privacy



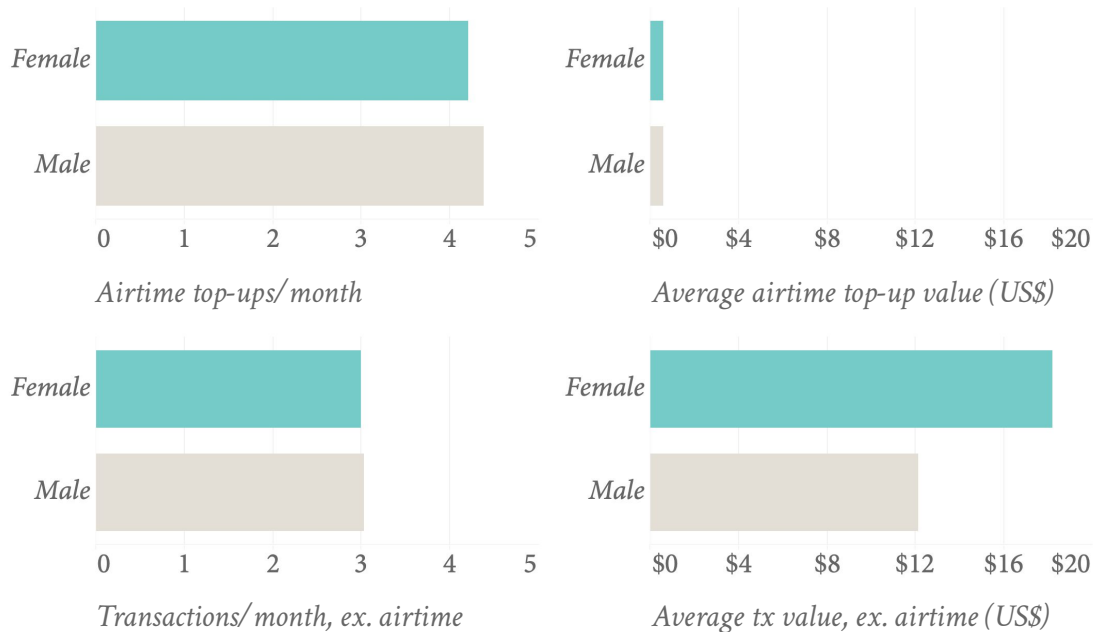
In South Africa, median value per transaction is higher than Nigeria, with women averaging 50% higher median value compared to men

South Africa showed significantly more frequent transactions, for higher values, compared to Nigeria. In our South Africa panel both genders top-up weekly, or a little more than 4× per month, for about \$0.61 per top-up.

Excluding top-ups, South Africans in our panel made 3 transactions per month, averaging \$12 (men) and \$18 (women) per transaction. The large difference in average value is driven by higher P2P payments as well as bill pay transactions.

Overview of transaction frequency and value

South Africa, 2019  Caribou Data • insights built on privacy




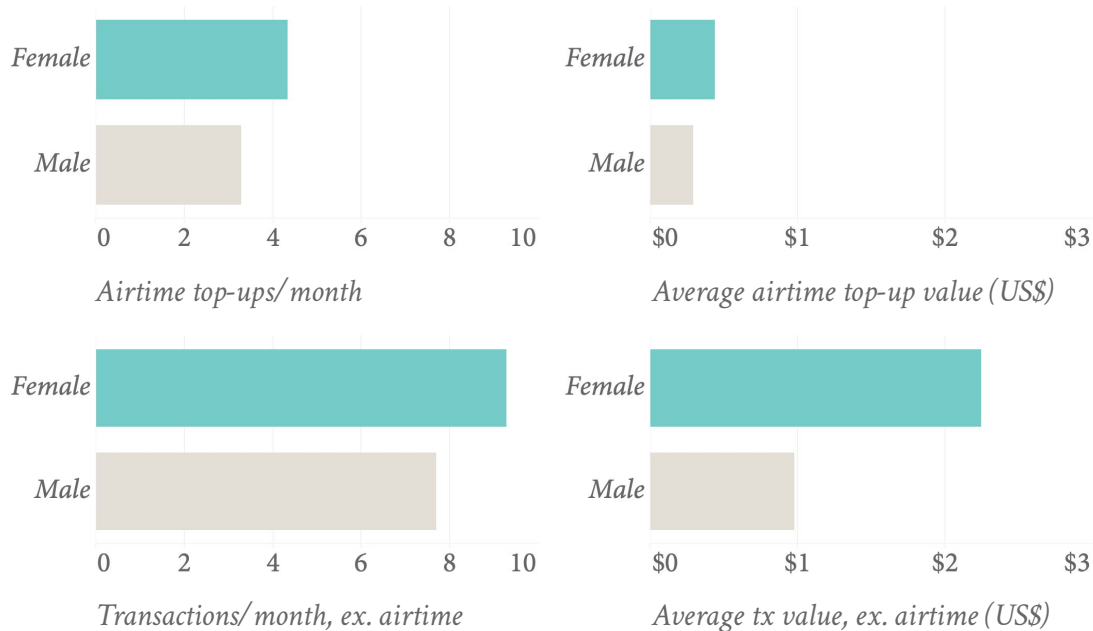
The broad adoption of M-Pesa, especially with merchants, leads to high transaction frequency, while fees push the average value lower

There are two very notable indicators from the Kenya market: First is the low median transaction value, at roughly \$1 for men and double that for women. This low value is primarily due to the fee threshold limit imposed by Safaricom on M-Pesa P2P transactions, where amounts under Ksh100 are free.

Second is the high frequency of non-top-up transactions, averaging about 9 per month across the genders. This high volume reflects the deep penetration of M-Pesa into the economy, especially merchant payments, which comprise 25% of all transactions.

Overview of transaction frequency and value

Kenya, 2019  Caribou Data • insights built on privacy



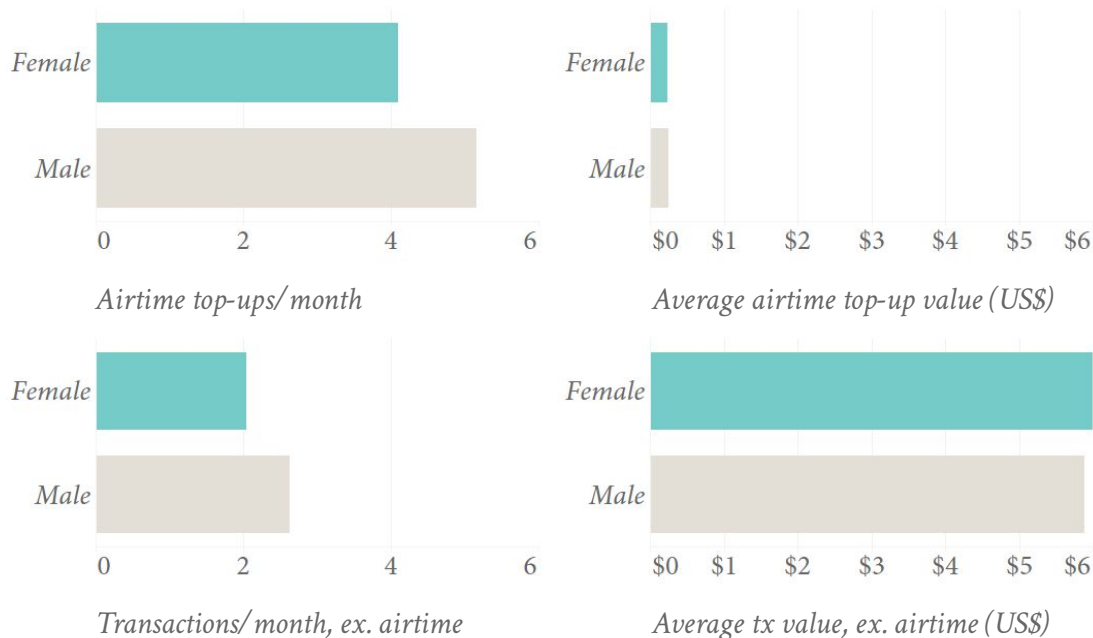
Low frequency of financial activity leads to those transactions being made for higher values

With few places to use digital payments, and a culture of OTC transactions, there is simply less completely digital DFS activity in Bangladesh.

Both genders average only about 2 non-top-up transactions per month, with men slightly higher than women. Given the low frequency, these transactions are, on average, for relatively higher amounts, about \$6.

Overview of transaction frequency and value

Bangladesh, 2019  Caribou Data • insights built on privacy



In our Côte d'Ivoire panel, women make transactions less frequently, but for higher value amounts

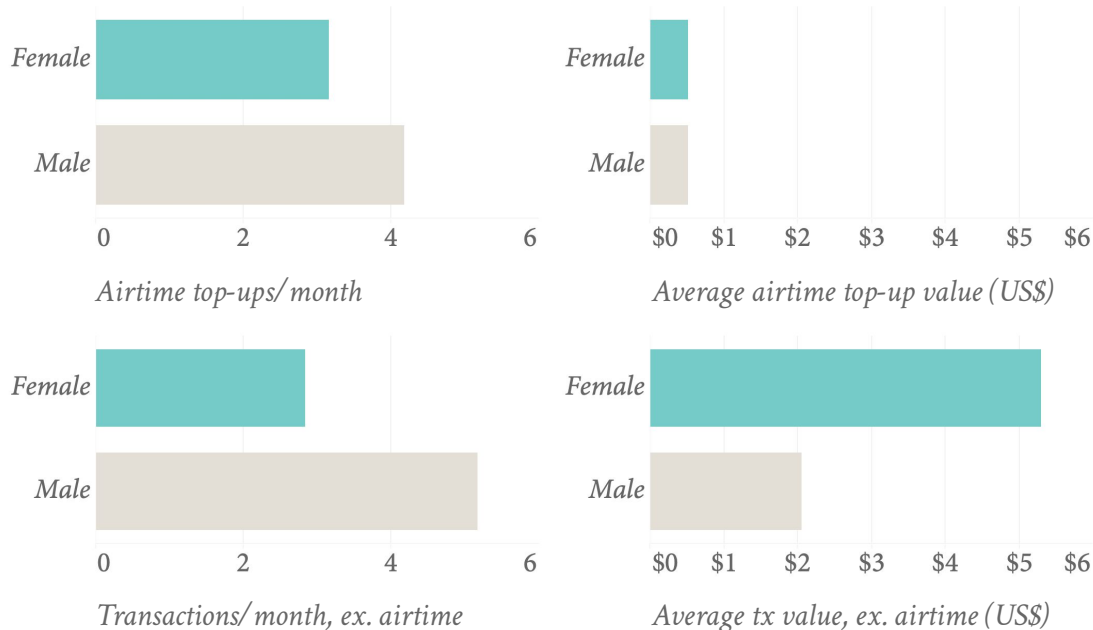
Women in our panel averaged significantly less frequent transactions than men, about 3 per month compared to 5 per month. But the value of those transactions for women was substantively higher, at about \$5 vs. \$2.

The differences come primarily from P2P and CICO transactions, where the median value transaction for women was almost 2x that of men.

While running somewhat counter to our field work findings, these data reflect the higher socioeconomic standing of our panelists.

Overview of transaction frequency and value

Côte d'Ivoire, 2019  Caribou Data • insights built on privacy



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