1. INTRODUCTION

Cash is an expensive financial instrument. Because it is physical, it must physically change hands, be aggregated, moved over space, and protected from theft both in small and large values. All of this – transportation, processing time, security, and the need for physical storage – entails costs. Electronic payment systems represent what could be a dramatic upgrading of the basic infrastructure of commerce. Such systems could slash transaction costs on many different layers of economic activity, potentially yielding major gains for consumers, business owners, and the macro economy at large.

With cutting edge services, like M-PESA and agent banking, Kenya could be poised to make the transition to a “cash-lite” society. But to lay out a roadmap for that transition, we need to understand current payments patterns and how cash actually circulates geographically to identify opportunities to eliminate costs associated with heavier cash usage – notably its collection and movement in bulk, across large geographical distances.

1.1 Background

In November 2011, FSD commissioned Bankable Frontier Associates (BFA) to undertake a scoping study to understand the costs and benefits of a shift towards a cash-lite economy for players at many different layers of the economy: producers, consumers, merchants, service providers, and financial institutions. This scoping study was intended to generate a research agenda for FSD that could effectively support Kenya’s transition to a cash-lite economy and ensure that the benefits of the shift also reach the poorest and most vulnerable segments of society.

1.2 Research questions

1. How does money (cash and e-money) move through a small, fairly contained economy?
   - Where are the concentrations of heavy cash where a shift in payments methods could yield particularly strong benefits?

2. What are the current payment habits of different strata of this community’s economy: producers, consumers, service providers, merchants, and financial institutions and aggregators?
   - What are the benefits and costs associated with these payment methods and habits?
   - What are different actors’ payment preferences, challenges, and fears?

We primarily examined cash mobility and utilization through two analytical lenses. The first lens looked at how cash moved into, out from, and around and between specific geographic areas. In this case, we focused primarily on one rural site in Eastern Kenya, but also supplemented this understanding with research activities in the county hub nearest this environment and a nearby village serving another important market. We looked at flows across these three zones and how they were related to the country’s biggest cities, in this case Nairobi and Mombasa. The second lens looked at the transactional relationships of tiers of economic actors, namely consumers, merchants, and financial service providers. We tried to understand the transactional patterns and preferences of each tier.

Figure 1: The two-lenses approach

2 See figure 1.
1.3 Research methods

We used primarily qualitative methods, with additional breadth gained from a quantitative merchant/service provider census. Overall, we held four focus group discussions in the larger economic hub for the county. The key informants for the main site were the assistant chief and local businessmen/teachers. Furthermore, we conducted a comprehensive transaction point census at the main site, which had an estimated coverage of 95%. Additionally, we conducted 20 in-depth interviews stratified by gender. Lastly, ten in-depth interviews with merchants, eight with financial service providers at the main site and two at the county hub, and 20-30 additional, shorter interviews of smaller vendors and merchants at the main site, nearby market town and county hub were conducted. We also performed a commodity price comparison between the main site and the county hub.

1.4 The core research site

Location: Small town in Eastern Province
Area: About 50 km²
Population: About 8,000
Proximity: About 1 hour driving from county hub
Market day: Saturday
Economy: Cereal production, cattle rearing, small business, traditional medicine
Education: Plentiful and good quality schools (13 total)
Linkages: Fairly strong economic town with a smaller market town 40 minutes away

1.5 Framing the findings

There are two main pathways to reducing the costs of cash. The first is by reducing the need to move large amounts of cash into and out of a geographic area by increasing local recirculation of cash via cash in points that trap cash locally and cash out points that allow users to withdraw that value again wherever it is needed to be used. The second is by increasing the prevalence of direct electronic payments that reduce the use of cash overall. Getting to a broadly inclusive and efficient cash lite economy requires both pathways to be working together.
2 LENS 1 - GEOGRAPHIC COMMUNITIES

2.1 Cash - in movements

We found that cash was entering the community from a wide range of channels and geographic areas, with the most important source of cash being the County Hub, which is home to branches of all the country’s largest banks.

Salaried workers withdraw their salaries in cash from banks and SACCOs in the County Hub, do some big shopping in town, and then return to the community with whatever cash remains. Local employers store funds there and withdraw the funds to pay casual employees in cash on periodic intervals.

Smaller sums of cash enter the community from surrounding small communities. Smaller sub-locations come to this community to do their market day shopping. And, members of this community go to a neighboring community to sell their goats and cows for cash that returns with them physically to this community. This appears to be an important source of cash inflow around the beginning of new school terms, when families liquidate livestock to pay school fees.

However, M-PESA agents are the largest suppliers of cash to the community. They physically transport hundreds of thousands of shillings to the community every week, usually sending an employee by matatu or motorbike to bring cash from County Hub banks to M-PESA outlets every two or three days to accommodate withdrawals.

- Each of 13 M-PESA agents brings about KSh 440,000 in cash per week to accommodate withdrawals*
- KSh 23 million shillings per month
- Often transported via motorbike or matatu with no security; and only very limited concerns about the security of the cash.
- Grain and mango traders pay each farming household about 20,000-100,000 per season in cash in one payment**

Since traders make large payments to several producers or traders on each visit to the community, M-PESA cannot accommodate their withdrawals. They travel with cash from either Nairobi or the County Hub banks and use that cash locally. Those inflows from traders, however, are seasonal.

Figure 5: Core site: Summary of cash entry channels (ranked by magnitude)

- M-PESA brings cash for withdrawals
- Cereal and fruit traders pay producers cash
- Salaried workers withdraw at bank branch and bring cash home
- Schools withdraw cash at bank branch to pay cash salaries for informal workers and teachers
- Shoppers from satellite villages

Figure 4: Overview of cash (not value) movements in from linked geographic zones

- MPESA daily brings cash
- Teachers/salaried workers bring portion of salary in cash from bank/SACCO
- Schools bring cash from bank

1. M-PESA brings cash for withdrawals
2. Cereal and fruit traders pay producers cash
3. Salaried workers withdraw at bank branch and bring cash home
4. Schools withdraw cash at bank branch to pay cash salaries for informal workers and teachers
5. Shoppers from satellite villages

MPESA agents and agricultural product buyers appear to be primary suppliers of large cash inflows

*From interviews with eight local agents.
**From interviews with 20 households. Most sell produce in bulk, except for distress food sales in crisis.
2.2 Cash-out movements

Rather than quickly returning to Nairobi, cash appears to leak out of the community to the County Hub, where local merchants purchase stock and consumers attend to health care needs, shopping, asset purchases, and fuel purchases. In times of cereal shortages (which is several months per year) cash flows out to distant grain producers around the country and on the borders with Uganda and Tanzania. Local suppliers account for 33% of all suppliers to the core site, but only 14% of the value. Larger values of stock (for mostly larger businesses) are purchased from outside the core site. KSh 6.6 million in cash leaks from the county hub through cereal and other stock purchases, but this is only 35% of non-local stock purchases. Most large value non-local stock purchases are already done cashlessly.

Our census of local merchants revealed that even though stock purchases are the biggest source of cash leakage from the community, 65% of the value of non-local stock purchases are already done without cash.

Table 1: Summary of types of purchases

<table>
<thead>
<tr>
<th>Variable</th>
<th>Sum (Entire Site)</th>
<th>Mean (per merchant)</th>
<th>Median (per merchant)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total monthly spending on stock</td>
<td>21,900,000</td>
<td>116,345</td>
<td>12,000</td>
</tr>
<tr>
<td>Total monthly spending purchased in cash</td>
<td>9,589,940</td>
<td>9,000</td>
<td>9,000</td>
</tr>
<tr>
<td>Total stock purchased in cash going outside core site</td>
<td>6,549,180</td>
<td>34,836</td>
<td>0</td>
</tr>
<tr>
<td>Total value of non local stock purchases</td>
<td>18,800,000</td>
<td>99,969</td>
<td>1,000</td>
</tr>
</tbody>
</table>

*Extrapolated from merchant census quantitative data during a period when site was a net buyer of cereals.
Overall, most stock purchases by number are done in cash, but these tend to be lower value. Mobile money and cheques tend to be used for larger purchases. So, non-cash transactions dominate in terms of value transacted.

Those non-cash transactions are not being done digitally. Instead they are being done with cheques. This is problematic, because cheques are a costly payment device. They require a lot of time on the back end to be cleared and for funds to be transferred between institutions and accounts. The usage of cheques for stock purchases, according to our merchant interviews, appears to be increasing, even as electronic options become available.

The majority of consumer transactions and stock purchases for small traders are actually done locally. The share of local transactions does seem to be a function of wealth, with richer consumers doing more of their purchases outside the core rural site and in the County Hub instead.

The scale of business sales and remittances have enormous seasonal fluctuations. Urban senders report sending more frequently during the dry/hungry season. We did not have time series data from this research, but interviews suggested some important patterns in cash in and outflows in this community. There is no reason to assume that cash in this community is in equilibrium. It appears as though there is a net inflow of cash driven in large part by M-PESA and agricultural traders – that then recirculates inside the community, leaking in smaller quantities outside the area.

Estimated net inflows appear to vary significantly over the course of the year.
All agents said that they limited allowable deposits because of their own float limitations and concerns about people knowing they were holding large amounts of cash overnight. They limited withdrawals also when they had liquidity problems but, businesses with large local cash needs - like mango and cereal traders - have daily cash transactions that are several multiples of these maximum values.

Even though "cash in" outlets, in this case including M-PESA and an Equity Bank agent, help keep cash local, but they cannot accommodate large enough transactions to eliminate the need to physically move large volumes of cash in and out of the site. "Bridges to Cash" are not enough. Electronic payment options are necessary to tackle this challenge.

### 3. LENS 2 - TIERS OF ECONOMIC ACTORS

The second analysis we did looked less at the geographic movement of cash and more at specific types of transactional relationships to see both current transactional patterns and new opportunities to introduce electronic payments for a diverse range of transactions, for example, wage payments, supplier purchases, and consumer spending. When we look at payments profiles of different tiers of economic actors - consumers, merchants, suppliers, financial service providers - we find that only certain types of transactions are shifting from cash to electronic payments.

The only substantial non-cash income payments are for formal workers and remittances. Agriculture payments stand out, because they are large, infrequent, and yet done in cash.

#### Table 2: The frequency, size, and payment medium of household income transactions*

<table>
<thead>
<tr>
<th>Type of Income</th>
<th>Median Pmt Frequency</th>
<th>Median value</th>
<th>% in Cash</th>
<th>% MPESA</th>
<th>% Bank</th>
</tr>
</thead>
<tbody>
<tr>
<td>Water Sale</td>
<td>333</td>
<td>225</td>
<td>100%</td>
<td>0%</td>
<td>0%</td>
</tr>
<tr>
<td>Boda Boda</td>
<td>300</td>
<td>325</td>
<td>100%</td>
<td>0%</td>
<td>0%</td>
</tr>
<tr>
<td>Business</td>
<td>48</td>
<td>1,500</td>
<td>92%</td>
<td>8%</td>
<td>0%</td>
</tr>
<tr>
<td>Informal Work</td>
<td>25</td>
<td>300</td>
<td>100%</td>
<td>0%</td>
<td>0%</td>
</tr>
<tr>
<td>Plowing</td>
<td>15</td>
<td>2,000</td>
<td>100%</td>
<td>0%</td>
<td>0%</td>
</tr>
<tr>
<td>Remittance</td>
<td>12</td>
<td>2,000</td>
<td>16%</td>
<td>79%</td>
<td>5%</td>
</tr>
<tr>
<td>Teaching</td>
<td>12</td>
<td>20,000</td>
<td>0%</td>
<td>0%</td>
<td>100%</td>
</tr>
<tr>
<td>Agriculture</td>
<td>2</td>
<td>5,000*</td>
<td>100%</td>
<td>0%</td>
<td>0%</td>
</tr>
<tr>
<td>Dividend</td>
<td>1</td>
<td>14,000</td>
<td>0%</td>
<td>0%</td>
<td>100%</td>
</tr>
</tbody>
</table>

*Table data from 20 household interviews.
3.1 How consumers are paid

Looking at how people receive their incomes, we see that there have been large shifts to electronic payments for person-to-person (P2P) remittances and formal salary payments. Such transactions tend to be large in value and infrequent, making the cost of the transfer look small as a percentage of the transaction size. However, agricultural incomes are also large and infrequent, but are still done in cash. This is potentially a low-hanging fruit in terms of shifting to an electronic payment. One barrier, however, appears to be trust. Producers do not know buyers as intimately as employees know their employers and remittance receivers know the senders. Respondents expressed some fear of being “duped” over M-PESA, particularly when they are the ones on the receiving end.

- Daily wage earners would prefer to be paid monthly. They say that small value cash payments make it too easy to spend - they don’t value the payment as much and feel it’s easier to be wasted.
- Respondents told us that electronic payments institute discipline, because the act of having to go withdraw forces you to think about what you need and have at least a rough budget in mind.

3.2 How consumers pay

Not all consumers have the same transaction profiles. We see particularly stark contrasts between the richer households who tend to have a regular source of income and poorer households that tend to have informal income sources. While formal workers are paid monthly by bank or SACCO deposit, households without formal income have a few large income flows per year from agriculture and many smaller, daily inflows from small businesses and casual work.

<table>
<thead>
<tr>
<th>Richer/more formal earners</th>
<th>Poorer / informal earners</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Inflows</strong></td>
<td><strong>Outflows</strong></td>
</tr>
<tr>
<td>Larger, lumpy, predictable income. Receives salary into financial institution in county hub</td>
<td>Spend much greater share of earnings in town</td>
</tr>
<tr>
<td>Leverage salary for large, infrequent loans from formal institutions</td>
<td>Larger transaction sizes</td>
</tr>
<tr>
<td><strong>Outflows</strong></td>
<td><strong>Outflows</strong></td>
</tr>
<tr>
<td>Larger payments (like clothing and school fees) divided into small cash installments; School fees paid daily or weekly</td>
<td>Less frequent transactions for day-to-day needs, like cereals</td>
</tr>
<tr>
<td>Because of small, daily expenses, reluctant to lock up funds in a financial institution</td>
<td>Pay school fees in bulk using cashless method (pay per term)</td>
</tr>
</tbody>
</table>

People PREFER to be paid in fairly lumpy values electronically than in small cash payments.

Figure 12: Frequency of transactions per year Vs Approximate transaction size (Ksh)
Low income households do not make most payments in bulk, but rather match their consumption spending to their small, frequent cash flows. Even school fees, which are requested to be paid in large lump sums each term, are instead paid on small daily or weekly installments in cash by low income households.

- The majority of transactions are very small, under KSh 100.
- Lump-sum payments (>KSh 500) tend to happen in the following situations:
  - Formal salaried households shopping in large supermarkets once monthly in county hub;
  - Secondary school fees, especially when paid by wealthier households (poor families pay in small increments);
  - Remittances sent (already electronic);
  - Business license payments; and
  - Some medical expenses (though often in small increments).

### 3.3 Merchants

We conducted a census of all identifiable merchants in operation at the core site, recording their shop type and some basic information about their transactional patterns with both customers and suppliers. The large majority of retail merchants are small, informal businesses. We were able to identify 188 local merchants, most of which have a permanent presence in the community. However, on market day, there is also an influx of about 32 additional temporary merchants who sell here only once per week, usually visiting other markets throughout the week.

#### Table 3: Monthly revenue of merchants in core site

<table>
<thead>
<tr>
<th>Variable</th>
<th>Sum entire site</th>
<th>Mean /merchant</th>
<th>Median /merchant</th>
</tr>
</thead>
<tbody>
<tr>
<td>Avg. estimated monthly revenue for all merchants</td>
<td>12,000,000</td>
<td>63,786</td>
<td>22,282</td>
</tr>
<tr>
<td>% with 100% local suppliers</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>% with at least one non-local supplier</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Avg. estimated monthly revenue for locally supplied merchants</td>
<td>2,515,016</td>
<td>37,538</td>
<td>10,440</td>
</tr>
<tr>
<td>Avg. estimated monthly revenue for merchants with non-local suppliers</td>
<td>9,476,900</td>
<td>78,322</td>
<td>27,380</td>
</tr>
</tbody>
</table>

The median merchant monthly revenue is around KSh 22,000. Larger merchants source more of their stock from outside the core site.

Market day traders have some unique features:

- Vendors come from all over the county to sell their products here.
- Most visit multiple markets every week, hitting key markets throughout the district or county over the course of the week.
- Important source of cash outflow unless they deposit locally.

While about ½ of market traders leave with cash, the other half instead actually does deposit cash locally at a bank or M-PESA agent.
Table 4: Where do you deposit your business cash?

<table>
<thead>
<tr>
<th></th>
<th>Non market Merchants</th>
<th>Market Merchants</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bank branch</td>
<td>19%</td>
<td>9%</td>
</tr>
<tr>
<td>Bank agent</td>
<td>9%</td>
<td>6%</td>
</tr>
<tr>
<td>MPESA</td>
<td>24%</td>
<td>44%</td>
</tr>
<tr>
<td>House</td>
<td>45%</td>
<td>41%</td>
</tr>
</tbody>
</table>

4. TOWARDS A CASH-LITE ECONOMY

We really only see large shifts of payments to electronic mechanisms for a few transaction types. P2P transactions have clearly shifted to M-PESA. Large value stock purchases are shifting to cheques, but that’s not necessarily the kind of progress we want to see. On wage payments, bill payments, and use of cash merchants for recirculation we see some progress, but there is still a long way to go.

M-PESA gets high marks from users based on its accessibility, testability, and consumer recourse. However, it is not currently well suited as a payments mechanism beyond P2P transactions, in which both parties know and trust one another, parties tend to be in separate locations, values transmitted tend to justify additional costs in terms of both the transaction fees and time needed to visit an agent to deposit or withdraw funds, and network and system delays are only a minor inconvenience.

Cash in facilities are already effectively stemming the flow of cash out of the community via small market traders. However, since they are small-scale businesses, the relative volume of cash leakage that they stop is very small at just KSh 224,000 per month, compared to KSh 6.6 million leaking out for stock and cereal purchases.

Figure 14: Shifts of payments from cash to electronic

Moving towards cash-lite requires prevalent usage of an electronic payment mechanism, but M-PESA is currently ill-suited for this purpose.
Consumers and merchants told us that cash is still cheaper, faster, more convenient, and more trusted for many of their other payments needs.

**Why hasn’t MPESA been adopted, even for free transactions, like Safaricom airtime purchases?**

Most of our respondents purchase one KSh20 scratch card every day. They say that purchasing the scratch card and not developing a habit of buying airtime over M-PESA enforces self-control. Since they would have to go out again to buy a new scratch card, they are less tempted to overspend on airtime, a temptation good for many poor households.

**Opportunities to advance cash-lite**

“Bridges to Cash” are working, but integrated electronic payment devices that are attractive to many players on the value chain are not. For providers, introducing innovative payment devices that could be cheap enough to include all is a risky, costly gamble.

### Can providers make the business case work?

- Very high costs of entry, including infrastructure enabling real-time payments;
- Uncertainty around real-time, reliable clearing mechanisms;
- Necessity of scale; and
- Uncertainty around client transaction behavior and price elasticity.

To maximize the benefits of a cash-lite economy from a consumer’s perspective, we need to move from isolated advancements on some payments types towards an integrated payment space by pushing forward e-payments where there is immediate opportunity and a sound business case while working on improving the attractiveness of e-payments in those dimensions where case to consumers and providers is weaker.

**Figure 15: Opportunities to advance cash-lite**

<table>
<thead>
<tr>
<th>Consumers resistant to use, because:</th>
<th>Merchants resistant to accept more widely, because:</th>
</tr>
</thead>
<tbody>
<tr>
<td>- Bear high fee to send and cover merchant withdrawal cost;</td>
<td>- Inconvenient because they make purchases and payments in cash;</td>
</tr>
<tr>
<td>- Most consumer transactions are small, &lt;KSh100; and</td>
<td>- Fear of fraud if used extensively;</td>
</tr>
<tr>
<td>- Sending an M-PESA payment takes more time than cash</td>
<td>- Network delays;</td>
</tr>
<tr>
<td></td>
<td>- Usually means “paying later”; and</td>
</tr>
<tr>
<td></td>
<td>- Fear of tracking, tax enforcement</td>
</tr>
</tbody>
</table>

![Figure 15: Opportunities to advance cash-lite](image-url)
### Constructing a “cash-lite” research agenda

**Research objective 1: Reduce risks to private providers by investing in information generation around key design issues.**

1. Quantitatively understand transaction profiles (type, size, frequency, location) of a wider set of different consumer segments (Financial Diaries will generate this data, focused on low-income consumers).
2. Quantitative studies with choice architecture to explore price elasticity of demand for e-payments and to provide quick feedback on new pricing models.
3. Consider repeating a shortened version of this study to look at potential behavior changes since M-PESA’s introduction of a new tariff structure that reduces the costs of smaller transactions.
4. Business modeling exercises drawing on consumer level transaction data (Financial Diaries) and merchant data to explore pricing models that could push e-payments products to capture small transactions (ex. Freemium models).
5. Quick, qualitative concept testing for market feedback on new products.
6. Understand the cost of cheques and existing e-payment technology to distributors. (These are the technologies that need to be beaten by new products).
7. Study of merchant and supplier credit management to generate ideas around how new products can help them manage these complexities electronically.
8. Background study of technological and system barriers preventing introduction of reliable, secure, fast payments mechanisms and exploration of costs and benefits of investment in core infrastructure for e-payment functionality.
9. Technological and policy study on interoperability of cash in/cash out and e-payment products.
10. Anthropological study of merchant and consumer perspectives and fears on electronic payments options, aiming to help target marketing for higher rates of adoption and usage.

**Research objective 2: Highlight opportunities to introduce better e-payment mechanisms in payment dimensions where demand is already ripe.**

1. Exploratory study or pilot partnership with an e-payment provider to test viability of micro-payroll concept.
2. Continue to monitor effectiveness of electronic G2P transfers and barriers to “online” vs. “offline” e-payments for government and NGO-sponsored cash transfer programs.

**Research objective 3: Encourage advances in e-payments to grow in a socially inclusive way.**

1. What do Financial Diaries consumer transaction profiles tell us about the potential benefits of cash-lite on poor consumers?
2. Develop scenarios of electronic payment product types (and how they address P2P, P2B, etc.) and model likely social implications, based on what we know about how these transactions occur now. (Ex: Canadian Task Force for the Payments System Review)
3. Qualitative research on budgeting, needs and practices in different target client groups to help understand how e-payments might make it easier or more difficult for households and businesses to manage their finances.
4. Design and concept testing of potential electronic apps to help meet these needs. For example:
   - Being able to set your own cap on daily airtime spending via M-PESA to have self control & electronic money; or
   - Automatically account log or P & L for small businesses.

**Research objective 4: Monitor Kenya’s progress towards an inclusive cash lite economy.**

1. Monitor changing payments patterns and profiles of consumers, particularly in the low income segment (ex: UK Payments Council, The Way We Pay; can partly be captured with FinAccess).
2. Monitor changing payments patterns and profiles of traders and distributors (could take the form of short quantitative panel surveys).
3. Anthropological studies (even short ones) of consumer, merchant reaction to new e-payment products and exploration of patterns, preferences, and perceptions.
4. Quantitative monitoring of consumer and merchant experiences of losses, failures, and system outages using e-payment services (can be partly captured in FinAccess).
5. Anthropological study of how usage changes transaction experience within households and wider networks.
The Kenya Financial Sector Deepening (FSD) programme was established in early 2005 to support the development of financial markets in Kenya as a means to stimulate wealth creation and reduce poverty. Working in partnership with the financial services industry, the programme’s goal is to expand access to financial services among lower income households and smaller enterprises. It operates as an independent trust under the supervision of professional trustees, KPMG Kenya, with policy guidance from a Programme Investment Committee (PIC). In addition to the Government of Kenya, funders include the UK’s Department for International Development (DFID), the World Bank, the Swedish International Development Agency (SIDA), Agence Française de Développement (AFD) and the Bill and Melinda Gates Foundation.