

Access to Energy and Finance: An Integrated Approach to Capture High-Growth Opportunity in Africa

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Dirk Muench, Persistent Energy Capital

Daniel Waldron, CGAP

Xavier Faz, CGAP



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Summary

Advances in solar technology and innovative financing schemes are accelerating access to energy for many poor and rural households. This is particularly true in sub-Saharan Africa where a wave of entrepreneurs is enabling access to electricity through financed home solar systems that people pay for over time. Because providers can remotely disable use of the system and allow payments under a flexible pay-as-you-go (PAYGO) scheme, lower-income households effectively gain access to energy assets that they otherwise would not have been able to afford. This model is becoming the fastest-growing segment in private electricity provision in Africa.

Over time, providers of PAYGO energy services use payment history to finance additional assets (primarily durable goods) or to offer nonsecured loans. Some of the more mature companies that started as retailers of energy systems (e.g., M-KOPA in Kenya) have evolved into diversified consumer loans firms. Households traditionally outside the reach of microfinance institutions and banks are gaining access not only to electricity but also to a formal source of financing.

Despite the proven benefits and profitability of this model, the scale and diversification of these companies' services are constrained by the lack of access to commercial debt financing. Mechanisms used today are inefficient, scarce, and costly. Financial institutions in local markets would be the natural source of such debt financing, but the unsecured nature of loans in PAYGO portfolios makes them too risky to finance. Yet leveraging local financing could help established financial institutions achieve accelerated growth into segments below their traditional target, and at low cost.

This paper analyses the synergies in the distribution of energy and financial services. It describes how an integrated approach could enable financial institutions to profitably serve low-income populations, thus enabling a significant source of growth. It also explains how under proper licensing schemes, energy providers could grow into full deposit-taking financial institutions. It uses the experience of retailer-led banks in Latin America to illustrate the ways in which similar models could evolve in African markets. Because the mechanisms explained in this paper can be applied in a diverse set of contexts (ranging from clean stoves to access to sanitation, health, and other basic services), the implications for expansion of locally financed development are important.

By explaining these opportunities, we hope providers will experiment with these new models and accelerate the pace at which poor households gain access to a range of valued financial and nonfinancial services.

The Expansion of the Off-Grid Energy Sector in Africa

1. The emergence of the pay-as-you-go (PAYGO) model

The fastest growing companies in the African energy sector are businesses selling financed solar energy systems that allow customers to pay in small installments over time. We refer to these businesses as off-grid energy companies (OECs).¹ CGAP has estimated that such businesses will sell 3 million solar home systems in 2015–2020 (Winiiecki 2014).

OECs have taken advantage of the rapid adoption of mobile phones and the more recent development of remote lockout technology to sell larger systems (with more impact potential at the household level) through loans that “feel” like paced consumption of electricity to consumers. As customers pay for energy system use over time, they repay their loan. From the provider perspective, the ability to remotely turn off the systems of nonpayers creates a strong incentive for customers to pay. In addition, large-scale mobile money services have enabled the collection of small, regular payments that improve the scalability of these schemes.

While some companies offer their customers a pay plan of 12–36 months (referred to as a rent-to-own, hire purchase, or installment purchase model) others allow their customers to pay as long as they want to use the system (referred to as a perpetual lease, rental, or utility model).² Whichever variation the OEC pursues, the offer to purchase energy by making small installment payments is very attractive to customers for several reasons:

- Periodic payments make the energy systems and services affordable to lower-income customers.
- Unlike a traditional financial product, customers don’t have to invest their savings into a product that promises benefits that will be realized only over time; they can begin using electricity in-home the same day they take out the “loan.”
- Paced consumption adapts easily to the volatile cash flows of lower-income customers, allowing them to miss a few days of energy payments in a bind, or purchase several weeks during a windfall.
- By financing the sale over a period of time, OECs bring the monthly cost down to a point where it is competitive with existing energy expenditure (i.e., kerosene, dry-cell batteries, and phone charging) for off-grid households.³

By financing the sale for the customer, the OEC can charge enough to make the business attractive to entrepreneurs, employees, and investors alike. Accordingly, OECs pursuing this business model have

¹ Distributed energy services company (DESCO) or PAYGO company are terms used to describe companies that provide

² Perpetual lease model businesses sometimes have an outside date after which the customer acquires title to the system. Because that date is far beyond the expected useful life of the system, we think of these businesses as perpetual lease businesses.

³See Waldron and Faz (2016).

grown at a rate of 100 percent year-over-year (YoY)—the largest five companies, which were all founded over the past five years, have collectively reached about 500,000 households (more than 2.5 million people) (BNEF 2016, p. 29)—and attracted more than \$100 million in foreign direct investments to frontier markets in Africa and South Asia⁴ over the past two years alone.

2. Natural progression toward consumer finance

Most companies in the sector started with the goal of providing modern energy to off-grid households. Over time, some of these companies realized that they could increase their revenue by extending further loans to existing customers. While these secondary loans can be used by customers to buy bikes or appliances, the energy system continues to serve as a control mechanism: if the customer fails to pay, the system can be switched off and it, as well as the secondary asset, could be repossessed.

Companies that offer additional loans build strong customer relationships over time. As competition increases, the strength of the customer relationship and the ability to finance additional loans becomes critical to an OEC's sustained success. Fast growing OECs with the potential to provide commercial returns and therefore attract capital offer a new opportunity to accelerate the pace for financial inclusion in meaningful ways (see Box 1).

Box 1. Expansion of energy drives financial access

OECs are helping expand financial access in two related ways. First, every new customer of an OEC that is offered a payment plan is being provided a financial service: a loan to pay for a secured energy asset. For many customers, this is the first formal financial service they have accessed.^a Repayment of this loan could and should facilitate access to additional financial services.

Second, after providing the loan, OECs have strong incentives to collect payments digitally via mobile wallets. These payments have lower transaction costs than physical cash payments, greater transparency, and allow an OEC to implement more efficient, automated processes on its back-end (web-based management of its customers) to facilitate system locking and unlocking based on customer payment. As a result, OECs are actively pushing mobile wallet registration among new clients. Sales agents for OECs typically double as registered mobile money agents, and are able to sign up a client for a mobile wallet, educate them on how to make payments via mobile money, and provide them with initial or ongoing float (liquidity), depending on the agent structure.

The promise of immediate electrification is a strong incentive to acquire and use a mobile wallet, meaning that OECs are providing a tangible value proposition for mobile money use, especially to rural, lower-income users. And familiarity with mobile banking will allow a successful customer to easily engage with any future digital credit or savings products.

a. One fast-growing OEC estimates that about 50 percent of its customers have never used mobile money wallets or services before buying an energy system.

⁴ See also Bardouille and Muench (2014); Aidun and Muench (2015); and Aidun, Bardouille, and Muench (2015).

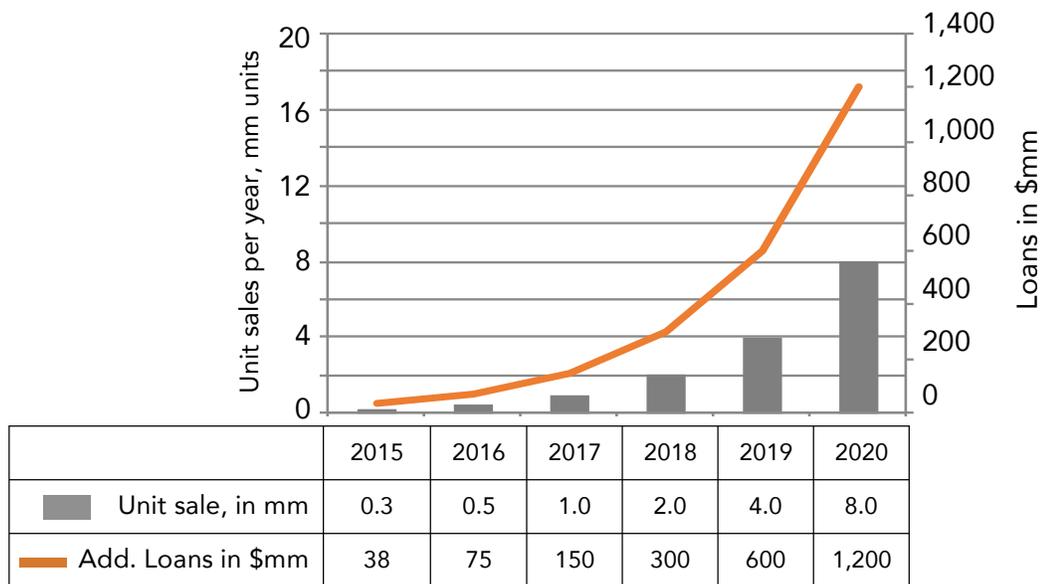
3. Challenges constraining growth of the off-grid energy sector

This development in the energy access sector comes with unique challenges. OECs are originating loans at a breathtaking speed—the fastest growing companies are adding 500 customers per day. This is equivalent to originating \$75,000 in loans per day, assuming an average loan size of \$150.

The first significant challenge is that this portfolio of loans needs to be financed. To reach 1 million customers in 2016, the sector will finance an estimated \$150 million⁵ in additional consumer loans this year. Soon, individual companies will have to raise this amount on an annual basis.

Consider a scenario of 100 percent YoY growth in the sector over the next five years. This would mean that 8 million new systems would be sold in 2020 alone. If the average system price to the customer would remain at \$150, the sector would add loans worth about US\$1.2 billion per year by 2020.

Figure 1. Growth of local currency-denominated receivables created per year given a 100 percent YoY sector growth



The second major challenge for the sector is tied to the first: loans to customers are denominated in local currency. To date, the capital that finances OECs is mostly denominated in hard currency (U.S. dollars or euro), which means an ever larger exposure to foreign exchange risk (Muench 2015).

⁵ We estimate the installed cost per system on average to be \$150. This is a simplification, of course, but it will be sufficient to estimate the magnitude of the financing challenge.

The third challenge is that OECs are originating loans and managing loan portfolios, which requires a skill set and experience that are not typically part of their core competence. Many of these companies started out as energy system retailers or even technology companies that developed their own distribution channels. Developing financial services capabilities—both in systems and in talent—constitute a significant challenge, especially given their rate of growth.

The Business of Retail Banking in Africa

1. The limited reach of the retail banking sector

As the off-grid energy sector in sub-Saharan Africa is in a rapid transformation and growth phase, the financial sector presents a healthy but more static picture: the average bank in a developing African market generated a before-tax return on equity of 18.7 percent in 2013, compared to a global average of 12.6 percent (Čihák, Demirgüç-Kunt, Feyen, and Levine 2012).

However, this profitability is largely based on a large loan size-, high margin-, low-volume business—the opposite of financial services to the Base of the Pyramid (BoP). The presence of high-yield government bonds has allowed African banks to maintain net interest margins of high single or even double digits. According to Bob Diamond, whose Atlas Mara group targets lower-income customers, “It’s a bit of an overstatement but the [main] business model [of banks] in sub-Saharan Africa is to take a [cheap] deposit and buy a [high-yielding] Treasury bill” (Caplen 2015).

The problem is that, despite their overall commercial success, financial institutions have not yet found a way to reach a large part of the population with their services. To illustrate this, the following points have been adapted and updated from Beck and Cull’s 2013 paper, *Banking in Africa*. They reflect comparisons between the medians of two country groups: low- and lower-middle-income African countries on one side, and low- and lower-middle-income countries from other regions of the world. The data are from the World Bank’s Global Financial Development Database.

- In low- and lower-middle-income Africa only 16.1 percent of adults have an account at a formal financial institution, compared with 29.6 percent outside of Africa (Demirguc-Kunt, Klapper, Singer, and Van Oudheusden 2015).
- The median number of branches per 100,000 people in lower-income Africa is 3.4, compared with 9.8 branches in lower-income, non-African settings (GFDD 2013).
- In 2013, the median bank deposit to gross domestic product (GDP) ratio in Africa was 22.4 percent, compared to 41.6 percent in the rest of the world (GFDD 2013).
- Private credit to GDP was a median of 15.7 percent within Africa, versus 39.1 percent in the rest of the world (GFDD 2013).

Financial institutions have struggled to open a commercially viable delivery channel of financial services that can reach the bulk of the African market. The reasons for this situation are relatively well understood:

- Research by the Gateway Financial Innovations for Savings (GAFIS) project indicates that entry-level transaction accounts for lower-income clients are likely to be loss-making under legacy models of banking. In these legacy banking models, lower-income clients open new accounts at branches, keep low balances, make few transactions, and use fixed physical infrastructure such as bank branches and automated teller machines (ATMs) for all cash management. This generates considerable losses. Based on their research with five developing-country banks, a “stylized” account with a \$30 average balance and about two transactions a month could be expected to lose \$2.79 monthly, if the fixed costs of originating and opening the account are depreciated over its expected lifetime (GAFIS 2013).
- Other similar studies conclude that high collateral requirements, time-consuming applications, and inefficient cash management have kept financial institutions for the most part focused on salaried, relatively better-off segments of their markets (Beck and Cull 2013).

The solutions are equally well known and have been discussed in other publications:

- The GAFIS project showed that the use of agent banking greatly reduced the cost of opening an account and managing cash-in, cash-out (CICO) activities, and reduced operating losses compared to a traditional, legacy banking model by 62 percent, to \$1.05 per month.
- Although the GAFIS project closed in 2013, it predicted the emergence of tailored savings and credit products offered through a fully digitized channel (i.e., a mobile phone) and supported by agent networks. Since then, innovations such as the use of alternative data for credit-scoring, frequent SMS touch points with customers, and cloud-based IT systems have further reduced back-end costs.

GAFIS theorized that such innovations would combine to make transactional accounts a break-even proposition on their own, and they are undoubtedly crucial to the future expansion of financial services. But if the best that can be hoped for on an account level is to break even, then the business case for lower-income banking must be based on the ability to cross-sell additional products.

2. Innovations that have helped expand retail banking in Africa

Despite the traditional separation between the African banking sector and the real economy, a pair of financial service innovators have shown glimpses of a brighter future. Capitec in South Africa and Equity Bank in Kenya have generated sustainable profits from previously underserved customers: in 2013 they had combined revenue of over \$4 billion, while serving an estimated 13 million clients (Equity Group Holdings Limited 2014; Capitec Bank Holdings Limited 2014).

The experience of Capitec in South Africa

Capitec originated as a branchless retail bank that relied solely on ATMs and debit cards to reach its customers. It quickly became the lowest-cost banking option in South Africa, offering an all-in-one account, the Global One, via its mobile platform. It now has 600 plus branches, each of which is paperless and cashless to facilitate quick, efficient transactions.

Capitec generates the bulk of its revenue by making a large number of unsecured, higher-interest loans to lower-income customers. The bank originated 2.8 million loans in fiscal year 2015, with an average loan size of under \$500. Its latest annual report indicates that arrears reached 5.4 percent, with the bank reporting earnings of \$170 million (Capitec Bank Holdings Limited 2015).

A comparison of South African banks shows that Capitec is serving a much lower-income segment than its competitors, but with a comparable profit margin (see Figure 2).

Figure 2. High profit margins despite low revenue per customer



Source: BusinessTech (2015).

Figure 2 displays the average revenue and earnings per customer and the profitability of five banks. It shows that (i) Capitec has a similar profit margin to Standard Bank (about 22 percent) while generating only about 20 percent of Standard Bank's revenue per customer; and (ii) NedBank has the highest

profit margin (about 42 percent) despite having the second lowest average revenue per customer. These two data points reflect the proposition that banks can build profitable businesses serving many lower-revenue customers (BusinessTech 2015).

It is interesting to note that Capitec generates 60 percent of its funding from fixed-term retail deposits, showing the potential to fund lending operations at least partly from retail customer deposits (Steyn 2015), a point we will revisit later in this paper.

The experience of Equity Bank in Kenya

Equity Bank, with over 8 million customers, is one of the largest banks in Kenya.⁶ Founded as a savings and loan with a focus on the housing market, it came close to insolvency in 1994. Its current chief executive officer, James Mwangi, helped shift the bank toward providing smaller loans to lower income segments: in 1998 the bank had fewer than 1,000 borrowers, with an average loan balance of \$3,862. Ten years later the average loan balance was \$988, and the bank had over 500,000 borrowers. And although it is working with clients who are perceived as higher-risk, its nonperforming loan (NPL) ratio was 4.19 percent in 2014, which represented a manageable increase from 2011, when it was below 1 percent (MIX Market 2014).

Equity Bank was able to expand quickly by shifting to a lower-cost agent model of banking. It had 17,500 agents by the end of 2014 (Equity Group Holdings Limited 2015), each of whom is able to originate accounts cheaper and quicker than other banks, while removing the necessity of cash management. It relaxed its collateral restrictions, allowing customers to borrow against land, livestock, even their marriage beds. Most recently it made news by acquiring a mobile virtual network operator (MVNO) license,⁷ and shortly after launching its mobile money platform Equitel (Muhumuza 2014). Launched in 2014, Equitel has already attracted over 1.7 million customers, with the promise of vastly reducing costs in the future (Mutegi 2016).

3. Insights from success cases

Capitec and Equity Bank have been able to profitably serve millions of low-income (and traditionally high-risk) customers by doing the following:

- Shifting to lower-cost, agent-based service and distribution networks.
- Increasing process efficiency by leveraging mobile channels and mobile data.
- Adopting high-volume, low-balance, collateral-lite lending models that mirror customer demand.

⁶ Kenyan Central Bank reported that Commercial Bank of Africa (that has M-Shwari with M-Pesa) had 9.35 million deposit accounts in 2014.

⁷ An MVNO is a wireless communication service provider that doesn't own the infrastructure required to over these services.

Together, these innovators showcase two important lessons about financial inclusion:

- BoP customers will use financial services, if those services are properly structured around their very specific requirements: liquidity, product relevance, affordability, and convenience.
- Providing such services can be very profitable. Capitec and Equity are now the seventh and eighth most profitable banks in the world, as measured by returns on assets, according to *Banker* (Karwacki 2015).

In summary, providing financial services can be a profitable business in sub-Saharan Africa even if it is extended to low-income (and therefore on average low-revenue) customers. Adapting the lessons learned from Equity and Capitec will be crucial for any potential collaboration between energy and financial companies; OECs may be able to help increase a bank's customer base, but the bank's ability to profitably serve those customers will determine if that is a boon or a burden.

Rationale for an Integrated Approach

The confluence of approaches to solve what seem to be two largely independent development challenges—access to finance and access to energy—is illustrating synergies that enhance viability and prospects for growth. At the front end, solutions that enable energy access also create mechanisms that bring loans to people without credit history. At the back end, what constrains the expansion of off-grid energy portfolios constitute opportunities for growth of retail banking. By combining competencies, both types of businesses may be able to form deeper, more profitable relationships with a much larger group of customers than they could conceivably reach alone.

1. Complementary assets

OECs manage an ideal channel to deliver small loans

OECs have developed—by necessity—a commercially viable small loan delivery channel that they are using to increase revenue and forge lasting customer relationships. What they lack is the ability to fund and manage a large portfolio of consumer loans.

The OEC's ability to remotely lock and unlock an energy system creates incentives for the customer to make the payments agreed to at the time of sale. In other words, the OEC has the infrastructure in place to effectively manage small loans offered to a relatively unknown customer.

If the customer does not pay within the time constraints allowed, the system is locked and the customer loses use of the asset she has already partially paid for. If failure to pay continues, the OEC can repossess the asset to further limit losses on the initial loan. Because of these controls—remote lockout technology, a flexible repayment schedule, and the potential of repossession—OEC loan portfolios have achieved higher repayment rates than their borrower profiles might suggest.

OECs can achieve high growth rates—the fastest growing companies are adding about 3,000 customers per week. This happens when OECs can leverage an existing cash management infrastructure—mobile money. OECs with the highest growth rates encourage their customers to pay using mobile money services.⁸ In fact they often work hand-in-hand with mobile money providers to sign up their new customers to a mobile money service at the point of sale.

In this way, OECs have implemented the solutions financial institutions have also identified as being necessary to reach millions of customers in a profitable way, even though the financial services used generate little revenue on a per customer basis.

- OECs leverage mobile phone technology and in particular mobile money solutions to receive frequent small payments efficiently and effectively.
- OECs have invested in highly automated customer account management systems leveraging mobile money, cloud-based computing, and application-supported customer relationship management.
- OECs rely on branch-lite, agent-heavy distribution networks.
- OECs provide their customers with tailored products that have high repayment rates.

As a result, OECs have established an ideal small loan delivery channel with highly automated, cashless accounting and significant leverage over the borrower. What OECs lack is access to large-scale funding at a reasonable cost.

In contrast to an OEC's process, consider the delivery channel of an MFI that provides a loan to a customer. After the initial disbursement, the control the MFI has over the loan is limited. There is the threat of collection action—whatever that action may be. But it is both costly and difficult to collect from defaulted borrowers. While it is not easy to collect a locked solar unit from an individual's home, it is significantly more difficult to collect cash or another movable asset, such as a cow.⁹ Cost of collection often drives MFIs toward larger loans and therefore away from BoP customers.

Financial institutions can better originate and manage a portfolio of financed energy assets

Financial institutions have the competence and infrastructure to originate loans and manage consumer credit risk. What's more, they are able to fund a portfolio at much lower cost than an OEC, using long-term deposits as opposed to commercial debt. By collaborating with (or building) an OEC, banks could maximize the use of their assets (existing deposits, branch network, IT system, existing customer

⁸While it is not necessary that customers use mobile money per se, it certainly is more costly for an OEC to administer cash payments. This limits its ability to grow quickly.

⁹Moreover, OECs often recondition and reuse seized systems, capturing at least some of the value of the system repossessed. In contrast, an MFI must undertake a somewhat expensive process of selling a cow or other asset seized as a remedy for a defaulted loan.

relationships, expertise in credit assessment, and banking license) while getting access to the main assets of the OEC (agent distribution network, cloud-based and highly automated payment processing and account management systems, customer relationships, and most importantly their deep reach into communities they could not reach profitably before.)

Table 1. Financial institution vs. OEC—A comparison of key assets, products, strengths, and weaknesses

	Financial Institution	Off-Grid Energy Company
Assets	Branch network	Agent network
	IT system for account management	
	Customer relationships	
	Banking expertise	Cloud-based CRM systems
	Credit assessment	Leverage over customers
	Banking license	
Financial products	Loans	
	Savings accounts	
	Money transfer services	
Key strength	Banking license and know-how	Ability to reach lower-income populations at scale, profitably, with financial services
Key weakness	Ability to reach lower-income populations at scale, profitably, with financial services	Banking license and know-how

Integrated finance and energy delivery could bring increased revenue

OECs can currently reach customers that traditional financial institutions cannot economically serve. OECs have cost-effective access to the BoP customer, and OECs are using their rich database of repayment data to create credit histories on each customer. On the other hand, financial institutions can offer such customers products OECs cannot offer under most banking/lending laws. For example, in many countries, it is permissible for an OEC to offer solar products and other durable goods (additional solar panels, appliances such as TVs, and perhaps even nonenergy products such as bicycles) on credit. This is often called “purchase money financing.” But in some countries, only a licensed financial institution may offer a cash loan that is not connected with the sale of a product offered by the “lender.”

While OECs are able to offer their customers purchase money financing, an OEC/financial institution partnership could enable a combined enterprise to open a complete financial channel to customers, providing the following:

- **Unsecured consumer loans.** In a partnership between a financial institution and an OEC, a customer could be offered cash loans that consumers could use for any purpose: loan proceeds could be for education financing, agricultural inputs, or personal expenses such as weddings or funerals.
- **Savings accounts and term deposits.** OEC/financial institutions could offer a customer who is about to complete his payment plan on an initial purchase of a solar product the opportunity to simply keep making regular installment payments. These would be deposited into an interest-bearing savings account, and over time the individual may choose from a portfolio of term deposits for longer term savings.
- **Insurance.** While depending greatly on the regulatory context, OEC/financial institutions could offer an insurance policy on customers' durable goods purchases, their harvest, or even their livelihoods, with premium payments secured against the solar unit or bundled together with existing financing options.
- **Transaction services.** OEC/financial institutions could offer the customer the ability to send cash within the system from her account to another account as a payment to another vendor, transfer to another individual, etc.

2. Deposits as a source of funding for fast-growing energy portfolios

In a scenario where there is a close integration between an OEC and a financial institution, the synergies between the two businesses can improve financial results. For instance, if OECs—via a partnership with a financial institution or by acquiring regulatory license/permission—had the ability to take deposits from their customers, the deposit balance could provide a significant contribution to the funding needs of the OEC at a lower cost than its competitors. Similarly, if the holding company of an established financial institution acquires or establishes an OEC, the financial institution's deposit base (from OEC's customers) could finance growth of the OEC business making the combined business significantly more profitable.

Lessons from Latin American retailers

This notion has operational precedent. In 2002 a major Mexican retailer, Elektra, acquired a banking license from the central bank. Although it had long sold durable goods on credit, the banking license allowed Elektra to establish a full financial services division, called Banco Azteca, which began accepting savings deposits from its customers. Other retailers in Mexico followed suit, with interesting results: a CGAP-commissioned study shows that durable goods retailers were able to source over 65 percent of their funding needs from customer deposits within eight years of launching an affiliated retail banking operation, thereby lowering their funding costs by 65–90 percent (CGAP 2015).

Figure 3. Financial impact on durable goods retail businesses from strategic move to offer financial services through affiliated businesses

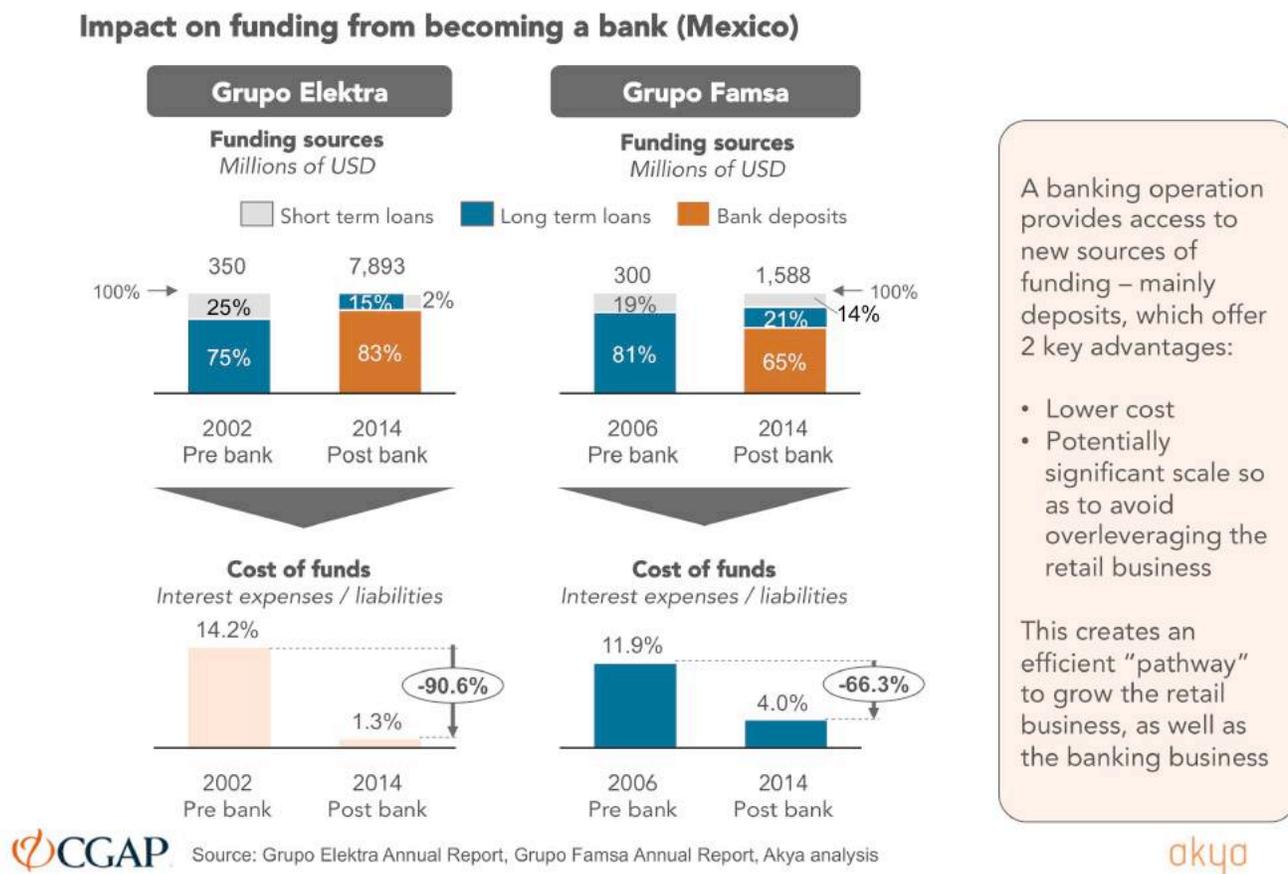


Figure 3 makes three interesting points:

- It illustrates how a lending operation can fund itself through deposit-taking. Within 8–12 years of launching their own affiliated banks, Grupo Elektra and Grupo Famsa were able to source 65 percent and 83 percent of their respective funding needs via customer deposits.
- The cost of funds was reduced by 90.6 percent for Grupo Elektra and 66.3 percent for Grupo Famsa. In other words, deposits not only replaced commercial debt as the main source of funding, they did so at much lower cost.
- Figure 3 shows how the retailers’ respective loan books grew since they acquired banking licenses. Grupo Elektra’s funding needs increased 22 times its original size from 2002 to 2014, approximately 30 percent YoY. Grupo Famsa’s loan book grew more than four times in eight years, or 23 percent YoY. Since expanding into financial services, these combined retail/financing operations have grown at incredible rates.

Not shown in this slide, but equally important, is the impact these developments have had on financial inclusion. These two retail banks, along with a third (BanCoppel), have played an outsized role in

growing the Mexican financial system. In 2014, while retailer banks encompassed 31 percent of all deposit accounts in the country, those accounts held only 3.6 percent of actual deposits, with an average balance of just \$270.

This broad, shallow pool of deposits reflects the realities of BoP banking: it is an asset-led, low-balance, high-volume business. Interviews with the retail banks revealed that “being the first company to grant credit to customers creates ‘sticky’ relationships” and “a strong sense of loyalty.” It is that sort of relationship that could transform banking in sub-Saharan Africa.

The particular opportunity to use deposits in Africa

The thesis that deposits could provide an OEC with significant funding is further supported by statistics showing the extent that MFIs’ savings products are used relative to their loan offerings. This is particularly the case in sub-Saharan Africa.

First, there is a high demand for savings products in the informal sector: 59.6 percent of adults in sub-Saharan Africa reported in 2014 that they had saved money in the past year, but only 15.9 percent had saved money with a formal financial institution (Findex 2014).

Second, by studying the available data from MFIs we find that savings accounts are in high demand in Africa: the number of people who save through MFIs is much larger than the number of people who borrow.

Figure 4. Number of net savers in microfinance institutions

Number of net savers = customers saving money - customers borrowing money



Source: MIX Data 2014

Figure 4 dramatically highlights that customers in Africa use their MFI accounts more frequently as savings accounts than as borrowing accounts. In no other region of the world is the number of MFI savings customers so much larger than the number of borrowing customers than in Africa.

Third, the amounts saved by MFI customers are significant. The aggregate amount of MFI deposits in sub-Saharan Africa is about \$5 billion (MIX Market 2014). Consider that this amount would already be sufficient to finance consumer loans for 33 million TIER 2 solar home systems with a value of \$150 each. In other words, \$5 billion in deposits would be enough to finance basic energy services—light, radio, phone charging, and other small appliances—for 33 million households or about 150 million people. This is illustrated in Figure 5.

Figure 5. Aggregate value of MFI deposits in sub-Saharan Africa

We compare sub-Saharan Africa with South Asia—where the microfinance sector is much more developed.

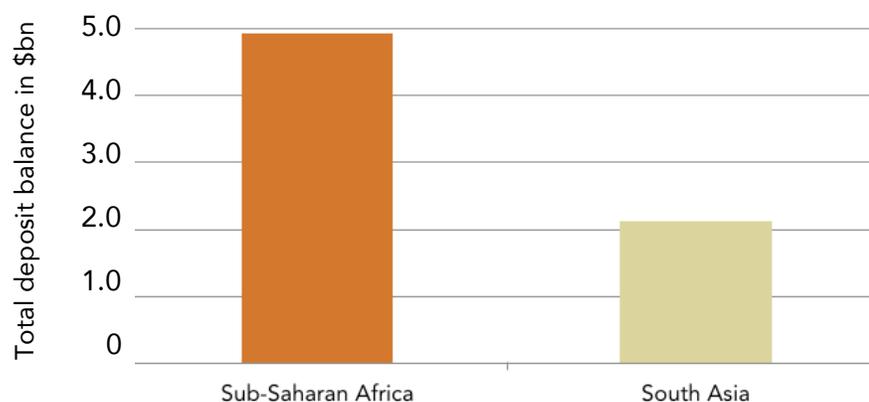


Figure 5 shows that financial institutions in sub-Saharan Africa have a high balance of deposits. The aggregate amount of MFI deposits in sub-Saharan Africa is about \$5 billion (2014 MIX data). This would be sufficient to finance consumer loans for 33 million TIER 2 solar home systems with a value of \$150 each.

If one adds the additional deposits from new customers that such an OEC/financial institution partnership could yield, it becomes clear that this is a significant opportunity to fund the expansion of access to energy.

3. Local currency funding to mitigate foreign exchange risk

We have shown above how quickly the loan balances of OECs (including financial institution-owned OECs) and OEC/financial institution partnerships could grow. While deposits from local consumers could help to finance these loan balances, they would offer another unique benefit to the OEC/financial institution partnership: as these deposits are in local currency, they would represent matching liability to the local currency loan assets on the balance sheet of OEC/financial institutions and therefore mitigate currency exposure.

Currently, most OECs are backed by international equity investors and are borrowing from hard-currency-based lenders. The main assets on the balance sheet of an OEC (or the finance company affiliate of the OEC) are local currency loan receivables; the main liabilities on their balance sheets are hard currency (U.S. dollar, euro) loans. Without access to local liabilities, i.e., local currency deposits, OECs carry a significant net long local currency position (Muench 2015).

In this context the untapped opportunity to use consumer deposits to fund the OEC is particularly relevant and attractive. The savings are in local currency as are the loans. The combination of an OEC with an affiliated financial institution to use the significant savings by its customer base to finance loans for new customers would enable the OEC to avoid currency risk all together.

Figure 6 shows the impact on the net currency exposure if an OEC were able to use customer deposits to fund its receivables.

Figure 6 illustrates how the net currency exposure of an OEC is reduced from \$6.415 million to \$0.875 million by assuming a consumer finance loan in local currency instead of in U.S. dollars. It shows an example of an OEC with receivables of 7,915 in local currency but only 1,500 in local currency obligations. Borrowing in U.S. dollars to finance those receivables puts the OEC in a dangerously long position in local currency, in which it is essentially betting on local currencies to appreciate against the U.S. dollar and euro. Needless to say, this “bet” goes against a decade of currency trends in sub-Saharan Africa. Any devaluation of the local currency will result in increased costs to the OEC that are unrelated to its business and operations. These costs will no doubt reduce the equity value of the OEC. Funding the OEC’s balance sheet in local currency mitigates this risk.

Figure 6. The typical balance sheet of an OEC and the resulting net currency exposure

t=0; August 15, 2015

Assets [Present value cash in-flow]	USD denom.	Local currency (LCY) denom.
Cash	200	
Inventory including goods in transit	1,563	
<i>Present value of contractual revenue</i>		7,915
Liabilities [Present value of cash out-flow]		
Working capital facility	2,344	
Consumer finance loan	5,541	
<i>Present value of operating costs</i>		1,500
Equity	293	
Net position (short) / long LCY		6,415

t=0; August 15, 2015

Assets [Present value cash in-flow]	USD denom.	LCY denom.
Cash	200	
Inventory including goods in transit	1,563	
<i>Present value of contractual revenue</i>		7,915
Liabilities [Present value of cash out-flow]		
Working capital facility	2,344	
Consumer finance loan		5,541
<i>Present value of operating costs</i>		1,500
Equity	293	
Net position (short) / long LCY		875

4. Summary

There is a strong business case for combining energy and financial services in sub-Saharan Africa.

- OECs and retail banks have complementary assets—OECs possess the tools to viably and effectively acquire a low-income customer base and control repayment risk, while financial institutions have a balance sheet and the skills needed to manage a large loan portfolio.
- Licensed financial institutions have the ability to capture deposits as a large source of low-cost capital, which can fund high-growth energy portfolios, fueling expansion for both OECs and financial institutions.
- Local financing sources dramatically reduce the OEC’s exposure to foreign exchange risk. In combination with access to the local deposit market, this significantly improves the viability of delivery of both energy and finance to low-income households.

Despite the compelling rationale for a unified offering, there are important challenges to operationalize synergies between businesses. Below we explore various scenarios by which energy and financial services could be combined.

Potential scenarios to capture high-growth opportunity

There are several ways in which OECs and financial institutions can combine their capabilities:

- **Through a close partnership.** OECs and financial institutions could partner to capture the synergies of an integrated business, each focusing on its core competencies. Such a partnership would require each party to adopt specific roles, develop systems to combine their service offerings, and streamline end-to-end business processes.
- **An OEC can set up a retail bank.** OECs can expand their business into a full financial services offering (as opposed to simply selling more products on credit) by obtaining adequate licensing to take deposits. This could be done in a way similar to which Mexico's retail industry evolved into full retail banks.
- **A financial institution can set up or acquire an OEC business.** Financial institutions could expand their activities into OEC operations or acquire OECs. This may be subject to regulatory limitations that would determine the ways in which this could be executed.

Aspects of these options are discussed in more detail below.

1. Close OEC/financial institution partnership

Separating the OEC business into a retail and a finance operation

OECs are a combination of a durable goods retailer and an in-house finance company. OECs provide pay plans to their customers because it helps achieve the OECs' primary goal of selling energy assets and appliances to a large number of customers. One could consider OECs to be durable goods retailers of one kind of product and internal financial institutions that provide limited financial services, in this case loans.¹⁰

While many OEC management teams agree with this perspective and readily state that they are looking to exploit the opportunity of this combination more systematically, in practice very few OECs separate their retailer arm from their finance operation. The sale of products is tightly linked to issuing a loan, and therefore most OECs organize their business as an integrated offering. Though their main competency lies in the energy/retail space, OECs spend significant resources and efforts developing a finance arm.

In an ideal partnership, the OEC would focus on the retail component of the business (selling energy assets), and it would leverage the financing offered by a local financial institution. Because the OEC manages the customer relationship and has the ability to control repayment risk (through remote locking and threat of repossession), the OEC would be better positioned to underwrite loans

¹⁰ This is a model followed by large consumer goods companies in developed markets. For example, most auto manufacturers have finance company affiliates that provide financing to car-buying customers. Those companies also provide other financial services once they have "captured" a customer.

originated by the financial institution. Such partnership would require a scheme that enables the OEC to guarantee the credit risk of an evolving loan portfolio. From a finance point of view, an OEC is well-equipped to establish a credit risk guarantee (since its margin on retail sales can easily cover credit risk). This would relieve the OEC from having to build its own balance sheet.

In practice, this would turn the OEC into a purely durable goods retailer with natural adjacencies toward a broad range of other durable goods such as clean stoves, toilets, bicycles/motorcycles, among others. As the retail business grows, the financial institution would also grow—in customers and in assets. This has an important benefit for the financial institution, as it would provide a low-cost/low-risk opportunity to grow (fast) into lower-income segments that lie outside its natural focus given level of income, geographic dispersion, and/or lack of credit history.

This scenario unlocks significant potential for future growth for financial institutions. This brings additional upside opportunity from cross-selling other financial services to those clients. Also, a financial institution can set up similar partnerships with other providers of durable goods, not only in energy, but in other categories.

Box 2. OECs: The challenge in separating the retail business from the finance business

A necessary condition toward establishing retail-finance partnerships is to model the OEC business as the combination of a retail operation and a consumer finance business. In practice, this means being able to develop and track answers to the following questions:

- What is the total cost of financing charged to consumers?
- What level of default is implied in the financing charge to the consumer?
- What is the profitability of the OEC's consumer financing activity and how does it compare with the profitability of financial institutions' consumer finance operations?
- What is the retail gross margin after financing?
- What is the retail net margin after accounting for cost of sales and service?

Integrating key business processes

There are different ways in which a partnership can be established. However, some key assumptions would be (1) that OEC largely maintains its established high-growth business, without overly burdening its commercial processes with banking requirements; (2) the financial institution has an interest to diversify its asset base toward retail banking; and (3) the regulatory environment offers basic provisions for agent banking. From a business process perspective, a partnership would require some degree of adaptation from the financial institution in the following areas:

- **Underwriting.** OECs are able to assess and approve a client quickly, in the field, without any pledged collateral. In some scenarios the OEC may underwrite loans made by the financial institution, and so the financial institution would either have to become comfortable with the

OEC's underwriting, or work with the OEC to develop a more robust, but equally convenient, assessment process.

- **Know your customer (KYC) and account opening.** Different countries have different regulations pertaining to tiered-KYC and account openings. A simple option is that the OEC becomes an agent for the bank, where regulation for agency banking is in place. Nothing the OEC does should be outside the normal range for agent banking, but this would probably require the OEC agent to be registered and trained by the financial institution. Both institutions would need to cooperate to ensure that the agent's incentives remain properly aligned.
- **Payments integration.** The financial institution and OEC would have to connect their back-end systems. Most OECs tie their PAYGO functionality to payments, and many financial institutions have core banking systems with specific protocols. These systems must be integrated in a manner that is acceptable to both parties, without producing service disruptions.
- **Customer relationship management.** What brand(s) does the customer see? Who answers service calls? Who handles payment frictions? And most importantly, who analyzes repayment data and cross-sells products to the customer? These answers (and many others) will vary by case, but they are crucial in determining the long-term viability of any partnership.

2. An OEC sets up a deposit-taking institution

OECs could apply for a banking license and build the banking business from the ground up. This would eventually give them access to a stable, cheap source of financing (their own customer deposits), while allowing them to capture the entire value chain and resultant higher profits. To explore this route, an OEC's leadership team needs to disaggregate its finance arm from its retail business, and then model the potential investment compared to its current cost of capital/debt.

As shown in Figure 3, retailers that have chosen this route in Latin America have captured significant benefits on their retail business (e.g., Grupo Elektra grew its annual sales more than 20 times, in 12 years), while also building financial institutions with a very broad customer base. It is important to consider that Latin American markets have more developed markets for durable goods. So while the parallel applies, the speed at which business can grow will likely differ.

However, building their own financial institution would mean investing management time and resources in building a new business from the ground up, which would reduce the ability and focus on the growth of the retail arm. Also, setting up a full deposit-taking institution would typically involve meeting the capital and regulatory requirements necessary to acquire a banking license, and would take longer to operationalize than other options.

3. Financial institution sets up or acquires OEC business

Financial institutions have the competence and infrastructure to originate and manage a loan portfolio, take deposits, and offer broader financial services—transactional accounts, payments, insurance. While financial institutions may consider a close partnership with an OEC to expand into new segments, some financial institutions may choose to invest in building a channel that can bring a more integrated

offering to customers. An OEC business may be a way to build an agent channel that brings more revenue, and which in fact is a commercially attractive business on its own. This can happen in either of two ways:

- One possibility is that financial institutions could develop the technology to offer asset-linked loans directly to BoP customers (see Box 4). Financial institutions could buy PAYGO-enabled solar home systems from one of several manufacturers that offer these systems now (through an affiliate business or wholly owned subsidiary). They could license software from firms such as Angaza or Lumeter and integrate these into their existing account management software. The challenge in this scenario would be to create the unique sales and service operation that OECs develop as part of their core energy offering.
- Another possibility is that instead of sourcing or even developing the technology platform (hardware and software) themselves, institutions could of course also acquire¹¹ an OEC and integrate the OEC's technology and operations with the financial institutions. While acquisitions would likely come with their own set of challenges, from valuations of OECs to legal hurdles, a successful consolidation of a financial institution and an OEC could bring many business and operational benefits.

Box 4. Asset-linked lending in India

One of India's leading MFIs has developed a partnership model that shows an example of how OEC and financial institution businesses could be combined. The partnership involves the MFI, a smart phone distributor, and the international manufacturer of such smart phones. The partnership aims at making the phone affordable to the lower-income population in India.

The MFI created a proprietary back-end that makes loan origination efficient (paperless), automates payment accounting, and enables software-supported customer relationship management. This back-end basically fulfills the same functions as the back-end of OECs in Africa. The MFI plans to issue loans as small as \$100 to its customers when they buy smart phones in its branches or from its distribution partner.

The MFI will use its own branch and agent network to distribute the smartphone, but at the same time, it will leverage the distribution network of one of the largest smartphone distributors in the region.

This partnership promises to be attractive to the distributor and manufacturer as the phones become affordable to a large part of the population.

The MFI is particularly excited because it believes that by offering a loan for an aspirational product, such as these smart phones, it can grow its already large customer base further. The MFI believes that it would minimize defaults and losses through its ability to permanently lock the smart phone if the customer defaults on his or her loan. By leveraging mobile money and its proprietary software, it sees a particular opportunity to grow into lower-income segments it previously was not able to reach profitably.

¹¹As noted, this may be subject to restrictions or may not to be accomplished through a common holding company.

Additional Perspectives

Although the primary actors in any unified offering would be the OEC and financial institution, there is a set of secondary players that could do much to facilitate such a collaboration. In this section we briefly explore the issue from the perspective of regulators, investors and development agencies, and mobile network operators (MNOs).

1. The regulatory agenda

The combination of an OEC's retail operations with financial services offered by a financial institution raises regulatory concerns on at least two fronts:

- Adequately licensing the finance operation. Not all financing operations are regulated, but different countries may set rules for how nonfinancial institutions engage in lending, either for the sale of goods or lending for nonspecific purposes.
- Adequate customer protection. Ensuring that the incentives for selling on the retail side do not compromise adequate measures to manage credit risk that could lead to over-indebtedness in customers.

Adequately licensing the finance operation

Although each country has its own system of laws to regulate financial services, in general, nonfinancial institutions may finance the sales of different kinds of goods and services as long as the source of capital to finance the sales is their own capital. In some countries, nonfinancial institutions may also lend money for any purpose, subject to anti-money laundering (AML) rules as well as customer protection norms.

Deposit taking for the purpose of intermediation is typically reserved for banking institutions or similarly regulated firms. Although the exact definition of "deposit taking" may vary, in general, it will be a regulated activity that cannot be offered by an OEC.

There are several models for regulating agent banking and for regulating nonbank issuance of electronic money. A number of countries in Africa have opened pathways for OECs and financial institutions to integrate their offerings, primarily enabled by MNOs' development of mobile money.

In our view, regulators should consider the development benefits that can result from the combination of energy delivery and financial access and seek to permit, as much as possible, schemes that enable such business arrangements. In particular they should consider (1) the opportunity that this can mean for expanding the formal financial system; (2) the benefits consumers get by being formally included while gaining access to broader services; and (3) the risks stemming from large loan portfolios issued outside the banking system. Facilitating OEC/financial institution partnerships can accelerate the expansion of the formal financial system and, therefore, impact the way lower-income communities

develop in emerging markets. To facilitate OEC/financial institution partnerships (and other similar financing arrangements), regulators can refine their regulations specifically around the following:

- Proportional KYC requirements for account opening, which would enable individuals to be easily linked to a formal financial institution through an account at the time they acquire an energy system.
- Flexibility in enabling financial institutions to delegate AML/KYC procedures unto third parties (e.g., OEC staff) to facilitate, for example, how an OEC may conduct KYC and open an account *in situ*, when an energy system is sold, on behalf of a financial institution.
- Agency banking regulations that enable an OEC and its field service staff to act as agents for a financial institution.

Adequate customer protection

Regulators must be ever mindful of the need to protect consumers in financial transactions. “Unbanked” citizens engaging in their first financial transactions by financing energy services through an OEC or depositing their savings via mobile money would be the most vulnerable to fraud by unscrupulous companies.

As businesses move with financed products toward the BoP, the risks of over-indebting customers grow accordingly. While the financing makes the product affordable to the customer, the payments under such a financing arrangement may be unaffordable. With the business’ incentives focused on selling their product to ever more customers and the customers desiring the product they are being offered, it is easy to see how businesses may offer more and customers may take on loans beyond what they can actually afford. This is the focus of traditional consumer protection frameworks. What is important to consider is the potential to strike a careful balance to protect consumers on the one hand without impairing the business case for providing financial services to BoP consumers on the other (Dias and McKee 2010). Consumer finance portfolios created through OEC/financial institution partnerships would enable improved visibility to regulators to monitor the health of the credit market.

A start may be the set of basic parameters contained in “The Client Protection Principles” put forward by the Smart Campaign (www.smartcampaign.org) (see Box 5).

Box 5. The Client Protection Principles

Appropriate product design and delivery: Providers will take adequate care to design products and delivery channels in such a way that they do not cause clients harm.

Prevention of over-indebtedness: Providers will take adequate care in all phases of their credit process to determine that clients have the capacity to repay without becoming over-indebted.

Transparency: Providers will communicate clear, sufficient, and timely information in a manner and language clients can understand so that clients can make informed decisions.

Responsible pricing: Pricing, terms, and conditions will be set in a way that is affordable to clients while allowing for financial institutions to be sustainable.

Fair and respectful treatment of clients: Financial service providers and their agents will treat their clients fairly and respectfully. Providers will ensure adequate safeguards to detect and correct corruption as well as aggressive or abusive treatment by their staff and agents, particularly during the loan sales and debt collection processes.

Privacy of client data: The privacy of individual client data will be respected in accordance with the laws and regulations of individual jurisdictions. Such data will be used only for the purposes specified at the time the information is collected or as permitted by law, unless otherwise agreed with the client.

Mechanisms for complaint resolution: Providers will have in place timely and responsive mechanisms for complaints and problem resolution for their clients and will use these mechanisms both to resolve individual problems and to improve their products and services.

2. Investors and development institutions

Investors—commercial, impact, or strategic investors—often appear to adopt relatively siloed approaches to investing: they look at financial inclusion, microfinance, insurance, and energy access as different and distinct silos. Such a perspective is limiting and leads to missed opportunities to work across sectors (see Box 6). An integrated approach to expanding access to energy and finance may provide additional perspectives and options to increase effectiveness of their portfolios.

For development institutions and donors that seek to promote either energy access or financial inclusion, it is likewise clear that the critical path is to promote them in a synergistic way. There are many things that can be done to promote pathways to integrated offerings of these services, ranging from grant assistance for the capital-intensive aspects of creating a common enterprise (whether by joint venture, merger, or product expansion by either an OEC or financial institution toward the other's business) to assisting in the policy development process with local governments to create regulatory openings for these opportunities.

The exploration of linkages between financial access and the achievement of other development goals around health, education, and sanitation, among others, is still an open agenda. The key learning from this paper is that there is a confluence of solutions that target the same (poor) households, and each development agenda is looking to solve the last mile problem in its own siloed way, overlooking a

range of possibilities that would make their approaches more effective. Digital finance is the key disruptive factor. Its ability to provide a means to monetize new businesses enables a range of services to become viable.

Box 6. Complementary approaches in development

While integrating energy and financial services makes sense from a business perspective, the combined offering is also consistent with recent research on the complex nature of poverty. According to the Oxford Policy and Human Development Initiative, “multidimensional poverty is made up of several factors that constitute poor people’s experience of deprivation” (OPHI 2016). Those factors include, but are not limited to, income, food, education, health care, electricity, clean water, credit, and productive assets.

Anti-poverty initiatives must reflect the complex nature of the condition. From 2006 to 2014, CGAP partnered with the Ford Foundation to conduct a global pilot of the Graduation Approach, an “integrated, five-step methodology aimed at transitioning extremely poor populations into sustainable livelihoods.” Targeted households were given consumption support, a means of saving money, a productive asset (typically livestock or petty trading), skills training, and ongoing coaching/encouragement. Randomized control trials conducted by independent researchers in six of the pilots found significant and enduring increases in consumption, income, and psychological well-being.

By providing customers with a mobile wallet to facilitate payments, affordable credit, reliable clean electricity to replace kerosene expenditures, plus the potential for a savings account and future financed asset purchases, the combined offering has the potential to scale in ways that more traditional, siloed approaches do not.

3. Upside for MNOs

MNOs would benefit directly from any additional use of their infrastructure; their profits increase whenever money moves on their “rails.” OECs add thousands (someday the number will be in the millions) of people to their mobile money platforms and send their entire revenue through such platforms.

In one scenario MNOs could stay passive and let financial institutions and OECs take the risks associated with developing this market. However, MNOs could also use their significant brand value, their customer relationships, their agent network, branches, and political influence to capture a larger part of the value that can be generated by providing basic energy products and financial services to the millions of off-grid customers. In addition, MNOs are currently seeking new revenue streams to offset the decline in voice revenue. For the operators not to get involved would be akin to a superior athlete not to compete in a second discipline, despite a high chance of success, because she already won another competition at the same games.

MNOs’ key assets include the following:

- Reaching the unbanked with financial services requires the use and seamless integration of mobile phone services into the IT system of the financial service operation; the organization of

this seamless integration can be costly and lengthy, and the lack of the reliability can be a risk to the OEC/financial institution. MNOs, due to the nature of their business, have largely overcome these obstacles and should have little trouble integrating.

- MNOs have by far the most customer data (airtime top-ups, call data records) that would be valuable for OECs/financial institutions as they assess new customers.
- MNOs have an existing distribution and sales agent network that extends into the rural areas targeted by OECs/financial institutions.

Actual participation in the sector could take several forms. MNOs can facilitate OEC success by offering preferential rates for customer bill payments, integrating them to their USSD menus, and co-branding products. Some already do this to an extent: MTN is working with Fenix in Uganda and Nova Lumos in Nigeria; Digicell is closely linked with Re-volt in Haiti; and Safaricom has had a long relationship with M-KOPA in Kenya.

Additionally or alternatively, MNOs could take over the financial side of the offering. While heavily dependent on the regulatory context, several MNOs are already offering credit and savings products. Integrating the OEC offering should not be very difficult, but it could be transformative in terms of pushing regular, nonairtime transactions.

Conclusion

We believe that it is in the best interest of commercially motivated institutions—financial institutions and OECs—to explore innovative and closer partnerships. Such a partnership can unlock substantial value for entrepreneurs and shareholders. Specifically, it would do the following:

- Enable OECs to focus on the sale and servicing of energy systems and open further opportunities to distribute adjacent products (e.g., clean stoves, toilets, and furniture, among others).
- Enable financial institutions to grow their customer base, through a low-risk/low-acquisition cost, and provide avenues for offering broader financial services.

As the off-grid energy sector develops, it would behoove financial institutions to observe and emulate the innovative approaches to financial inclusion that are being successfully demonstrated. For too long banking in sub-Saharan Africa has had little relationship to the real economy, with commercial banks unwilling to adapt to the needs of the general population. As more consumers are able to access consumer financing for durable goods, the hope is that this situation will begin to change.

Financial institutions have the ability to play a transformative role in this sector and, in doing so, leverage opportunities for their own long-term growth. At the extreme, if beyond energy access, financial institutions apply these mechanisms more broadly, they will build a broad customer base and expand avenues for growth of the real economy.

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