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Smartphones for the Unbanked: How Mobile Money Will Drive Digital Inclusion in Developing Countries

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EXECUTIVE SUMMARY

In much of the developing world, mobile phones far outnumber bank accounts. This imbalance has led to the growth of an increasingly complex "mobile money" ecosystem allowing funds to be transferred among mobile phone users.

Mobile money services, which were essentially non-existent at the turn of the century, are now available in over 70 countries, and are used to move billions of dollars every month.[1] In many countries, the number of outlets—storefronts where customers can open accounts and deposit or retrieve funds associated with transactions conducted on their mobile phones—exceeds the number of bank branches.[2] For the unbanked, who lack access to traditional bank accounts but who nonetheless have high rates of mobile phone ownership, mobile money is playing a critical role in financial inclusion by providing access to stored value accounts and a growing set of financial services.

But there are broader implications as well. The growth of mobile money has closed the loop in a positive feedback cycle that increases the incentives for the unbanked to use mobile phones, which in turn increases the market for companies delivering phone-based financial services. As mobile phones become more capable and less expensive, mobile money will drive digital inclusion in developing countries in ways that go far beyond the set of currently available transaction-focused services.

Today, smartphone penetration rates are high in the wealthiest nations but still low among the unbanked, who typically use less expensive "feature phones"[3] with more limited functionality. We already know what the developed world looks like when smartphones are everywhere. But the far more interesting question may be what the developing world will look like when cost declines bring entry-level smartphones

within financial reach of nearly everyone. This paper proposes some answers to that question and identifies some ways to maximize financial and digital inclusion using mobile technologies.

INTRODUCTION: WHAT IS MOBILE MONEY?

Mobile money generally refers to financial transaction services available to anyone with a mobile phone—including the unbanked. The bricks-and-mortar component of mobile money systems is the network of shops (also called "outlets" or "branches") staffed by small business owners who are authorized "agents"[4] of the mobile money service provider. To open an account, a new customer visits an outlet and registers by providing a mobile phone number, proof of identification,[5] and information such as name and date of birth. A text message is then sent to the customer's mobile phone providing instructions for account activation. Once the account is active, the customer can make a deposit at any outlet associated with the same mobile money service provider by providing cash in exchange for electronic credit to the account, which is accessed through the mobile phone.

In addition to providing a means to store value, mobile money is commonly used for person-to-person transfers. To transfer funds, a customer dials an access code from a mobile phone to connect to the service provider, and then enters the mobile phone number of the recipient, the amount to transfer, and a PIN. The recipient is notified of the incoming transfer via text message, and can then visit an outlet to withdraw the corresponding cash. As mobile money systems have matured, service offerings have broadened beyond person-to-person transfers to include bill payment, shopping, payments from employers to workers, cash withdrawal at ATMs, payment and collection of rent, and access to interest-bearing savings accounts and loans.[6]

While mobile money can be used by anyone, its impact has been greatest on the unbanked in developing countries, who often live in places without traditional bank branches—or, if they are in larger towns and cities, may be unable to meet minimum balance requirements associated with some bank accounts. Many of the unbanked, do, however, own mobile phones, and thus have devices suitable for financial transactions literally in hand. In addition, they often live and work in close proximity to retail establishments selling groceries and other goods. Mobile money systems provide the missing link in the chain by turning retail establishments into locations where cash can be converted into and out of electronic funds. Once the funds are in electronic form, transactions can be conducted using a mobile phone.

GROWTH OF MOBILE MONEY SERVICES

The growth of the mobile money industry has been extraordinary. GSMA's 2012 Global Mobile Money Adoption Survey[7] identified 150 mobile money services available at the end of 2012, up from 109 in 2011, 65 in 2010, and only 2 in 2003.[8] As of September 2013, the number of services has grown to over 190.[9] During the month of June 2012 alone there were over 220 million transactions conducted, with an aggregate value of $4.6 billion.[10] In Kenya, Madagascar,

Tanzania and Uganda the number of mobile money accounts now exceeds the number of bank accounts, and in several dozen countries there are more mobile money outlets than bank branches.[11] To date, much of the activity in mobile money has been concentrated in Sub-Saharan Africa, and in particular East Africa. However, there is also a significant and growing mobile money presence in Latin America, East Asia, and South Asia.[12]

Kenya's M-Pesa service is by far the most visible mobile money success story. M-Pesa was launched in early 2007[13] by Kenyan cellular network operator Safaricom in partnership with Vodafone[14] and within seven months had over a million active customers.[15] There are now more than 17 million M-Pesa customers[16] in Kenya—a number equivalent to well over half of all Kenyans age 15 and older[17]— and over 65,000 M-Pesa agents.[18] According to a survey conducted in late 2011, M-Pesa was used in "86 percent of households outside Nairobi;"[19] the percentage today is likely even higher. In the six months ending March 31, 2013, $6 billion was transacted within M-Pesa.[20] This corresponds to $12 billion annually, making M-Pesa a central pillar of the financial system in a country with an estimated 2012 GDP of $41 billion.[21]

South Africa-based Vodacom, which is majority owned by Vodafone,[22] has introduced M-Pesa in other African countries including Tanzania in 2008,[23] South Africa in 2010,[24] and Mozambique in 2013.[25] Vodafone partnered with mobile network operator Roshan to launch a mobile money service branded as M-Paisa in Afghanistan in 2008,[26] and in 2013 entered the Indian market in a partnership with ICICI Bank.[27] Other mobile money services with significant market traction include Airtel Money, which is available in countries including Kenya, Tanzania, Ghana; and MTN Mobile Money, available in Uganda, South Africa, Ghana, and elsewhere.

Awareness has grown as well. Under funding from the Bill & Melinda Gates Foundation, research consulting group InterMedia conducted a one year tracking study in Tanzania to measure awareness and use of mobile money. Starting in September 2011, the study covered four waves. In the fourth wave of the study, which took place in fall 2012, InterMedia surveyed 2000 Tanzanian adults (defined for purposes of the study as persons aged 15 and older) and found that 99% of them were aware of at least one mobile money service,[28] with 82% reporting that they had seen or heard a mobile money advertisement in the previous month.[29]

The InterMedia study also identified a significant increase in use of mobile money in Tanzania, with 45% of the fall 2012 survey participants deemed "active" users; i.e., they had used mobile money services at least once in the preceding three months. By contrast, in fall 2011, only 24% were classified as active.[30] In addition, the study indicated increasing diversity in the Tanzania mobile money market. In fall 2011, 79% of the active mobile money users among the survey respondents identified Vodacom M-Pesa as the mobile money service they used "most frequently."[31] By fall 2012, that number had fallen to 65% as Tigo Pesa and Airtel Money gained more market traction.[32]

Of course, the industry's trajectory in Kenya and Tanzania isn't yet globally representative. However, the experience there and in a growing list of other countries shows that given properly designed and managed services and an enabling regulatory environment, mobile money can indeed be the tool for financial inclusion claimed by its advocates.

STILL A YOUNG INDUSTRY

Despite the promise and demonstrated successes of mobile money, it is still a very young industry. In fact, over 90% of the services available today were launched in 2009 or later.[33] Even the strongest advocates of mobile money acknowledge that many services are still struggling to achieve profitability. Former Vodafone executive Susie Lonie, who is credited with a key role[34] in creating the original M-Pesa service in Kenya and is now with Consult Hyperion's mobile money team, reportedly stated in August 2013 that "maybe not even 10% of [mobile money services] are either successful or clearly on the road to becoming successful, by which I mean breaking even and looking like becoming profitable."[35] GSMA has also observed the divergence in growth rates among different services, writing that "mobile money is a two-tier landscape"[36] in which only a relatively small minority of providers, which GSMA terms "sprinters," experience rapid increases in transaction volume following launch.

The high number of services experiencing lackluster growth is sometimes cited as evidence of questionable long-term viability of the overall mobile money industry. But that interpretation is problematic for multiple reasons. First, it is premature to assume that providers that have not yet attracted large numbers of customers will never be able to do so. By analogy, consider the early skepticism directed towards the cellular industry itself. Subscriber "numbers have not grown as quickly as predicted," the *New York Times* stated in a 1985 article titled "Cellular Phones: The Big Payoffs Are Still On Hold."[37] In addition, the article noted, "cellular telephones do not always perform as advertised. Users occasionally hear static—or other people's conversations—on the line. Some cannot always get a connection or have calls that are suddenly dropped." One expert quoted in the article commented that the start-up of cellular systems "will go down in telecommunications history as one of the costliest engineering and marketing disasters ever." Of course, with the perspective of a few additional decades, we now know that cellular communications has been more successful than anyone imagined in the early days of the industry.

Another important factor impacting growth is regulation. Mobile money services complement and broaden the reach of the financial system by providing both an extensive network of locations for account opening, cash-in, and cash-out transactions as well as convenient mobile phone-based account access. They are not, however, full-service banks (e.g., they do not issue loans in the manner of traditional banks) and shouldn't be regulated as such. When the regulatory environment is adapted to the specific characteristics of mobile money,

those services can thrive. In Sri Lanka, mobile money adoption grew rapidly after the 2012 introduction of new, more mobile money-friendly regulations.[38] By contrast, in South Africa, cumbersome transaction reporting requirements have been cited as a reason for the initially slow uptake of M-Pesa following its introduction there in 2010.[39] South African regulations have recently been revised, leading to optimism that mobile money offerings there will now get better traction.[40]

Finally, any nascent, high-opportunity industry will attract more entrants than the market can support. Again by analogy, consider that the overwhelming majority of social networking companies founded in the last decade have struggled to reach profitability, and many have folded. But some, including Facebook, Twitter, and LinkedIn, have flourished. Viewed from the consumer's standpoint, social networking is a thriving, healthy industry offering plenty of choice and competition. The same will hold true in a mature mobile money industry. As long as consumers in any given country can choose from among at least a few mobile money service providers, the fact that other providers may have tried and failed to reach profitability in the same market is of less consequence.

SMARTPHONES FOR THE UNBANKED

In inflation-adjusted terms, the cost to purchase a basic mobile phone has dropped by a factor of about 80 since the mid-1980s.[41] Thanks to this cost decline, a consumer technology that was once accessible only to the wealthy is now common even in the world's poorest regions. But while basic mobile phones are widely used everywhere, smartphones are still too expensive for most of the unbanked.

The financial barriers that the unbanked face in purchasing Internet-capable phones is another form of exclusion, and one that, thankfully, will be eliminated as smartphones—or at least smartphones as we currently think of them[42]—decline in cost. In the future, entry-level smartphones will be within financial reach of almost everyone—including many of the unbanked. The only question is when that will happen.

At a global level, the trend towards a smartphone-dominated future is already well under way. According to research firm Gartner, Inc., smartphones outsold feature phones for first time ever during the second quarter of 2013, accounting for 225 of the 435 million mobile phones sold worldwide during the quarter.[43] While the transition to smartphones started among wealthier populations, it will reach the unbanked much faster than most people expect, both in terms of wireless network upgrades to support more data-intensive applications as well as consumer device affordability.

Ericsson predicted in a 2012 report that by 2017, 85% of the world's population will live in areas served by 3G networks.[44] In 2014, the least expensive smartphones in Kenya are

expected to cost under $50.[45] A few years after that, entry-level smartphones will cost no more than today's feature phones. When they can more easily afford to do so, the unbanked will purchase smartphones for many of the same reasons that everyone else does, including the convenience of a touchscreen interface, access to Internet-based services, the ability to run applications, a more capable display, and status.

So what will mobile money look like as increasing numbers of the unbanked adopt smartphones? Mobile money providers will still need to offer services compatible with phones having only basic calling and text messaging capabilities, since not all customers will have a smartphone. But, there will be opportunities and competitive pressures for service providers to broaden their offerings to match the increasing diversity of mobile platforms owned by their customers.

This will mean introducing new products that can take advantage of smartphone capabilities. In particular, there will be an increasing number of smartphone financial transaction apps targeting unbanked smartphone owners. Touchscreen interfaces will be leveraged to provide customers with easy access to information that can cumbersome to display on a feature phone, including balance and transaction history. Regulation permitting, inter-network transfers, both across mobile money providers as well as into and out of the traditional banking system, will become easier for providers to implement, and easier for customers to use.

TOWARDS FULL FINANCIAL AND DIGITAL INCLUSION

Even today, when smartphone ownership among the unbanked is still very low, mobile money service offerings are becoming increasingly sophisticated. For example, in late 2012, Safaricom and the Commercial Bank of Africa (CBA) teamed to launch a service called M-Shwari, which, as described in a news release, provides "interest bearing saving accounts and . . .the ability to take out small loans."[46] The release went on to note that:

> Safaricom customers can sign up to the M-Shwari interest bearing savings account, provided by CBA, directly through the M-Pesa menu on their phone. There are no forms to complete and no need to visit a bank branch. M-Pesa customers can also apply to CBA for a mini-loan, again directly from their phone.[47]

As of May 2013, M-Shwari reportedly had 1.2 million customers and over $4.5 million in outstanding loans.[48]

The introduction of offerings like M-Shwari will increase the incentives to move to smartphones. After all, while it is possible to access detailed account information and submit loan applications from feature phones, these tasks will be much less cumbersome using the more flexible user interfaces and displays found in smartphones. Under this positive feedback

cycle, as more of the unbanked acquire smartphones, there will be more service offerings introduced to leverage smartphone capabilities, including the ability to run apps and access the Internet.

The spread of smartphones across the full economic spectrum can thus play a critical role in taking the "un" out of "unbanked," and in moving towards what the Center for Financial Inclusion defines as "full financial inclusion": "a state in which everyone who can use them has access to a full suite of quality financial services, provided at affordable prices, in a convenient manner, with respect and dignity. Financial services are delivered by a range of providers, in a stable, competitive market to financially capable clients."[49]

Even more fundamentally, by helping to improve the utility of mobile phones today and driving smartphone adoption in the future, mobile money will be central to digital inclusion in ways that that go far beyond financial inclusion. Information access is closely tied to empowerment in all communities, rich and poor. As costs decrease, smartphones will become the primary platforms for digital information exchange in poorer communities in developing countries, just as they already are in many other communities. And just as they do elsewhere, smartphones in the hands of the unbanked will be able to run a diverse set of apps from service providers and third-party developers.

REGULATION: ENABLER OR IMPEDIMENT?

The combination of continued electronics advances, cellular network infrastructure improvements, and the enormous global wireless market will ensure the universal availability of increasingly capable and cost-effective consumer mobile products. Technology alone, however, is not enough to ensure that those products will be fully leveraged by unbanked populations. Where mobile money thrives, broader digital services will eventually thrive as well. But *whether* mobile money thrives is directly tied to the local regulatory environment. Far more than technology, regulation will be the biggest factor in determining how quickly today's unbanked move towards full financial and digital inclusion.

The most commonly articulated regulatory concern regarding mobile money is crime.[50] Like any other system enabling financial transactions, mobile money is sometimes exploited for criminal activity. However, regulatory overreaction (or inaction) that impedes the launch and use of mobile money services in the developing world would make no more sense than overly burdensome regulations impeding people in the developed world from using the Internet, which can also be misused for illicit purposes. The much better approach is to map the lessons learned from combating crime in the traditional financial system to the mobile money industry in appropriate ways. The key word here is "appropriate."

Consider the Financial Action Task Force (FATF), which is an intergovernmental group founded in 1989 that how has over 30 members.[51] FATF recommendations, which were most recently updated in 2012[52] are intended to help combat money laundering and terrorist financing (often expressed using the combined acronym AMT/CFT), as well as proliferation of weapons of mass destruction. Some of the FATF recommendations—e.g., those relating to record keeping[53]—could be followed by mobile money service providers without undue burden. By contrast, the FATF recommendation on customer due diligence is wholly unsuited to mobile money. That recommendation, among other things, would charge financial institutions with

> . . . conducting ongoing due diligence on the business relationship and scrutiny of transactions undertaken throughout the course of that relationship to ensure that the transactions being conducted are consistent with the institution's knowledge of the customer, their business and risk profile, including, where necessary, the source of funds.[54]

Clearly, imposing this sort of responsibility on mobile money agents would be financially, logistically, and legally[55] impractical.

Approaches to addressing mobile money risks have been considered in a 2010 study by the Kenya School of Monetary Studies, USAID, and Booz Allen Hamilton. The resulting "Mobile Financial Services Risk Matrix"[56] identified a range of objectives and policy options, including a "point-based AML/CFT system allow[ing] flexibility for consumers with various forms of identification; while limiting risk by embedding a standard due diligence requirement network-wide."[57]

In the regulatory discussion, it is certainly prudent to think about what can go wrong. But it is also critical to view regulation as an enabler. Claire Alexandre, Ignacio Mas, and Daniel Radcliffe, who have worked at the Financial Services for the Poor program at the Bill & Melinda Gates Foundation, have written that "[t]raditional banking regulation needs to be adapted to enable commercial players—banks, mobile operators, and retailers—to experiment with new partnership models, while still protecting the stability of the financial system as a whole, the integrity of transactions, and the safety of customers' deposits."[58] Among other solutions, they advocate "Tiered Know Your Customer regulations that permit immediate account opening with minimum barriers for poor people, with a progressive tightening of KYC as their usage of financial services grows."[59] Fortunately, approaches such as this are gaining increasing traction, both with respect to mobile money as well as for traditional banks.[60]

It is also important to keep in mind that unlike mobile money providers, banks leverage the pooled funds from their depositors to provide liquidity to the market through loans. Financial regulation aimed at mitigating the risks raised by this and other forms of intermediation

is largely inapplicable to mobile money service providers.[61] As Daniel Radcliffe and Rodger Voorhies wrote in a 2012 paper, "[r]ather than treat the provision of financial services as an 'all or nothing' proposition, requiring full-fledged prudential regulations any time a provider accepts funds from the public, regulators can create a class of non-bank e-money issuers who offer basic accounts and payments services, but do not intermediate those funds."[62]

The goal of financial inclusion is, of course, more than enough reason to get mobile money regulation right. But for today's unbanked, mobile money services are a subset of what will eventually be an extremely diverse ecosystem of mobile technology-based offerings, many of them outside the financial sector. Sensible, balanced mobile money regulation is thus both a means to an immediate end, as well as an enabler of long-term growth in commercially viable services providing broader digital inclusion.

CONCLUSIONS

Thirty years ago, few would have imagined that mobile phones would become common in some of the world's poorest communities. Fifteen years ago, few would have imagined that mobile phones would turn out to be a central tool for financial inclusion in those communities. Today, it is no longer farfetched to suggest that mobile money and the financial inclusion it facilitates are just the first steps in a much broader move towards digital inclusion.

The spread of the technology that will make this happen—most notably, the availability of highly capable smartphones at very low cost and the network infrastructure enabling their use—will occur as a natural and inevitable consequence of continued electronics price declines and network upgrades. The main uncertainty lies in regulation. It is critical for governments to advocate and adopt policies allowing efficient delivery of a broad range of digital services to unbanked populations whose primary—and in many cases only—information technology interface is a mobile phone.

ENDNOTES

1. See Pénicaud, Claire, State of the Industry – *Results from the 2012 Global Mobile Money Adoption Survey [PowerPoint presentation]*, GSMA (Feb. 2013), available at http://www.gsma.com/mobilefordevelopment/wp-content/uploads/2013/03/MMU_Results-from-the-2012-Global-Mobile-Money-Adoption-Survey.pdf.
2. See Pénicaud, Claire, *State of the Industry – Results from the 2012 Global Mobile Money Adoption Survey* [White paper], GSMA (2013), *available at* http://www.gsma.com/mobilefordevelopment/wp-content/uploads/2013/02/MMU_State_of_industry.pdf (noting at pg. 1 that as of June 2012 there were "more mobile money agent outlets than bank branches in at least 28 countries").
3. "Feature phone" here is used to refer to all mobile phones that are not smartphones. (The definition of smartphone is addressed *infra*, in note 42.) Sometimes, though not in this paper, "feature phones" are distinguished from even less expensive "basic" or "budget" mobile phones.
4. While the merchants who operate mobile money outlets are often referred to as "agents" by both customers and by mobile money service providers, they are not agents in a legal sense. More formally, a person who is an agent "has legal authority to act for another," and the acts of the agent bind the entity the agent is representing. See, e.g., "Agency," NOLO's Plain-English Law Dictionary, retrieved from http://www.nolo.com/dictionary/agency-term.html (last visited Sept. 1, 2013). Mobile money "agents" do not have the ability enter into binding commitments on behalf of a service provider.
5. Specific requirements for identification documents can vary. For example, in Kenya, to open an M-Pesa account customer needs to provide one of a Kenyan National ID, Passport, Military ID, Diplomatic ID, or Alien ID. *See How to Resister for M-PESA*, Safaricom Limited, http://www.safaricom.co.ke/personal/m-pesa/how-to-register (last visited Sept. 1, 2013).
6. See Robin Arnfield, *Haiti Leads in Mobile Payments*, Partners in Prepaid, Apr. 23, 2012, https://www.partnersinprepaid.com/topics/articles/haiti-leads-in-mobile-payments.html, for an example of shopping and payment to workers using mobile money. *See MTN Ghana introduces mobile money ATMs*, Ghana Business News, Aug. 15, 2013, http://www.ghanabusinessnews.com/2013/08/15/mtn-ghana-introduces-mobile-money-atms/, for an example of ATM services allowing cash withdrawal of funds from mobile money accounts. Examples of bill payment using mobile money are described in *M-PESA launches Pay Bill account*, BiztechAfrica.com, July 27, 2013, http://www.biztechafrica.com/article/m-pesa-launches-pay-bill-account/6551/ and Myjoyonline, *MTN Ghana launches Mobile Money bill payment service*, ModernGhana.com, Dec. 17, 2010, http://www.modernghana.com/news/308935/1/mtn-ghana-launches-mobile-money-bill-payment-servi.html. For a description of payment and collection of rent using M-Pesa, see Margaret Wahito, *Kenya: You Can Now M-Pesa That Rent*, AllAfrica, Aug. 21, 2013, http://allafrica.com/stories/201308211206.html. For mobile money services providing access to interest-bearing savings accounts and loans, see the description of Safaricom's M-Shwarma service later in this paper.
7. Pénicaud, *supra* note 2.
8. *Id*. at pg. 5.
9. *Mobile Money Deployment Tracker*, GSMA, http://www.gsma.com/mobilefordevelopment/programmes/mobile-money-for-the-unbanked/tracker (last visited Sept. 4, 2013, noting "192 live deployments.").
10. Pénicaud, *supra* note 2, at pg. 1. The GSMA report notes that airtime top-ups comprised 61% of the total transactions, but that 82% of the total transacted value was due to transfers. See *Id*., at pg. 18.
11. *Id*. at pg. 1.
12. *Id*.
13. Vodafone Press Release, *Safaricom and Vodafone launch M-PESA, a new mobile payment service*, Mar. 13, 2007, http://www.vodafone.com/content/index/media/group_press_releases/2007/safaricom_and_vodafone.html.
14. 35% of Safaricom's shares are owned by the Government of Kenya; 40% are owned by Vodafone, and the remaining 25% are publicly traded. See *Corporate Fact Sheet*, Safaricom Limited, http://www.safaricom.co.ke/about-us/investor-relations/investor-dashboard/corporate-fact-sheet (last visited Aug. 19, 2013).
15. *Celebrating 5 Years of Changing Lives*, Safaricom Limited, http://www.safaricom.co.ke/mpesa_timeline/timeline.html (last visited Sept. 1, 2013).
16. *FY 2013 Presentation* [PowerPoint presentation] ("Safaricom Presentation"), Safaricom Limited, at pg. 13, *available at* http://www.safaricom.co.ke/images/Downloads/Resources_Downloads/FY_2013_Results_Presentation.pdf (last visited Sept. 2, 2013) (noting 17.11 million M-Pesa customers as of March 31, 2013).
17. Of Kenya's total (as of July 2013) estimated population of 44 million, approximately 25.3 million are age 15 or over. See *"Kenya", The World Factbook 2012-13*, Central Intelligence Agency, available at https://www.cia.gov/library/publications/the-world-factbook/geos/ke.html (last visited Sept. 1, 2013).
18. Safaricom Presentation, *supra* note 16, noting at pg. 13 that "26,000 M-PESA agents added in the year; now 65,547 M-PESA agents."
19. See Billy Jack & Tavneet Suri, *M-PESA extends its reach*, GSMA Apr. 5, 2012, http://www.gsma.com/mobilefordevelopment/m-pesa-extends-its-reach.

20. Safaricom Presentation, *supra* note 16. The presentation notes at pg. 13 that Kshs 522 billion was transacted within M-Pesa during the half year spanning Oct. 2012 to Mar. 2013. Using an approximate average exchange rate during this period of $1 U.S. = 86 Kenyan shillings, this corresponds to $6.07 billion, or the annualized equivalent of slightly over $12 billion.
21. Kenya's estimated GDP for 2012 was $41.1 billion. See *The World Factbook 2012-13*, *supra* note 17.
22. *The who, what, where and why*, Vodafone.com, http://www.vodacom.com/com/aboutus/whereweare (last visited Sept. 1, 2013).
23. Vodacom Press Release, *Vodacom Announces Intention to Launch Vodafone M-PESA Mobile Money Transfer Service in Tanzania*, May 8, 2008, http://www.vodafone.com/content/index/media/group_press_releases/2008/vodacom_announces.html.
24. *Vodacom to Launch M-PESA in South Africa*, cellular-news.com, Mar. 30, 2010, http://www.cellular-news.com/story/42624.php.
25. *Mozambique: Vodacom Launches M-Pesa Service*, AllAfrica.com, May 27, 2013, http://allafrica.com/stories/201305280313.html.
26. Vodafone Press Release, *Vodafone and Roshan Launch First Mobile Money Transfer Service in Afghanistan*, Mar. 10, 2008, http://www.vodafone.com/content/index/media/group_press_releases/2008/vodafone_and_roshan.html.
27. ICICI Bank Press Release, *ICICI Bank and Vodafone India Launch 'M-Pesa'*, Apr. 17, 2013, http://www.icicibank.com/aboutus/article/mpesa-launch-icici-bank-vodafone-india.html.
28. *Tanzania Mobile Money Tracker Study: Wave Four Report* [Report], InterMedia, at pg. 8 (Mar. 2013), *available at* http://www.intermedia.org/wp-content/uploads/TZ-MM-Wave-4-Report-FINAL.pdf.
29. *Id*. at pg. 9.
30. *Id*. at pg. 14.
31. *Id*., at pg. 15.
32. *Id*.
33. There are over 190 global money services available as of Sept. 2013. *See Mobile Money Deployment Tracker, supra* note 9. Also, at the end of 2008, there were only 15. See Pénicaud, *supra* note 2, at pg. 5. Even if all 15 of the services available at year-end 2008 were still available today, that would constitute less than 8% of the total.
34. *Meet Susie Lonie, the Inventor of M-Pesa,* Mwakilishi.com, Nov. 29, 2010, http://www.mwakilishi.com/content/articles/2010/11/29/meet-susie-lonie-the-inventor-of-m-pesa.html.
35. Gareth van Zyi, *90% of mobile money services worldwide are unprofitable*, WebAfrica.com, Aug. 7, 2013, http://www.itwebafrica.com/mobile/339-africa/231439-90-of-mobile-money-services-worldwide-are-unprofitable.
36. Pénicaud, *supra* note 2, at pg. 8.
37. Gordon Graff, *Cellular Phones: The Big Payoffs are still on Hold*, N.Y. Times, June 23, 1985, http://www.nytimes.com/1985/06/23/business/cellular-phones-the-big-payoffs-are-still-on-hold.html.
38. Pénicaud, *supra* note 2, at pg. 10.
39. Nicola Mawson, *Vodacom tries again with M-Pesa*, iTWeb Limited, May 20, 2013, http://www.itweb.co.za/index.php?option=com_content&view=article&id=64201.
40. *Id*.
41. A February 1984 New York Times article put the cost of a mobile phone at "$2,500 to $3,000." See *Pace Quickens in Cellular Radio Market*, N.Y. Times, Feb. 14, 1984, http://www.nytimes.com/1984/02/14/business/pace-quickens-in-cellular-radio-market.html. Using CPI numbers published by the Social Security Administration at *Average CPI By Quarter And Year*, Social Security Administration, http://www.ssa.gov/oact/STATS/avgcpi.html (last visited on Sept. 1, 2013), this corresponds to about $1200 in 2013 dollars. Today, off-contract mobile phones can be purchased for as little as $15. (For one example, see this recent news story noting that a Nokia 1280 can be purchased in India for under 1000 Rupees, corresponding to about $15: Arul Shaji, T*op 5 Cheapest Nokia Mobile Phone in India below Rs 1000-2000*, News Bucket.org, http://www.newsbucket.org/2013/04/top-5-cheapest-nokia-mobile-phone-in.html (last visited on Sept. 1, 2013). Dividing $2750 (the midpoint of the 1984 range given above) by $15 gives $80. These costs are to purchase the phone itself; usage charges are of course separate.
42. The term "smartphone" can mean somewhat different things to different people, though most definitions implicitly or explicitly recognize the presence of a screen and Internet access. PC Magazine defines a smartphone as "a cellular telephone with built-in applications and Internet access." See "Smartphone," PCMag.com Encyclopedia, retrieved from http://www.pcmag.com/encyclopedia/term/51537/smartphone (last visited Sept. 1, 2013). Merriam Webster defines a smartphone as "a cell phone that includes additional software functions ([such] as e-mail or an Internet browser)". See "Smartphone," Merriam-Webster Online, retrieved from http://www.merriam-webster.com/dictionary/smartphone (last visited Sept. 1, 2013).
43. Gartner, Inc. Press Release, *Gartner Says Smartphone Sales Grew 46.5 Percent in Second Quarter of 2013 and Exceeded Feature Phone Sales for First Time*, Aug. 14, 2013, http://www.gartner.com/newsroom/id/2573415.
44. Gilstrap, Douglas, Traffic and Market Report on the Pulse of the Networked Society, Erisson, at pg. 15 (June 2012), *available at* http://www.ericsson.com/res/docs/2012/traffic_and_market_report_june_2012.pdf, at (noting that "[b]y 2017, an astonishing 85 percent of the world's population will be covered by WCDMA/HSPA networks.")

45. See Margaret Wahito, *Smartphones will get cheaper in Kenya, predicts player*, Capital Group Limited, Aug. 19, 2013, http://www.capitalfm.co.ke/business/2013/08/smartphones-will-get-cheaper-in-kenya-predicts-player/, noting that "Qualcomm Business Director Billy Owino is predicting that the cheapest smartphone in Kenya could cost as low as Sh4,000 by next year driven mainly by competition among manufacturers." At $1 = 85 Kenyan shillings, this corresponds to about $47.
46. Vodacom Press Release, *Safaricom Launches M-Shwari – Offering Interest and Loans – On M-Pesa*, Nov. 27, 2012, http://www.vodafone.com/content/index/media/group_press_releases/2012/m-shwari.html.
47. *Id*.
48. See Eric Ombok, *Safaricom profit rises on M-Pesa growth*, Business Day, May 15, 2013, http://www.bdlive.co.za/africa/africanbusiness/2013/05/15/safaricom-profit-rises-on-m-pesa-growth, noting that in May M-Shwari had "390-million shillings in outstanding loans". In mid-May, when this article was published, the exchange rate was approximately $1 U.S. = 84 shillings, corresponding to about $4.6 million.
49. The Center for Financial Inclusion (CFI) defines "full financial inclusion" as "a state in which everyone who can use them has access to a full suite of quality financial services, provided at affordable prices, in a convenient manner, with respect and dignity. Financial services are delivered by a range of providers, in a stable, competitive market to financially capable clients." See, *Who We Are*, Center for Financial Inclusion at Accion, http://www.centerforfinancialinclusion.org/about (last visited on Sept. 1, 2013). CFI also provides a more detailed description at *Financial Inclusion: What's the Vision?*, Center for Financial Inclusion at Accion, http://centerforfinancialinclusionblog.files.wordpress.com/2011/12/financial-inclusion-whats-the-vision.pdf (last visited on Sept. 1, 2013).
50. Of course, there are other regulatory concerns as well, including systemic stability, safety of funds on deposit, etc.
51. *About Us*, FATF, http://www.fatf-gafi.org/pages/aboutus/membersandobservers/#d.en.3147 (last visited on Sept. 1, 2013).
52. See *The FATF Recommendation: International Standards on Combating Money Laundering and the Financing of Terrorism & Proliferation*, FATF (Feb. 2012), *available at* http://www.fatf-gafi.org/media/fatf/documents/recommendations/pdfs/FATF_Recommendations.pdf.
53. FATF Recommendation 11, which addresses record keeping, provides (among other things) that "Financial institutions should be required to maintain, for at least five years, all necessary records on transactions, both domestic and international, to enable them to comply swiftly with information requests from the competent authorities. Such records must be sufficient to permit reconstruction of individual transactions . . . so as to provide, if necessary, evidence for prosecution of criminal activity." See *id*. at pg. 15 (FATF Recommendation 11).
54. *Id*. at pg. 14 (FATF Recommendation 10).
55. It would be legally impractical, among other reasons, because mobile money "agents" are not formally agents. See *supra* note 4.
56. Kenya School of Monetary Studies, United States Agency for International Development & Booz Allen Hamilton, *Mobile Financial Services Risk Matrix* [Report], GSMA (July 23, 2010), available at http://www.gsma.com/mobilefordevelopment/wp-content/uploads/2012/06/mobilefinancialservicesriskmatrix100723.pdf.
57. *Id*. at pg. 43 (item 7.1).
58. Alexandra, Claire, Mas, Ignacio & Radcliffe, Daniel, *Regulating New Banking Models that Can Bring Financial Services to All*, Vol., 54, No. 3, Challenge Magazine, at pg. 117 (Aug. 1, 2010), *available at* http://papers.ssrn.com/sol3/papers.cfm?abstract_id=1664644.
59. *Id*. at pg. 122.
60. See, e.g. Xavier Faz, *Mexico's Tiered KYC: An Update on Market Response*, CGAP, June 25, 2013, http://www.cgap.org/blog/mexicos-tiered-kyc-update-market-response.
61. While new services such as M-Shwari are enabling mobile money customers to obtain small loans, they do so by connecting customers directly to traditional banks. The mobile money service provider is not providing the loans.
62. Radcliffe, Daniel & Voorhies, Rodger, *A Digital Pathway to Financial Inclusion*, Social Science Research Network, at pg. 11 (Dec. 11, 2012), *available at* http://papers.ssrn.com/sol3/papers.cfm?abstract_id=2186926.

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