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An Empirical Examination of Why Mobile Money Schemes Ignite in Some Developing Countries But Flounder in Most

By David S. Evans and Alexis Pirchio*

14 March 2015

Abstract

Mobile money schemes have grown rapidly in some developing countries but failed in many more. This paper reports the results of an empirical study of mobile money schemes in 22 developing countries chosen based on prior evidence to include roughly equal numbers of successes and failures. It uses a combination of quantitative and qualitative evidence to determine why some countries succeeded in launching mobile money schemes and others failed. The analysis is guided by multi-sided platform economics and in particular recent work on the role of ignition and critical mass. We found that of the 22 countries, mobile money schemes have grown rapidly in 8; mobile money schemes have grown but not rapidly in 3; and mobile money schemes have largely failed to take hold in 8. (It is still too soon for us to make a call in 2 countries and there are no bases to determine ignition for 1 country.) Based on a detailed investigation into the similarities and differences between these countries and across the categories we reached several key findings. The first finding is the most robust and important. (1) Heavy regulation, and in particular an insistence that banks play a central role in the schemes, together with burdensome KYC and agent restrictions, is generally fatal to igniting mobile money schemes. (2) Mobile money schemes have been more likely to succeed in poorer countries that lack basic infrastructure. (3) The growth of the send-receive and the cash-in/cash-out platforms must go hand in hand. (4) Ignition and explosive growth occurs quickly or not at all.

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I. Introduction

Many countries have seen the launch of mobile money schemes in the last decade. In a handful of those countries, one or more of the schemes ignited and grew explosively and, as a result, a significant fraction of the population uses mobile money for sending and receiving money and in some cases for other financial services. Unfortunately, most mobile money schemes have not ignited and, as a result, in most countries only a small portion of the population uses mobile money if they have access to mobile money at all.¹ The causes of success and failure are not patently obvious. People are, for example, using mobile phones to send and receive money in Zimbabwe where the schemes ignited, but not in South Africa, its much wealthier neighbor, where the schemes fizzled.

This paper explores the factors that lead to success or failure of mobile money schemes in developing countries. We focus on these poorer countries because we are interested in the role of mobile money schemes for creating financial services platforms in countries where many people lack access to banks. We also focus on mobile money schemes in poorer countries because the ones in developed countries are competing with highly efficient electronic payment systems including cards and most people have access to banks. Mobile money schemes in developed countries face different challenges than those in developing countries and are therefore not comparable.

The empirical study is based on an analysis of 22 developing countries in which mobile schemes have been introduced in the last decade. The countries were chosen to include roughly equal numbers of successes and failures based on a preliminary look at the evidence. They include 14 in Africa, 5 in Asia, and 3 in Latin America.

Mobile money schemes are based on two related platforms. One is the electronic money platform that connects senders and receivers of mobile money. The other is the agent platform that enables people to put cash into or take money out of mobile money accounts; the agent platform is known as the Cash-In/Cash-Out (CICO) platform. The recent economic literature on multi-sided platforms provides a framework for analyzing the mobile-money platforms.² Mobile money schemes developing countries are three-sided platforms consisting of senders, receivers, and agents.

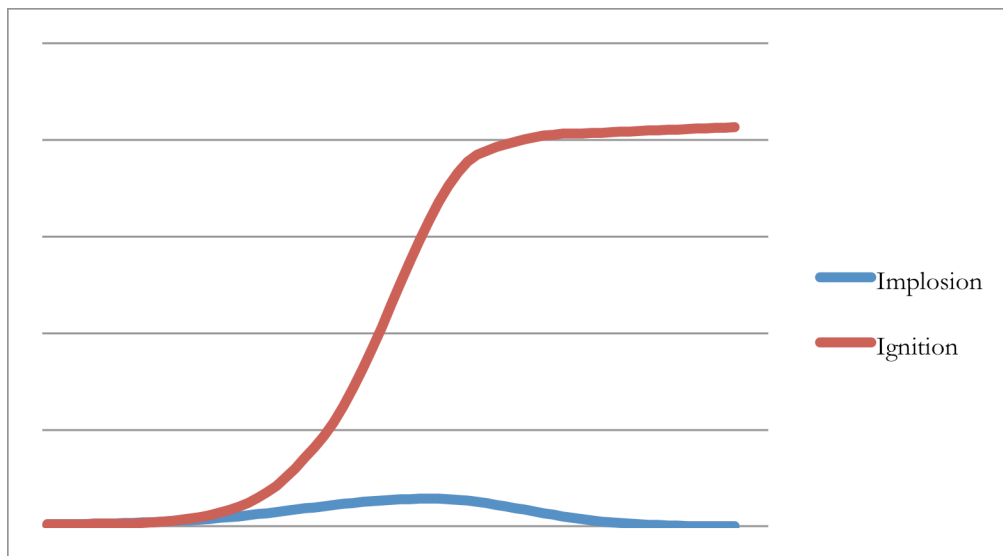
¹ Claire Pénicaut, and Arunjay Katakam, *State of the Industry 2013: Mobile Financial Services for the unbanked*. GSMA 14 (2013). Available at: http://www.gsmamobilefordevelopment.com/wp-content/uploads/2014/02/SOTIR_2013.pdf

² The economics of two-sided platforms was first presented in a pioneering paper by Jean-Charles Rochet and Jean Tirole, *Platform Competition in Two-Sided Markets* 1(4) EUROPEAN ECONOMIC JOURNAL (2003).

The empirical analysis relies heavily on two related concepts from the multi-sided platform literature—ignition and critical mass.³ Platforms typically grow slowly at first until they obtain enough participants (“critical mass”) at which point begin to grow explosively (“ignite”). Platforms that do not reach critical mass soon enough in their lives typically sputter and eventually fail. Figure 1 illustrates typical paths for ignition and implosion.

For each of the countries we collected information from diverse sources on the penetration of mobile money schemes. We examined the percent of adults that had a mobile money account, had used that account recently, and had used mobile money either with their own account or at an agent. We also considered mobile money transactions as a percent of GDP. We assembled this information over time. To

Figure 1. Ignition and Implosion



compare the evolution of mobile money schemes in these countries we identified when mobile money schemes first started, took that as the birth of the mobile money ecosystem, and then compared countries at similar ages for the mobile money ecosystem.

Using the best information available we then made a determination as to how successful mobile money schemes were in the country. After examining the data we classified countries into four categories: those that ignited and had explosive growth; those that had ignited but with slower growth; those that had failed; and those that were so early in their evolution that it was not possible to make a determination. Our classifications were judgmental because data were not available consistently across countries. However, in most cases the data left little doubt as to what category the country fell into to. The successes and failures were obvious.

Table 1 summarizes our findings on ignition or not. Of the 22 countries we concluded that 8 have ignited strongly; 3 have ignited but weakly so; and 8 have sputtered. It is still too soon for us to make a call in

³ David S. Evans, *How Catalyst Ignite: The Economics of Platform-Based Start-Ups*, in PLATFORM, MARKETS AND INNOVATION, (Annabelle Gawer, ed. 2009). Available at SSRN: http://papers.ssrn.com/sol3/papers.cfm?abstract_id=1279631 and David S. Evans and Richard Schmalensee, *Failure to Launch: Critical Mass in Platform Businesses*. 9(4) REVIEW OF NETWORK ECONOMICS (2010). Available at: <http://www.degruyter.com/view/j/rnc.2010.9.4/rnc.2010.9.4.1256/rnc.2010.9.4.1256.xml>

2 countries and there are no bases to determine ignition for 1 country. Seven of the 8 countries that had ignition with explosive growth were located in Africa. Mobile money schemes in 4 other countries on that continent have failed including Nigeria, the largest and most populous African nation, and South Africa, the wealthiest African country.

Table 1. Mobile Money Scheme Successes and Failures

Ignition with Explosive Growth	Ignition with Weak Growth	Failed to Ignite	Too Soon to Assess Ignition	No Basis
Bangladesh	Ghana	Burkina Faso	Democratic Republic of the Congo	Paraguay
Cote D'Ivoire	Philippines	Haiti	Sri Lanka	
Kenya	Pakistan	India		
Rwanda		Indonesia		
Somaliland		Madagascar		
Tanzania		Mexico		
Uganda		Nigeria		
Zimbabwe		South Africa		

Based on a detailed investigation into the similarities and differences between these countries and across the categories we reached several key findings. The first finding is the most robust and important.

- (1) **Heavy regulation is usually fatal to igniting mobile money schemes in a country.** The key difference between the countries that clearly succeeded and clearly failed is stark. All but one of the eight countries that ignited and grew explosively had relatively light regulation on mobile money schemes. Only one of those required the mobile money schemes involve a bank for anything other than just hold funds. Seven of the countries imposed minimal limitations on who could operate a mobile money scheme and all generally had relatively light KYC requirements and minimal restrictions on who could serve as an agent. All but one of the eight countries that have failed to ignite had relatively heavy regulation on mobile money schemes. They required that banks take the lead role in operating the mobile money scheme and conversely prohibited mobile network operators from doing so. They then typically imposed other heavy burdens including stringent KYC requirements and restrictions on who could operate as an agent.
- (2) **Mobile money schemes are more likely to succeed in poorer countries that lack basic infrastructure and where mobile money schemes therefore create more value by reducing a greater friction.**⁴ Poorer countries are more likely to have successful mobile money schemes. Median per capita GDP is US\$1,007 for the countries

⁴ We do not have enough data to distinguish the contribution of poor infrastructure from light regulation. It is possible, for example, that countries that are more desperate for a financial service solution are more willing to try a light regulatory regime figuring they have little to lose.

in which mobile money schemes have ignited with explosive growth, US\$1,871 for the countries in which mobile money schemes have ignited with slow growth, and US\$2,296 for the countries in which mobile money schemes have not ignited. The countries where mobile money schemes ignited have limited transportation and banking systems.

- (3) **The growth of the send-receive and CICO platform must go hand in hand.** The density of the CICO network and the success of the send-receive platform are highly correlated across these countries. The median density for the countries that ignited with fast growth is 27.6 agents per 10,000 adults, compared with 9.5 for the countries that ignited with slow growth, and 2.7 for the countries that have not ignited. The simple correlation between active mobile subscribers per capita and agents per 10,000 adults is 0.79.
- (4) **Ignition and explosive growth occurs quickly or not at all.** Based on our qualitative assessment of when ignition occurred, for the countries with ignition and explosive growth the median time to ignition was 17 months and the longest time was in Tanzania with ignition between 36 and 48 months, and for the countries with ignition and slower growth the median time to ignition was 16 months and the longest time was between 36 and 48 months. By contrast, mobile money schemes have been in existence in countries in which none have ignited for a median of 63 months with the longest 122 months.

II. Ignition and Growth for Multi-Sided Platforms

Economists define a “two-sided platform” as an entity that (a) enables members of two distinct groups; (b) that “need” each other to secure value for themselves; (c) to get together; and (d) engage in mutually beneficial exchange. They typically have positive feedback effects in the sense that members of one group value the platform more if they can interact with more members of the other group, and vice versa.⁵

The very feature, however, that enables platform businesses to create significant value—getting trading partners together—also makes it very difficult to create a successful platform business. To create any value at all these platforms need to attract both sides. Buyers wouldn’t bother with an online shopping site that didn’t have many sellers and sellers wouldn’t bother with a reservation platform that didn’t have many buyers. Platforms need to solve what economists call a “demand coordination problem” and what business writers often refer to as the “chicken-and-egg problem.”

It turns out that platform ignition, demand coordination, and value-creation, are closely related.⁶ The ability of a platform to create value ultimately determines whether it can attract participants to its platform and ultimately earn return on its investment and risk. The platform can secure ignition only if it attracts enough participants for them to obtain enough value to want to participate in the platform. It can succeed in tracking enough participants only if it can solve the demand coordination problem. Whether the platform can create a profitable return on the investment and risk it takes on in turn depends not only on whether the

⁵ Symmetric positive feedback effects are not, however, a necessary condition for a business to be a platform. For example, advertising-support media are two-sided platforms and in some cases consumers dislike the advertisements.

⁶ See DAVID S. EVANS, AND RICHARD SCHMALENSEE, CATALYST CODE: THE STRATEGIES BEHIND THE WORLD’S MOST DYNAMIC COMPANIES. (Harvard Business School Press, 2007).

platform is capable of creating significant value through removing frictions, but also on whether the platform can solve the related demand-coordination and ignition problems that are predicates to creating a viable platform.

Successful platforms follow a typical pattern: they grow slowly at first; they then reach an inflection point; and they grow explosively after passing through that inflection point. Economists have studied what's behind these patterns.⁷ Simply put, platforms face a “critical mass” problem similar to nuclear fission. When a platform starts it will typically get some early adopters who try it out just because they like to try new things or perhaps because they have a particular need that the platform can meet. If the platform enables these early adopters to generate value others will see that and join as well. As they do, the early adopters are more likely to stay with the platform because its value increases as they get to interact with more newcomers. If the growth of participants is slow, however, the earlier adopters will lose interest and drop off the platform. As more desert, however, the value declines to new participants. To be successful, a platform usually needs to grow rapidly enough to maintain current interest and attract new interest.

Platforms may reach a point of “critical mass” at which the value of existing participants is so great that it attracts new participants at a significantly higher rate than it loses current participants. After this point is reached the platform will typically grow explosively because, as a result of positive feedback effects, more participants enable the platform to create more value which attracts more participants which makes the platform even more valuable. This is the point of “inflection.”

Of course platforms may struggle to reach critical mass. In that case the platform will get to a point where more early adopters leave the platform than new adopters join. As a result, the value of the platform declines. But as the value declines there is even less of an incentive for new adopters to join. Positive feedback effects work in reverse. The platform fizzles (enters slow decline) or implodes (fast decline).

III. Data Collection Ignition and Growth for Mobile Money Schemes

Data on the success of mobile money schemes is scarce and spotty. There is no centralized source of data that tracks mobile money transactions across countries and over time. Given the availability of information, our analysis of success and failure required us to conduct research to develop data and information for each country considered. To manage this task we chose 22 developing countries in which mobile money schemes were introduced and for which there would likely be data on their growth. We chose the 22 countries to ensure that we would have, based on preliminary research, countries in which mobile money schemes succeeded and countries in which they did not so that we could delve into the sources of success and failure. As a result of our subsequent analysis we ended up classifying these countries into four categories:

Table 2 lists the 22 countries and some basic details on them. There is great socioeconomic diversity among these countries even though most are developing countries and none are developed. Paraguay, with 6.8 million people is the smallest, and India with 1.3 billion people is the largest. While none are rich, per capita GDP varies from a low of \$388 per capita in the Democratic Republic of the Congo to \$10,650 in

⁷ David S. Evans, *How Catalyst Ignite: The Economics of Platform-Based Start-Ups*, in PLATFORM, MARKETS AND INNOVATION, (Annabelle Gawer, ed. 2009). Available at SSRN: http://papers.ssrn.com/sol3/papers.cfm?abstract_id=1279631 and David S. Evans and Richard Schmalensee, *Failure to Launch: Critical Mass in Platform Businesses*. 9(4) REVIEW OF NETWORK ECONOMICS (2010). Available at: <http://www.degruyter.com/view/j/rnc.2010.9.4/rnc.2010.9.4.1256/rnc.2010.9.4.1256.xml>

Mexico. Mobile phones are prevalent in all of them with the lowest penetration, 36 percent of people, in Madagascar. Less than half of adults have a bank account in all but two of the countries. There are fewer than 10 bank branches per 100,000 adults in 18 of the 22 countries.

For each of these countries we collected information from diverse sources on the penetration of mobile money schemes. We examined the percent of adults that had a mobile money account, had used that account recently, and had used mobile money either with their own account or at an agent. We also considered mobile money transactions as a percent of GDP. We also collected data on the extent of the CICO network since that is an integral part of any mobile money scheme. We assembled this information over time. To compare the evolution of mobile money schemes in these countries we identified when mobile money schemes first started in the country to determine the birth of the mobile money ecosystem and then compared countries at similar ages when possible.

Using the best information available we then made a determination as to how successful mobile money schemes were in the country. After examining the data we classified countries into four categories: those that ignited and had explosive growth; those that had ignited but with slower growth; those that had failed; and those that were so early in their evolution that it was not possible to make a determination. Our classifications were judgmental because data were not available consistently across countries. However, in most cases the data left little doubt as to what category the country fell into to. The successes and failures were obvious in most cases.

Table 2. Socioeconomic Data on Countries Selected for Analysis

Country	Population ⁸	GDP per capita (current US\$ of 2013) ⁹	Mobile Phone Subscriptions per Capita ¹⁰	Commercial Bank Branches per 100,000 Adults ¹¹	Bank Account Penetration (% of adults) ¹²
Bangladesh	156,594,962	1,033	0.67	8.1	39.6
Burkina Faso	16,934,839	711	0.66	-	13.4
Cote d'Ivoire	20,316,086	1,332	0.95	4.6	
Congo, Dem. Rep.	67,513,677	388	0.44	0.7	3.7
Ghana	25,904,598	1,871	1.08	5.7	29.4
Haiti	10,317,461	820	0.69	2.7	22.0
India	1,252,139,596	1,509	0.71	11.4	35.2
Indonesia	249,865,631	3,510	1.22	9.6	19.6

⁸ *Population, total*, World Bank (2013). Available at: <http://data.worldbank.org/indicator/SP.POP.TOTL>.

⁹ *GDP per capita (current US\$)*, International Monetary Fund (2013). Available at: <http://www.imf.org/external/pubs/ft/weo/2014/02/weodata/index.aspx>

¹⁰ *Population, total*, World Bank (2013). Available at: <http://data.worldbank.org/indicator/SP.POP.TOTL> and *Mobile Cellular subscriptions*, World Bank (2013). Available at: <http://data.worldbank.org/indicator/IT.CEL.SETS>

¹¹ *Commercial bank branches (per 100,000 adults)*, World Bank (2012). Available at: <http://data.worldbank.org/indicator/FB.CBK.BRCH.P5>

¹² *Account at a formal financial institution (% age 15+)*, World Bank Findex (2011). Available at: <http://datatopics.worldbank.org/financialinclusion/>

Country	Population ⁸	GDP per capita (current US\$ of 2013) ⁹	Mobile Phone Subscriptions per Capita ¹⁰	Commercial Bank Branches per 100,000 Adults ¹¹	Bank Account Penetration (% of adults) ¹²
Kenya	44,353,691	1,316	0.71	5.5	42.3
Madagascar	22,924,851	463	0.36	1.7	5.5
Mexico	122,332,399	10,650	0.86	14.5	27.4
Nigeria	173,615,345	3,082	0.73	5.8	29.7
Pakistan	182,142,594	1,275	0.70	9.0	10.3
Paraguay	6,802,295	4,281	1.04	9.7	21.7
Philippines	98,393,574	2,791	1.05	8.1	26.6
Rwanda	11,776,522	704	0.57	7.6	32.8
Somalia ¹³	10,495,583		0.49	-	31.0
South Africa	52,981,991	6,621	1.47	10.4	53.6
Sri Lanka	20,483,000	3,204	0.99	17.5	68.5
Tanzania	49,253,126	719	0.56	2.2	17.3
Uganda	37,578,876	623	0.44	2.6	20.5
Zimbabwe	14,149,648	1,007	0.96	7.1	39.7

To assess factors that could lead to success or failure we collected information on several aspects of the mobile money scheme that is based on the research discussed in part in the previous section and that could be relevant to the success of the schemes in a country.

- The regulatory framework: The regulatory framework adopted by the government, in particular, the extent to which regulations restrict potential players, in particular mobile network operators (MNOs), from operating mobile money schemes and the extent to which regulations impose obligations, such as interoperability, on the schemes that could facilitate or restrain success.
- The market structure: The market structure that evolved including the types of players, such as banks, MNO, and neither; the relationship between the scheme leader and the banks and MNO (both of which are usually necessary components); how the CICO network is organized; and the extent to which the market is fragmented among multiple players; and how multiple players work with each other, if at all.

¹³ The country under analysis in this study is Somaliland, which separate from Somalia, but it is not still recognized by the international community as a country, so there is not official information about it. We use Somalia as an approximation.

- The products offered and used: The products that the mobile schemes offer (send-receive, bill pay, and so forth), the extent to which people use these various products, and the extent to which the products solve significant transaction cost problems for people in the country.

IV. Statistical Overview of the Success and Failure of Mobile Money Schemes

We begin the analysis by reporting metrics of success. Table 3 lists the countries in alphabetical order along with the year in which mobile money schemes started in that country. For each country it reports the most recent available data on the percent of registered subscribers; the percent of active subscribers; the percent of adult users; and transactions as a percent of GDP. Most countries do not have all of these measures available. Since these data are not available for most years for most countries we have reported the most recent data for the country. Table 3 presents the core empirical findings on success or failure that provide the foundation for the remainder of the analysis.

To help interpret the data, and compare the success of countries, after each of these success metrics we show in parentheses the number of years since the start of mobile money that has elapsed since the date of the metric. For example, in the case of Rwanda we find that 53 percent of mobile phone users were registered mobile money subscribers 4 years after the launch of the first MMP; 59.4 percent of the adult population were registered users after 4 years; 25.4 percent of mobile phone subscribers were active users of mobile money services after 3 years; mobile money amounted to 2.6 percent of GDP after 3 years; and there were 21.2 agents for per 10,000 adults 4 years after the start of the first MMP.

It is clear, of course, that mobile schemes in Kenya have succeeded and that those in Madagascar have not so far. However, the extent to which mobile money schemes are succeeding is less apparent in many other countries given the inconsistency in the data for these countries, particularly at a similar time in their evolutions. We have combined the data shown in the table with information from other sources to reach a determination for each country. That finding is shown in the last column of the table. Appendix A presents more details on why we have made each of these judgments based on a combination of the available hard data and anecdotal information.¹⁴ Of the 22 countries we conclude that 8 have ignited strongly; 3 have ignited but weakly so; 8 have sputtered. It is still too soon for us to make a call in 2 countries and there are no bases to determine ignition for 1 country.

We now turn to a series of qualitative assessments designed to identify possible factors behind success and failure. Table 4a-4d list the countries grouped into the four success categories and listed alphabetically within each. For each country, Table 4 describes the regulatory framework, and our judgment on the length of time that it took for mobile money schemes in the country to reach critical mass and ignite, and the density of the CICO network. It also shows the GDP of the country and the GDP rank out of all countries. The methodology on how we measure the length of time it took each scheme to reach critical mass is detailed in Appendix B.

¹⁴ The classification was based on the growth trajectory of mobile payments. Although we had to rely on different measures of this trajectory depending on data availability the trajectories generally provided an unambiguous classification into the four categories described above.

Table 3. Current State of Mobile Money Deployments in Countries under Analysis¹⁵

Country	Launch of First MMP	Registered Users as Percent of Mobile Phone Users	Active Users as Percent of Mobile Phone Users	Registered Users as Percent of Adult Population	Transactions as Percent of GDP	Agents per 10,000 adults	Evaluation of Success
Bangladesh ¹⁶	Mar-11	22.2% (3)	10.5% (3)	22.8% (3)	1% (2)	50.83 (3)	Explosive Ignition
Burkina Faso ¹⁷	Dec-08	0.8% (2)		0.7% (2)			Failed
Cote D' Ivoire ¹⁸	Dec-08	31.8% (5)	10.9% (5)	54.7% (5)	7.9% (5)	10.73 (5)	Explosive Ignition
Democratic Republic of Congo ¹⁹	Feb-12	9.5% (1)	1.3% (1)	7.5% (1)	0.8% (1)	8.81 (1)	Too soon to tell
Ghana ²⁰	Jun-09	19.3% (5)		35.9% (5)			Weak Ignition
Haiti ²¹	Feb-11	9.8% (2)	0.8% (4)	10.4% (2)		2.16 (1)	Failed
India ²²	Nov-07		1.0% (6)			1.83 (6)	Failed
Indonesia ²³	Nov-07	7.9% (6)	1.2% (4)	14.5% (6)			Failed
Kenya ²⁴	Mar-07	83.7% (7)	39.9% (7)	102.2% (7)	49.3% (6)	48.46 (7)	Explosive Ignition
Madagascar ²⁵	Jun-10	20.6% (3)	1.7% (3)	12.9% (3)		3.43 (3)	Failed

¹⁵ *Mobile Cellular Subscriptions*, World Bank (2013). Available at: <http://data.worldbank.org/indicator/IT.CEL.SETS>; *Population ages 15-64 (% of total)*, World Bank (2013). Available at: <http://data.worldbank.org/indicator/SP.POP.1564.TO.ZS>; *Population ages 65 and above (% of total)*, World Bank (2013). Available at: <http://data.worldbank.org/indicator/SP.POP.65UP.TO.ZS>; *Population, total*, World Bank (2013). Available at: <http://data.worldbank.org/indicator/SP.POP.TOTL> and *MMU Deployment Tracker*, GSMA. Available at: <http://www.gsma.com/mobilefordevelopment/programmes/mobile-money-for-the-unbanked/insights/tracker>

¹⁶ *Mobile Financial Services (MFS) comparative summary statement of October, 2014 and November 2014*, CENTRAL BANK OF BANGLADESH. Available at: http://www.bangladesh-bank.org/fnansys/paymentsys/20141218_mfs.pdf

¹⁷ INOVA: A Home Grown Mobile Money service in West Africa, UNDP (2011). Available at: <http://www.undp.org/content/dam/undp/library/corporate/Partnerships/Private%20Sector/AFIMcases/UNDP%20GIM%20Case%20Study%20Inova%20Final.pdf>

¹⁸ *Overview of Cote D'Ivoire: Mobile Financial Services Market Data 2013*, IFC (2013). Available at: http://www.ifc.org/wps/wcm/connect/60efa900461a20518634bf9916182e35/ifc_emoney_english.pdf?MOD=AJPERES

¹⁹ Simone Di Castri, *Enabling Mobile Money Policies in the Democratic Republic of Congo*, GSMA (2014). Available at: <http://www.gsma.com/mobilefordevelopment/wp-content/uploads/2014/04/Enabling-Mobile-Money-Policies-in-the-Democratic-Republic-Of-Congo.pdf>. There is additional data from IMF FAS that presents that there are 8,126,599 registered users, 1,076,653 active users and 1,293 active agents in the country by the end of 2013. Both sources use data from Banque Centrale du Congo, but we decided to use GSMA data, since IMF FAS data presented inconsistencies in the number of agents according to the level of development of mobile money deployments.

²⁰ Yaw Owusu-Agyeman and Abena Offe, *Mobile Money Payments in Ghana: Part Two, Public Intervention*, IMTFI, April 7, 2014. Available at: <http://blog.imtffi.uci.edu/2014/04/mobile-money-payments-in-ghana-part-two.html>

²¹ Erik Heinrich, *Haiti's Mobile Redemption*, FORTUNE, August 15, 2013. Available at: <http://fortune.com/2013/08/15/haitis-mobile-redemption/> and Ángel González, *Push to Make Haiti an e-cash Economy Fell Far Short*, THE SEATTLE TIMES, January 10, 2015. Available at: <http://seattletimes.com/flatpages/nationworld/haiti-shaky-recovery-part-2-earthquake-five-years-later-annivers.html>

²² Data corresponds to only one of the active MMPs in the country, which is called Money-on-Mobile (MoM). Data for the rest of the MMPs is very outdated. Therefore information presented understates the total subscribers of mobile money in deployments in India. *India Could Surpass Kenya in Mobile Money Market: Clocked 67.5 Million Unique Users By August 2013*, DAZINFO, September 17, 2013. Available at: <http://dazeinfo.com/2013/09/17/india-surpass-kenya-mobile-money-market-clocked-67-5-million-unique-users-august-2013/> and *Calpian Steady Domestic Cashflow + Money on Mobile Explosive International Growth*, SEC. Available at: http://www.sec.gov/Archives/edgar/data/1414628/000135448813005155/clpi_ex991.htm

²³ *Accelerating Mobile Money in Indonesia: Opportunity Assessment*, USAID (2011). Available at: http://egateg.usaid.gov/sites/default/files/D1.%20FS%20Share_Opportunity_Assessment_Final.pdf and *Financial Access Survey*, INTERNATIONAL MONETARY FUND. Available at: <http://fas.imf.org/Default.aspx>

²⁴ *Payments System Statistics: Mobile Payments*, Central Bank of Kenya. Available at: <https://www.centralbank.go.ke/index.php/nps-modernization/mobile-payments> and Brian Muthiora, *New Infographic: Mobile Money and the Digitisation of Kenya's Retail Payments Systems*, GSMA, September 29, 2014. Available at: <http://www.gsma.com/mobilefordevelopment/new-infographic-mobile-money-and-the-digitisation-of-kenyas-retail-payments-systems>.

²⁵ Corinne Riquet, *Small Farmers, Mobile Banking, Financial Inclusion in Madagascar*, CGAP, October 28, 2013. Available at: <http://www.cgap.org/blog/small-farmers-mobile-banking-financial-inclusion-madagascar> and *Financial Access Survey*, INTERNATIONAL MONETARY FUND. Available at: <http://fas.imf.org/Default.aspx>

Country	Launch of First MMP	Registered Users as Percent of Mobile Phone Users	Active Users as Percent of Mobile Phone Users	Registered Users as Percent of Adult Population	Transactions as Percent of GDP	Agents per 10,000 adults	Evaluation of Success
Mexico ²⁶	Jan-12	2.6% (1)		3.4% (1)		3.26 (1)	Failed
Nigeria ²⁷	Feb-11	5.4% (2)	0.3% (2)	7.5% (2)		3.65 (2)	Failed
Pakistan ²⁸	Oct-09	3.3% (5)	1.5% (5)	3.7% (5)	5.1% (4)	14.98 (5)	Weak Ignition
Paraguay ²⁹	Jul-10		0.9% (2)				Insufficient Info ³⁰
Philippines ³¹	Oct-04	7.8% (9)	5.2% (9)	13.2% (9)	2% (5)	3.94 (9)	Weak Ignition
Rwanda ³²	Feb-10	53.0% (4)	25.4% (3)	59.4% (4)	2.6% (3)	21.22 (4)	Explosive Ignition
Somaliland ³³	Jun-09	33.1% (4)	24.2% (4)				Explosive Ignition
South Africa ³⁴	Nov-04	3.5% (8)	0.3% (8)	7.3% (8)		1.06 (8)	Failed
Sri Lanka ³⁵	Jun-12	4.9% (1)	1.0% (1)	7.4% (1)	0.1% (1)	11.40 (1)	Too soon to tell
Tanzania ³⁶	Apr-08	115.9% (5)	40.1% (5)	117.1% (5)	53.3% (5)	56.46 (5)	Explosive Ignition
Uganda ³⁷	Mar-09	106.2% (5)	9% (3)	90.8% (5)	39.7% (5)	27.62 (4)	Explosive Ignition
Zimbabwe ³⁸	Sep-11	30.1% (2)	19.5% (2)	47.9% (2)	22% (1)	8.05 (2)	Explosive Ignition

²⁶ *Financial Access Survey*, INTERNATIONAL MONETARY FUND. Available at: <http://fas.imf.org/Default.aspx>

²⁷ Interviews from McKinsey, November 2013 and *Financial Access Survey*, INTERNATIONAL MONETARY FUND. Available at: <http://fas.imf.org/Default.aspx>

²⁸ *Quarterly Branchless Banking Newsletter Apr-Jun 2014*, STATE BANK OF PAKISTAN, July 2014. Available at: <http://www.sbp.org.pk/publications/acd/BranchlessBanking-Apr-Jun-2014.pdf>

²⁹ Camilo Tellez and M. Yasmina McCarty, *Mobile Money in Latin America: A Case Study of Tigo Paraguay*, GSMA (2012). Available at: <http://www.gsma.com/mobilefordevelopment/wp-content/uploads/2012/03/tigopyenfinal.pdf>

³⁰ There is very little information available. A report from GSMA in 2012 presented hard data on number of subscribers, but the evolution since then is uncertain. (Camilo Tellez and M. Yasmina McCarty, *Mobile Money in Latin America: A Case Study of Tigo Paraguay*, GSMA (2012). Available at: <http://www.gsma.com/mobilefordevelopment/wp-content/uploads/2012/03/tigopyenfinal.pdf>

³¹ *Financial Access Survey*, INTERNATIONAL MONETARY FUND. Available at: <http://fas.imf.org/Default.aspx>

³² *Annual Report 2013-2014*, NATIONAL BANK OF RWANDA (2014). Available at: http://www.bnr.rw/index.php?id=231&eID=dam_frontend_push&docID=1216

³³ Claire Pénicaut and Fionán McGrath, *Innovative Inclusion: How Telesom ZAAD Brought Mobile Money to Somaliland*, GSMA (2013). Available at: <http://www.gsma.com/mobilefordevelopment/wp-content/uploads/2013/07/Telesom-Somaliland.pdf>

³⁴ Rajiv Bhatia, *Mobile Money Success in South Africa Requires Telco, Bank Tie-Ups*, ERICSSON CALL FOR CHANGE BLOG, August 1, 2014. Available at: <http://www.ericsson.com/m-commerce/blog/mobile-money-success-south-africa-requires-telco-bank-tie-ups>, WIZZIT, BUSINESS CALL TO ACTION. Available at: <http://www.businesscalltoaction.org/members/2011/11/wizzit/> and *Financial Access Survey*, INTERNATIONAL MONETARY FUND. Available at: <http://fas.imf.org/Default.aspx>

³⁵ Simone Di Castri, *Enabling Mobile Money Policies in Sri Lanka: The Rise of eZ Cash*, GSMA (2013). Available at: <http://www.gsma.com/mobilefordevelopment/wp-content/uploads/2013/09/Enabling-Mobile-Money-Policies-in-Sri-Lanka-GSMA-MMU-Case-Study-July2013.pdf>

³⁶ Simone Di Castri and Lara Gidvani, *Enabling Mobile Money Policies in Tanzania: A test and learn approach to enabling market-led digital financial services*, GSMA (2014). Available at: <http://www.gsma.com/mobilefordevelopment/wp-content/uploads/2014/03/Tanzania-Enabling-Mobile-Money-Policies.pdf>

³⁷ Martin Luther Oketch, *Registered Mobile Money users Reach 17 Million Mark*, DAILY MONITOR, August 8, 2014. Available at: <http://www.monitor.co.ug/Business/Registered-mobile-money-users-reach-17-million-mark/-/688322/2411528/-/rjcg2z/-/index.html>, Uganda Mobile Money Assessment and Case Study, USAID (2012). Available at: http://solutionscenter.nethope.org/assets/collaterals/Uganda_Market_Assessment_and_Case_Studies_Final.pdf and *Financial Access Survey*, INTERNATIONAL MONETARY FUND. Available at: <http://fas.imf.org/Default.aspx>

³⁸ *4.2m use EcoCash*, WEEKENDPOST, June 27, 2014. Available at: <http://www.weekendpost.co.zw/articles/2014/06/27/4-2m-use-ecocash>, Phil Levin, *Big Ambition Meets Effective Execution: How EcoCash is Altering Zimbabwe's Financial Landscape*, GSMA (2013). Available at: <http://www.gsma.com/mobilefordevelopment/wp-content/uploads/2013/07/EcoCash-Zimbabwe.pdf> and *Financial Access Survey*, INTERNATIONAL MONETARY FUND. Available at: <http://fas.imf.org/Default.aspx>

Table 4a. Countries that Have Ignited Strongly

Country	Regulatory Framework			GDP (millions of current US\$ 2013)	GDP Rank	Length to Reach Critical Mass	Agents per 10,000 adults	Agents per 100 Km ²
	Has specific mobile money regulation?	Allows Non-Banks to issue mobile money?	Has KYC Requirements? Tiered KYC?					
Bangladesh	Guideline on Mobile Financial Services for the Banks, 2011	Bank-led model only	Each mobile money account must have all the requirement documents (KYC form). No KYC Tiers. Banks shall follow a full KYC format issued by the AML Department.	161,763	59	Between 13 and 26 months	50.83 (3)	398.8 (3)
Cote D'Ivoire	Regulation of Electronic Money of BCEAO	It is allowed, but in practice, MNOs participating in the market (MTN and Orange), both have entered in partnerships with Banks.	To be identified, customers should sign a form, provide a copy of ID and a proof of address. Different services for identified and unidentified customers. Identified customers can open e-wallet with maximum balance of \$600. Unidentified customers can open e-wallet with maximum balance of \$200.	32,061	94	45 months	10.73 (5)	3.8 (5)
Kenya	E-Money Regulations. Central Bank of Kenya, 2013	Banks and non-banks can issue electronic money. Non banks shall comply with certain conditions	No KYC tiers. Full KYC registration only. Customers can register at agent's stores.	54,993	77	11 months	48.86 (7)	21.82 (7)
Rwanda	Branchless Banking Guidelines	There are non-banks participating in the market. No specific regulation about it	No KYC tiers. Full KYC registration only. Customers can register using any ID.	7,601	142	Between 29 and 35 months	21.22 (4)	55.42 (4)
Somaliland	✗	Allowed of MMPs in practice, not stated in regulation	Compliance by MMPs in practice, not by regulation. No basis.	-	-	Between 13 and 15 months		6.25 (4)
Tanzania	Electronic Payment Schemes Guidelines	Banks and non-banks are allowed to apply for a electronic payment scheme license.	No KYC tiers. Full KYC registration only. Customers can register using any ID with a photograph.	33,285	92	Between 36 and 42 months	56.46 (5)	17.31 (5)
Uganda	Bank of Uganda Mobile Money Guidelines.	Non-banks shall partner with a financial institution in order to be able to issue mobile money.	No KYC tiers. Full KYC registration only. Customers can register using any ID with a photograph.	22,926	104	10 months	27.62 (4)	6.05 (4)
Zimbabwe	✗	Allowed in practice, not stated in regulation	No basis.	13,206	124	2 months	8.05 (2)	1.78 (2)

Table 4b. Countries that Have Sputtered

Country	Regulatory Framework				GDP (millions current US\$ 2013)	GDP Rank	Months since beginning	Agents per 10,000 adults	Agents per 100 Km ²
	Has specific Money Regulation?	Mobile	Allow Non-Banks to Issue Mobile Money?	Has KYC Requirements? Tiered KYC					
Burkina Faso	Regulation of Electronic Money of BCEAO.		It is allowed as a non-banking model, by which electronic money issuer institutions are authorized by Central Bank. In practice Airtel Money have entered with a partnership with Ecobank.	No basis.	12,042	127	72 months since launch		
Haiti	Lignes Directrices relatives à la Banque à Distance (Guidelines of Branchless Banking)		MNO cannot independently brand new services. Bank led model only.	Different types of KYC tiers with different requirements each. Mini-wallet with a transaction limit of \$63 for T-Cash and \$101 for TchoTcho. Full wallet with transaction limit of \$ 252	8,482	138	47 months since launch	2.16 (1)	5.15 (1)
India	Mobile Payments in India – Operative Guidelines for Banks, 2008		Bank led model only.	No tiered KYC. Full KYC compliance ensured by banks. ³⁹	1,876,811	10	86 months since launch	1.83 (6)	5.05 (6)
Indonesia	Bank Indonesia Regulation 11/12/PBI/2009 Concerning Electronic Money		Bank or non-bank institutions can issue electronic money with the grant of a license from Central Bank.	Banks cannot outsource KYC procedures. For non banks are costly and non-feasible. No tiered KYC. Full KYC compliance. ⁴⁰	870,275	16	86 months after launch		
Madagascar		x	Non-banks should have an exclusive partnership with a bank to operate.	No basis	10,645	133	54 months after launch	3.43 (3)	0.78 (3)
Mexico		x	The “Niche Bank” system encourages non-banks to offer financial services. The role of MNOs is limited by law.	Not very restrictive identification of customers to open an account. No tiered KYC. Full KYC compliance ensured by banks.	1,260,915	15	36 months since launch	3.26 (1)	1.33 (1)
Nigeria	Regulatory Framework for Mobile Payments in Nigeria		Non-banks are allowed to issue mobile money, except telecommunications providers.	Three tiered KYC requirements. Low-value account limited to maximum single deposit amount of \$ 123, up to a cumulative maximum of \$ 1231. Medium value accounts limited to \$ 308 and \$2463 respectively. High value	521,812	23	47 months since launch	3.65 (2)	3.68 (2)

³⁹ *Mobile Payments in India – Operative Guidelines for Banks*, Reserve Bank of India. Available at: <http://rbidocs.rbi.org.in/rdocs/Content/PDFs/84978.pdf>

⁴⁰ *Update on Regulation of Branchless Banking in Indonesia*, CGAP (2010), <https://www.cgap.org/sites/default/files/CGAP-Regulation-of-Branchless-Banking-in-Indonesia-Jan-2010.pdf>

Country	Regulatory Framework						GDP (millions current US\$ 2013)	GDP Rank	Months since beginning	Agents per 10,000 adults	Agents per 100 Km ²
	Has specific Money Regulation?	Mobile	Allow Non-Banks to Issue Mobile Money?	Has KYC Requirements?	to Issue	Has Tiered KYC					
South Africa	Position Paper Money. Position Paper NPS 01/2006	Electronic		Bank led model		Three requirements. Low value account opening and low documentary standards. Medium value account that allows low documentary standards. High value accounts with full KYC requirements.	350,800	33	122 months since launch	1.05 (8)	0.32 (8)

⁴¹ Kingsley Ighomwenghian, *Three-Tiered KYC: CBN Confident on Achieving 2020 Financial Inclusion Target*, DAILY INDEPENDENT. Available at: <http://dailyindependentnig.com/2014/05/three-tiered-kyc-cbn-confident-achieving-2020-financial-inclusion-target/>

Table 4c. Countries That Have Ignited But Weakly So

Country	Regulatory Framework			GDP (millions current US\$ 2013)	GDP Rank	Length to Reach Critical Mass	Agents per 10,000 adults	Agents per 100 Km ²	
	Has specific Money Regulation?	Mobile No. Regulation?	Allow Non-Banks to Issue Mobile Money?						Has KYC Requirements?
Ghana	Guidelines for Branchless Banking. Notice No. BG/GOV/SEC/2008/21, 2008.		Bank-led model	KYC due diligence must be undertaken on all new accounts and one-off cash transactions. No tiered KYC requirements	47,830	82	Between 0 and 25 months		
Pakistan	Branchless Banking Regulation: for Financial Institutions Desirous to Undertake Branchless Banking, 2011		Bank led model	Different KYC requirements to different upper limit of transactions for each type of account. Four tiered KYC requirements. Level 0, basic account with low KYC requirements and transaction limit. Level 1, with adequate KYC requirements and transaction limits. Level 2, top level accounts with full KYC requirements and Level 3, specific limits and KYC requirements for merchants.	232,757	44	Between 36 and 48 months	14.98 (5)	21.87 (5)
Philippines	Circular No. 649. Bangko Sentral Ng Pilipinas, 2009		Electronic money issuers can be classified as (i) bank, (ii) non banks financial institutions and (iii) non banks institutions registered as money transfer agents	Circular No. 608 determines that all types of financial transactions shall comply with KYC standards. Only full KYC requirements. Customers must present an ID only once.	272,067	40	Between 0 and 31 month	3.94 (9)	8.06 (9)

Table 4d. Countries For Which It Is Too Soon To Make A Call

Country	Regulatory Framework			GDP (millions current US\$ 2013)	GDP Rank	Months since Beginning	Agents per 10,000 adults	Agents per 100 Km ²
	Has specific Mobile Money Regulation?	Allow Non-Banks to Issue Mobile Money?	Has KYC Requirements? Tiered KYC					
Democratic Republic of Congo	Directive N° 24 Relative to the issue of electronic money	Banks, other financial institutions and non-banks need a license and can provide mobile money services.	Two tiered KYC requirements. Basic account with a daily limit of \$100 for Vodacom and Tigo and \$200 for Airtel, monthly limit of \$2,500 and maximum balance of \$3,000. Tier two account with daily limit of \$500, monthly limit of \$2,500 and maximum balance of \$3,000.	29.896	97	35 months	8.81 (1)	1.44 (1)
Sri Lanka	Mobile Payments Guidelines No. 1 for the Bank led Mobile Payment Services. Mobile Payment Guidelines No.2 for Custodian Account Based Mobile Payment Services	Under custodian account based system, licensed service providers may issue e-money by accepting physical money from customers / merchants and like this make cash-ins, cash-outs.	Two tiered KYC requirements is implemented in practice by eZ Cash. Dialog Classic Account, with a daily limit of \$80 for P2P transactions and \$80 for utilities, with self-registration as KYC requirement. Dialog Power Account with daily transaction limit of \$40 and \$200 for P2P and utilities transactions, with registration at a Dialog's service point.	66.722	69	31 months	11.40 (1)	24.72 (1)

All but one of the countries that have had ignition and explosive growth have had regulatory regimes in which it was possible for non-banks including MNOs to lead the mobile money schemes. The exception is Bangladesh in which bKash, which is affiliated with a bank, operates a mobile money scheme that works across all MNOs. Two of the countries that have failed to ignite, Haiti and India, have had regulatory regimes in which banks must operate, or lead in the operation of, MMPs. Additionally, in Mexico and Nigeria, the role to be played by MNOs in the development of mobile money is restricted by law and in Indonesia, MNOs can participate but must work with banks for KYC.

Other authors have noted that the bank-led model has not shown much evidence of success in developing countries and our analysis tends to confirm that. Looking across the 22 countries there is only one true success stories for mobile money schemes that have not been lead by MNOs. On the one hand, bKash in Bangladesh is a mobile money scheme sponsored by BRAC Bank. Its mobile money wallet works with the MNOs that account for most subscribers in that country. So far, however, it has been most successful in providing an agent network that people use to pay bills but not in the widespread use of mobile money by people and businesses.

Another success story is led by a bank but with fairly significant involvement by an MNO. Easypaisa in Pakistan is sponsored by Tammer Bank and Telenor Pakistan. The participating MNO has an important role in Easypaisa. Telenor Pakistan owns 51 percent of Tameer Bank and Easypaisa works as a common organization across the two companies. Easypaisa also succeeded in getting a dense agent network and in getting national coverage using exclusively on the GSM distribution structure. An interesting fact is that the two bank-led successes have a large fraction of their transactions made as OTC transactions, which don't need a registered account to be made. OTC transactions account for 85 percent of mobile money transactions both in Bangladesh and Pakistan.⁴²

The density of the CICO network and the success of the send-receive platform are highly correlated across these countries. The median density for the countries that ignited with fast growth is 27.6 agents per 10,000 adults, compared with 9.5 for the countries that ignited with slow growth, and 2.7 for the countries that have not ignited. These statistics should be viewed with caution since they are measured at different points in time in the life cycle of the mobile money schemes.

While these results are interesting it is not possible to draw conclusions concerning causality. It is difficult to recruit agents if there is not enough send and receive activity to support cash-in and cash out transactions from which the agents make money. As a result the CICO network and the send-receive platform must necessarily grow in tandem.

The agent density can be viewed as another measure of whether the system has ignited. The fact that average density for the countries with ignition and explosive growth is about three times that for countries with ignition and slow growth, and about 10 times greater than for countries that have not ignited provides confirmation about our assignment of countries into these categories.

Among the developing countries considered here there is a negative association between the success of mobile money schemes and the degree of economic development measured by per capita GDP. Median per capita GDP is US\$ 1,007 for the countries in which mobile money schemes have

⁴² Greg Chen and Pjal Islam, *Consumer Insights from Bangladesh. Is a Transition to Mobile Wallets Underway?*, CGAP, March 2014. Available at: <http://www.slideshare.net/CGAP/is-a-transition-to-mobile-wallets-underway-in-bangladesh> and Available at: *Quarterly Branchless Banking Newsletter Apr-Jun 2014*, STATE BANK OF PAKISTAN 4 (2014). Available at: <http://www.sbp.org.pk/publications/acd/BranchlessBanking-Apr-Jun-2014.pdf>

ignited with explosive growth, US\$ 1,871 for the countries in which mobile money schemes have ignited with slow growth, and US\$ 2,296 for the countries in which mobile money schemes have not ignited. The most successful countries appear to have the lowest GDP. We explore relationship this more below. All but one of the countries in which mobile money schemes have ignited with explosive growth are relatively small. They have a median population of 29.9 million people and range from 10.5 million to 156.6 million.

It appears that ignition and growth happen quickly or not at all. Based on our qualitative assessment of when ignition occurred, for the countries with ignition and explosive growth the median time to ignition was 17 months and the longest time was in Tanzania with ignition between 36 and 48 months, and for the countries with ignition and slower growth the median time to ignition was 16 months and the longest time was between 36 and 48 months. By contrast, mobile money schemes have been in existence in countries in which none have ignited for a median of 63 months with the longest 122 months.

V. Deep Dive Into the Sources of Success and Failure

To provide a richer understanding of the sources of success and failure we examine each of the groups in more detail. Table 5 (which repeats Table 1 for the convenience of the reader) lists the countries for each of the four categories of success and failure.

Table 5. Mobile Money Scheme Successes and Failures

Ignition with Explosive Growth	Ignition with Weak Growth	Failed to Ignite	Too Soon to Assess Ignition	No Basis
Bangladesh	Ghana	Burkina Faso	Democratic Republic of the Congo	Paraguay
Cote D'Ivoire	Philippines	Haiti	Sri Lanka	
Kenya	Pakistan	India		
Rwanda		Indonesia		
Somaliland		Madagascar		
Tanzania		Mexico		
Uganda		Nigeria		
Zimbabwe		South Africa		

1. Ignition with Explosive Growth

All but one of the countries in which mobile money schemes have ignited and have seen explosive growth are in Africa, and several of those are clustered in a mid-eastern crescent that goes from Somaliland to Zimbabwe. We conjecture that this concentration of the strong successes is the result of the geographic diffusion of the successful methods for starting mobile money schemes that started in Kenya combined with these countries having other features in common. A related factor concerns the experience of the MNOs who have led these efforts. Table 6 lists the African countries we had examined that ignited strongly and identifies the MNO, where applicable, for each system.

Table 6. African Countries that had ignited in the Study and MNOs

Country	MNOs with Deployments in the Country
Cote D'Ivoire	Etisalat, MTN, Orange
Kenya	Airtel, Safaricom, Orange, Essar Telecom
Rwanda	Airtel, MTN and Tigo
Somaliland	Telesom
Tanzania	Airtel, Etisalat, Tigo and Vodacom
Uganda	Airtel, UT Mobile, MTN and Orange
Zimbabwe	Econet, NetOne, Telecel

All of these countries are desperately poor. Based on the 2013 International Monetary Fund (IMF) ranking of 186 countries, with a higher number reflecting a lower rank, they rank between 173 for Uganda and 149 for Kenya. Not surprisingly they have very poor physical infrastructure. Of particular relevance for mobile money, they have extremely low penetration of banking and poor physical transport in terms of road systems and automobiles. Table 7 lists the ranking of these countries based on IMF data on per capita GDP and World Bank data based on gasoline consumption per capita and where available percent of paved roads and on banks per 100,000 adults. What people do have in these countries are mobile phones. For completeness the table shows the number of mobile phone subscribers per capita.

This relationship is consistent with two related hypotheses. On the one hand, people in the poorest countries have a much greater demand for mobile money schemes because their alternatives for sending and receiving money are so poor. The frictions are greatest in these countries. On the other hand, the governments of those countries may choose to impose light regulations, and to allow non-banks to operate mobile money schemes, because they are more desperate for a solution and because there is such a limited banking system to rely on in any event. The data do not allow us to distinguish between these two explanations but both are likely important.

Table 7. Rankings of Infrastructure Characteristics for Explosive Ignition Countries

Country	GDP per capita 2013 (out of 186 countries) ⁴³	Gasoline Consumption per capita (out of 164 countries) ⁴⁴	Roads paved (out of 121 countries) ⁴⁵	Bank branches per 100,000 adults (out of 211 countries) ⁴⁶	Mobile Phone Subscribers per Capita ⁴⁷
Bangladesh	159	162	-	142	0.67
Cote D'Ivoire	147	156	-	170	0.95
Kenya	149	145	120	163	0.71
Rwanda	168	-	-	147	0.57
Somaliland	-	-	-	-	-
Tanzania	166	159	110	198	0.56
Uganda	173	-	-	194	0.44
Zimbabwe	161	151	-	155	0.96

Not surprisingly, airtime top up is one of the major ways in which people use mobile money. Rather than going to a top-up location people can use the funds in their mobile money account to top up their phones. Beyond that the mobile money schemes in these countries have focused on sending and receiving money and solving the friction of moving money between families located in geographically separate regions of the country with a major use case being transferring money between urban and rural areas. Large amounts of domestic remittances are transferred using the mobile phone. In Kenya, Uganda and Tanzania, 90 percent, 68 percent and 60 percent respectively of domestic remittances are made with mobile phones.⁴⁸

In some cases the mobile money schemes have provided other basic financial services on top of this including savings account, lending, and insurance. Based on the anecdotal evidence bill payment is not major use case. Only 6 percent of respondents in a survey of Sub-Saharan countries sent money to pay bills with the mobile phone.⁴⁹ In fact, these are extremely poor countries in which most people would not have regular bills for things like electricity For example, in Kenya, the

⁴³ *Gross Domestic Product per capita*, International Monetary Fund (2013). Available at: <http://www.imf.org/external/pubs/ft/weo/2014/02/weodata/index.aspx>

⁴⁴ There are a total of 164 countries ranked in 2011. *Road Sector Gasoline Fuel Consumption per capita (kg of oil equivalent)*, World Bank (2011). Available at: <http://data.worldbank.org/indicator/IS.ROD.SGAS.PC>

⁴⁵ There are a total of 121 countries ranked in 2011. *Roads, paved (% of total roads)*, World Bank (2011). Available at: <http://data.worldbank.org/indicator/IS.ROD.PAVE.ZS>

⁴⁶ There are a total of 211 countries ranked in 2012. *Commercial Bank Branches (per 100,000 adults)*, World Bank (2012). Available at: <http://data.worldbank.org/indicator/FB.CBK.BRCH.P5>

⁴⁷ *Population, total*, World Bank (2013). Available at: <http://data.worldbank.org/indicator/SP.POP.TOTL>, and *Mobile Cellular Subscriptions*, World Bank (2013). Available at: <http://data.worldbank.org/indicator/IT.CEL.SETS>

⁴⁸ Johanna Godoy, Bob Tortora, Jan Sonnenschein and Jake Kendall, *Payments and Money Transfer Behavior of Sub-Saharan Africans* 23 (2012). Available at SSRN: <http://ssrn.com/abstract=2116449>

⁴⁹ Johanna Godoy, Bob Tortora, Jan Sonnenschein and Jake Kendall, *Payments and Money Transfer Behavior of Sub-Saharan Africans* 39 (2012). Available at SSRN: <http://ssrn.com/abstract=2116449>

wealthiest of these countries and the one with the highest penetration of mobile money subscriptions, only 23 percent of the population has access to electricity.⁵⁰

All but one of the countries in which ignition with explosive growth have occurred have followed the “go light regulatory model” pioneered in Kenya. Table 8 summarizes the regulatory model for each country. MNOs are allowed to start mobile money schemes and there are relatively few restrictions on them. In all cases the leading mobile money schemes in these countries are operated by the MNOs, sometimes in close partnership with the banks. Table 9 lists the major mobile money schemes in each country based on the most recent data available and shows the extent to which they are led by an MNO mainly by itself⁵¹, an MNO in close partnership with a bank, or a bank.

⁵⁰ *Access to Electricity (% of population)*, World Bank (2010). Available at: <http://data.worldbank.org/indicator/EG.ELC.ACCS.ZS>

⁵¹ In almost all cases a bank is responsible for holding funds and perform other traditional banking services for the mobile money operator.

Table 8. Regulatory Model for each country that had explosive ignition

Country	Assessment of Regulatory Framework	General Description
Bangladesh	Moderately heavy restrictions for MNOs to operate.	Regulation mandates a bank led model for mobile financial services. It also enhances the use of MNOs/Solution Providers as branchless agents. Customer accounts will rest with the bank and will be accessible through customers' mobile device. Banks are responsible of protecting the customers.
Cote D'Ivoire	Minimal restrictions for MNOs and other non-banks to enter	E-money issuers can be banks in partnership with MNOs, or a non-bank that has been granted with a specific license by Central Bank
Kenya	Minimal restrictions for MNOs and other non-banks to enter	Every person that is not a bank or financial institution shall make an application to the Central Bank for authorization to operate.
Rwanda	Minimal restrictions for MNOs and other non-banks to enter	MNOs are able to issue mobile money with a license from Central Bank and funds must be held in a bank managed escrow.
Somaliland	No restrictions for MNOs and other non-banks to enter	There is no need for a license to operate and almost no enforcement from the Central Bank. The MNO Telesom was granted with a remittance license.
Tanzania	Minimal restrictions for MNOs and other non-banks to enter	Banks and Non banks are allowed to operate with a license from Central Bank.
Uganda	Minimal restrictions for MNOs and other non-banks to enter	Every provider of mobile money needs a license from Bank of Uganda and partner with a financial institution.. The partner financial institution shall manage the escrow account.
Zimbabwe	Minimal restrictions for MNOs and other non-banks to enter	No formal regulation of the sector, the Reserve Bank of Zimbabwe implemented a "test and learn" approach

Table 9. Main Mobile Money Schemes and Partnerships in Countries with Explosive Growth

Country	Number of Mobile Money Deployments	Main Mobile Money Schemes	Lead by:	In partnership with Bank
Bangladesh	9	bKash Dutch Bangla Bank	BRAC Bank Dutch Bangla Bank	
Cote D'Ivoire	6	Orange Money Moov MTN Mobile Money	Orange Etisalat MTN	BICICI BIAO Ecobank, Societe Generale
Kenya	7	M-Pesa Airtel Money Orange Money yucash	Safaricom Airtel Orange Essar Telecom	Bank of Africa, Equity Bank Citigroup, Standard Chartered Equity Bank -
Rwanda	5	MTN Mobile Money Tigo Cash Airtel Money	MTN Airtel Tigo	Commercial Bank of Rwanda, KCB KCB -
Somaliland		ZAAD	Telesom	-
Tanzania	5	M-Pesa Tigo Cash Airtel Money ezyPesa	Vodacom Tigo Airtel Etisalat	National Bank of Commerce - Citibank, Standard Chartered, Tanzania Postal Bank -
Uganda	6	MTN Mobile Money Airtel Money/Warid Orange Money M-Sente	MTN Airtel Orange UT Mobile	Stanbic Citibank, Standard Chartered Standard Chartered DFCU Bank and PostBank
Zimbabwe	4	EcoCash TeleCash	Econet Wireless Telecel	- -

2. Ignition with Slow Growth

The countries in which mobile money schemes have ignited but have not grown explosively are a mixed bag. Their common feature is that they appear to have viable mobile money schemes that are used by a small but significant portion of the population but they have not grown explosively; mobile money use is far from ubiquitous even though there would seem to be a need for it.

These countries are geographically dispersed with only one in Africa. The range of per capita GDP is quite large, from a low of US\$1,275 in Pakistan to a high of US\$2,791 in Philippines. Airtime

top up is an important use of mobile money in these countries. However, in several of them such as Pakistan and the Philippines, bill payment is a major use of mobile money. In Philippines, 41 percent of Gcash users and 29 percent of SMART money users paid bills in the last 12 months of 2010 using the service.⁵² In Pakistan, 34 percent of the total number of transactions are to pay bills and a large portion of the use of mobile money involves people going to agents who use their mobile money accounts to transfer funds. Only 3.7 percent of adults in Pakistan have a mobile money account and of those only 44 percent are active based on data from June 2014.⁵³

These countries have generally given MNOs, and other non-banks, latitude to lead mobile money efforts. However, the degree of regulation in these countries is somewhat higher than in the countries in the “ignition with explosive growth” category. Table 10 summarizes the key features of the regulatory regimes for these countries.

Table 10. Regulatory Model for Each Country that had Weak Ignition

Country	Assessment of Regulatory Framework		General Description
Ghana	Moderately heavy restrictions for MNOs to operate	heavy	Only Financial-Institution-led model of branchless banking is allowed. It can be implemented by agency arrangements or by creating a partnership between and FI and Agent Company. The Many-to-Many model is the only one permissible in Ghana, by which many banks can associate with many Telcos. Exclusive partnerships are not allowed. Customer account relationship must reside in some FI and each transaction must hit the actual customer account. Agents can open accounts Activities Agents can do: Open BB accounts, Cash/in Cash/out, Bills payments, loan disbursement, funds transfers.
Pakistan	Moderately heavy restrictions for MNOs to operate	heavy	The deployments can be implemented using a one-to-one, one-to-many and many-to-many model, but always with a bank involved Consumer accounts must reside with some FI and each transaction must hit the actual customer account and no value is stored on the mobile-phone or technology service provider. The ultimate responsibility of branchless banking lies with the FI. The rest of the players act only as agents. Agents can perform all the activities, such as account opening.
Philippines	Minimal restrictions for MNOs and other non-banks to operate		According to regulation, electronic money issuers can be classified as banks, non-banks financial institution and non banks institutions, which have to registered with the BSP as a money transfer agent.

⁵² *Demand Study of Domestic Payments in the Philippines*, BANKABLE FRONTIER ASSOCIATES (2010). Available at: <http://bankablefrontier.com/wp-content/uploads//documents/BMGF.PDP-FinalReport-dec2010.pdf>

⁵³ *Quarterly Branchless Banking Newsletter Apr-Jun 2014*, STATE BANK OF PAKISTAN, July 2014. Available at: <http://www.sbp.org.pk/publications/acd/BranchlessBanking-Apr-Jun-2014.pdf>

Banks are more significant players in these countries than in the countries where there has been ignition with explosive growth. Table 11 shows the major players in each countries and how they are organized. In Pakistan, the mobile money scheme is led by a bank, although often in close partnership with an MNO.

Table 11. Main Mobile Money Schemes, Investors and Partnerships in Countries with Weak Ignition

Country	Number of Mobile Money Deployments	Main Mobile Money Schemes	Lead by:	In partnership with Bank:
Ghana	4	Airtel Money	Airtel	Standard Chartered, Ecobank, UBA
		MTN Mobile Money	MTN	CAL Bank, Ecobank, Fidelity Bank
		Tigo Cash	Tigo	-
Pakistan	7	Easypaisa	Telenor	Tameer Bank- Microfinance Bank-
		Omni	UBL Bank	-
		Mobicash	Mobilink (Orascom)	Waseela Bank
		U-Paisa	Ufone PTCL	-
		Mobile-Paisa	Warid Telecom	Bank Alfalah
		Timepey	Zong (China Mobile)	-
Philippines	2	GCash	Globe Telecom	GXI
		SMART Money	Smart Communications	Bank de Oro (BDO)

3. Ignition Failure

The mobile money schemes started in 8 countries we considered have not ignited and as a result mobile money use in these countries is very low. These countries are in several different parts of the world and are at different stages of economic development ranging from Madagascar, the poorest, to Mexico, the wealthiest. Nigeria, one of the most successful African economies, is on the list.

The most striking feature of these countries is that they have all adopted regulatory frameworks that require that banks have significant involvement in mobile money schemes. Table 12 list the major mobile money schemes in each of the countries and how they are organized. In some

cases, such as Nigeria, the MNOs are forbidden from taking a major role in mobile money schemes and one are playing a significant role. In other cases, such as Haiti, the dominant MNO has taken the lead in developing the mobile money scheme but has been required to work closely with a bank.

Table 12. Main Mobile Money Schemes, Investors and Partnerships in Countries that Failed to Ignite

Country	Number of Mobile Money Deployments	Main Players Mobile Money Schemes	Lead by:	In partnership with:
Burkina Faso	2	Airtel Money	Airtel	EcoBank
		Inovapay	Independent MMP	-
Haiti	3	TchoTcho	Digicel	ScotiaBank
		Lajancash	Banque Nationale de Credit	-
India	15	MobileOnMoney	Independent MMP	-
		Airtel Money	Airtel	J&K Bank
		Beam Money	Independent MMP	-
Indonesia	6	Dometku	Indosat	-
		eCash	Mandiri Bank	Mandiri Bank
		T-Cash	Telkomsel	-
		XL Tunai	XL Axiata	-
Madagascar	3	Airtel Money	Airtel	Bank of Africa
		MVola	Telma	BFV Societe Generale, Tiavo
		Orange Money	Orange	MICRORED
Mexico	4	MiFon	Banorte	Banorte
		Transfer	Telcel	-
Nigeria	19	Pagatech	Independent MMP	-
		MobileMoney	GTBank	GTBank
		Etranzact	Independent MMP	-
		EaZyMoney	Zenith	Zenith
South Africa	6	WIZZIT	The South African Bank of Athens	Standard Bank
		MTN Mobile Money	MTN	South African Bank of Athens
		M-Pesa	Vodacom	NedBank
		FNB eWallet	First National Bank	-

These countries generally have imposed a variety of regulatory requirements on the mobile money schemes. Table 13 describes the details of the regulatory requirements. By contrast the countries in which mobile money has ignited, and either grown explosively or more slowly, generally have very limited requirements, mainly focused on requiring a 100 percent bank reserve for the electronic money that has been issued.

Table 13. Regulatory Model for Each Country that Failed to Ignite

Country	Assessment of Regulatory Framework	General
Burkina Faso	Minimal restrictions for MNOs or non-banks to enter.	E-money issuers can be banks in partnership with MNOs, or a non-bank that has been granted with a specific license by Central Bank
Haiti	Moderately heavy restriction for MNOs to operate.	Besides, FI need approval from Central Bank to launch mobile money services. Agents can open accounts, but the FI should make sure agents comply with KYC requirements. There are several requirements for agent recruiting which makes it difficult for small shops to qualify
India	Heavy restrictions for MNOs to operate	Mobile Money Guidelines only permit banks to participate as mobile money service providers. MNOs in fact participate with a special authorization from Reserve Bank of India, and operate m-wallets outside the mobile banking world. Banks should offer the service only to their own customers. Deposit taking activities can only be done by banks. The system is restricted to bank account which are KYC compliant.
Indonesia	Heavy restrictions for MNOs to operate	It doesn't allow banks to provide financial services through agents They cannot outsource KYC rules either.
Madagascar	Moderately heavy restriction for MNOs to operate.	MNOs can brand their mobile money services, but they need to form a exclusive partnership with a commercial bank to operate.
Mexico	Heavy restrictions for MNOs to operate	Only registered banks or non-banks will be able to offer mobile financial services. Deposit taking activities shall be done by commercial banks only. Account opening can be done by agents.
Nigeria	Heavy restrictions for MNOs to operate	There are three possible models of mobile money services: (i) bank focused, (ii) bank-led model and (iii) non-bank led model. MNOs are allowed to participate only in the bank-led model (ii) as partners. There are three types of Mobile Payments Scenario (i) Card account based, (ii) Bank account based and (iii) Stored Value (e-Money) Account Based.
South Africa	Heavy restrictions for MNOs to operate	This is a change introduced from previous Position Papers. Only SouthAfrican registered banks will be able to issue electronic money. The only way for non-banks to enter the market is with a sponsorship agreement with a bank.

4. Evidence from Recent Entrants

Mobile money schemes started too recently in 3 countries for us to make a determination on whether they have ignited.

Sri Lanka has had mobile money schemes since 2007. However, it initially started with a bank-centric model that did not ignite. More recently, in 2011, the Central Bank of Sri Lanka issued two guidelines by which it has allow non-banks, subject to some capital requirements, to operate mobile money schemes. The largest Sri Lankan MNO, Dialog Axiata, entered in June 2012 and got 1 million mobile money subscribers (about a third of its total subscribers), of whom 20 percent were active, in its first year. The development of the agent network has gone well. Sri Lanka has 11.4 agents per 10,000 adults in the country after only one year compared with Kenya where there were just 2.7 agents per 10,000 adults after a year.

The Democratic Republic of the Congo has 3 mobile money schemes operated by MNOs. In December 2013, 22 months after its start, 9.5 percent of mobile subscribers have mobile money accounts and 1.3 percent have active accounts. The agent network is also similar to what explosive ignition countries had in the first two years. It reached 2.19 agents per 10000 adults after the first 22 months of operations, compared to 2.74 in Kenya in a similar time frame, but lower than the 8.05 Zimbabwe had.

VI. Market Structure, Regulation, and Success

The 11 countries in which mobile money schemes have ignited—either with explosive or slower growth—provide a laboratory for examining a variety of issues concerning the market structure of mobile money schemes and possible regulatory problems.

1. Natural Monopoly Tendencies

These countries enable us to determine whether mobile money schemes naturally tend to monopolies as a result of scale economies and positive feedback effects. The answer is that they do not. Table 14 reports the available information on the share of the mobile money schemes in each of the countries together with information on the organization of the mobile phone industry. The evolution of mobile money schemes tends to track the evolution of the mobile operator business. When there is a dominant MNO, as there was in Kenya with Safaricom, that MNO establishes a dominant MMP. When there are several competing MNOs, each of them is able to establish a MMP, although of course some are more or less successful as doing this. It appears that an MNO can operate viable mobile money schemes that are limited to their base of mobile subscribers.

Table 14. Mobile Money Market Shares

Country	MNOs with Mobile Money Deployments	Market Share	Mobile Money Operators	Market Share
Bangladesh				
Burkina Faso	Airtel	37% ⁵⁴	Airtel Money	-
Cote D' Ivoire	MTN	34%	MTN Mobile Money	33%
	Orange	36% ⁵⁵	Orange Money	66%
			Celpaid	1%
			E-Tranzact	.56
Democratic Republic of Congo	Airtel	28%	Airtel Money	35%
	Vodacom	31%	M-Pesa	33%
	Tigo	14% ⁵⁷	Tigo Cash	32% ⁵⁸
Ghana	Tigo	13%	Tigo Cash	49%
	MTN	45%	MTN Mobile Money	39%
	Airtel	13% ⁵⁹	Airtel Money ⁶⁰	12%
Haiti	Digicel	66%	TchoTcho	57%
	Voila ⁶¹	34%	T-Cash ⁶²	43% ⁶³
India				
Indonesia	Telkomsel	49%	T-Cash (Telkomsel)	43%
	Indosat	23%	Indosat	0%
	PT XL	20% ⁶⁴	PT XL	0%
			Mandiri Bank	57% ⁶⁵
Kenya	Safaricom	68%	M-Pesa	71%
	Airtel	16%	Airtel Money	20%
	Orange	7%	Orange Money	1%
	Essar	8% ⁶⁶	yucash	8% ⁶⁷

⁵⁴ *Burkina Faso: Q4 2014 Connections, including cellular M2M*, GSMA Intelligence (accessed 01/08/2015 at 11:00 AM EST)

⁵⁵ *2010 Rapport D'Activités*, AGENCE DES TELECOMMUNICATIONS DE COTE D'IVOIRE (2010). Available at: http://www.atci.ci/images/stories/pdf/rapport_activite/Rapport_ATCI_2010.pdf

⁵⁶ *IFC Mobile Money Scoping Country Report: Cote D'Ivoire*, IFC (2012). Available at: http://www.ifc.org/wps/wcm/connect/2dc255804ef863c8ac1bef3eac88a2f8/MobileMoneyScoping_CI_ENG.pdf?MOD=AJPERES

⁵⁷ Simone Di Castri, *Enabling Mobile Money Policies in the Democratic Republic of Congo*, GSMA 5 (2014). Available at: <http://www.gsma.com/mobilefordevelopment/wp-content/uploads/2014/04/Enabling-Mobile-Money-Policies-in-the-Democratic-Republic-Of-Congo.pdf>

⁵⁸ Simone Di Castri, *Enabling Mobile Money Policies in the Democratic Republic of Congo*, GSMA 8 (2014). Available at: <http://www.gsma.com/mobilefordevelopment/wp-content/uploads/2014/04/Enabling-Mobile-Money-Policies-in-the-Democratic-Republic-Of-Congo.pdf>

⁵⁹ *Telecom Voice Subscription Trends 2014*, National Communications Authority of Ghana (2014). Available at: http://www.nca.org.gh/downloads/VOICE_Subscriber_Sept_2014.pdf

⁶⁰ Adisa King, *Tigo Ghana has the highest volume of Mobile Money Users*, TECHNOLOGYBANKER, November 8, 2012. Available at: <http://www.technologybanker.com/mobile/tigo-ghana-has-highest-volume-of-mobile-money-users#.VK6oTiuUfE1>

⁶¹ Pascal Simon, *IFC Mobile Money Scoping, Country Report: Haiti*, IFC 16 (2012). Available at: <http://www.ifc.org/wps/wcm/connect/2fce6c8043efb66095c7bd869243d457/Haiti+Public.pdf?MOD=AJPERES>

⁶² T-Cash does not longer operates in the mobile money market

⁶³ Pascal Simon, *IFC Mobile Money Scoping, Country Report: Haiti*, IFC 24 (2012). Available at: <http://www.ifc.org/wps/wcm/connect/2fce6c8043efb66095c7bd869243d457/Haiti+Public.pdf?MOD=AJPERES>

⁶⁴ *Accelerating Mobile Money in Indonesia: Opportunity Assessment*. USAID 8 (2011). Available at: http://pdf.usaid.gov/pdf_docs/pnadz190.pdf

⁶⁵ *Accelerating Mobile Money in Indonesia: Opportunity Assessment*. USAID 8 (2011). Available at: http://pdf.usaid.gov/pdf_docs/pnadz190.pdf

⁶⁶ *Quarterly Sector Statistics Report*, COMMUNICATIONS COMMISSION OF KENYA 9 (2013). Available at: <http://ca.go.ke/images/downloads/STATISTICS/Sector%20Statistics%20Report%20Q2%202013-14.pdf>

Country	MNOs with Mobile Money Deployments	Market Share	Mobile Money Operators	Market Share
Madagascar	Airtel	40%	Airtel Money	-
	Telma	31%	MVola	
	Orange	29% ⁶⁸	Orange Money	
Mexico	Telcel	71% ⁶⁹	Telcel Mifon Boom Financial eZuga	-
Nigeria			Pagatech	56%
			GTBank	20%
			Etranzact	13%
			Zenith	6%
Pakistan	Telenor	27%	Easypaisa	53%
	Warid	9%	Mobile Paisa (Warid)	4%
	Mobilink	28%	MobiCash	-
	Ufone	16% ⁷⁰	UPaisa	5%
			UBL Omni Waseela	23% 9% ⁷¹
Paraguay	Tigo	55%	Tigo	-
	Personal	33% ⁷²	Personal	
Philippines	SMART	68%	Smart Money	77%
	Globe	32%	GCash	23% ⁷³
Rwanda	MTN	50%	MTN Mobile Money	-
	Tigo	36%	Tigo Cash	
	Airtel	14%	Airtel Money	
Somaliland	Telesom	-	ZAAD	-
South Africa	MTN	33%	MTN Mobil Money	-
	Vodacom	42% ⁷⁴	M-Pesa WIZZIT	
			FNB eWallet Solutions	
Sri Lanka	Dialog	35%	eZCash	100% ⁷⁶

⁶⁷ *Better than Cash: Kenya Mobile Money Market Assessment*, USAID (2011). Available at: <http://nethope.org/assets/uploads/Kenya-Mobile-Money-Assessment.pdf>

⁶⁸ *GPM Case Study: Airtel, Madagascar*. GSMA 2 (2013). Available at: http://www.gsma.com/mobilefordevelopment/wp-content/uploads/2013/04/GPM_AirtelCaseStudy190413.pdf

⁶⁹ *IFC Mobile Money Scoping, Country Report: Mexico*. INTERNATIONAL FINANCE CORPORATION 18 (2011). Available at: <http://www.ifc.org/wps/wcm/connect/37512b004a052b268adefdd29332b51/Mexico+Public.pdf?MOD=AJPERES>

⁷⁰ *Telecom Indicators*, PTA (accessed on January 2, 2015 at 5:00 PM EST). Available at: http://www.pta.gov.pk/index.php?option=com_content&view=article&id=269&Itemid=599

⁷¹ *Quarterly Branchless Banking Newsletter Apr-Jun 2014*, STATE BANK OF PAKISTAN, July 2014. Available at: <http://www.sbp.org.pk/publications/acd/BranchlessBanking-Apr-Jun-2014.pdf>

⁷² *Informe Paraguay*, ASOCIACIÓN IBEROAMERICANA DE CENTROS DE INVESTIGACIÓN Y EMPRESAS DE TELECOMUNICACIONES 2 (2013). Available at: http://ahciet.net/index.php/estudios/doc_download/87-informe-paraguay

⁷³ These calculations were made with number of subscribers from different sources and dates. Data for GCash is for October 2014 of 3 million subscribers and data for Smart Money is for December 2011 with 10 million subscribers. *Smart Money logs double-digit growth*, SUNOSTAR, March 2, 2012. Available at: <http://www.sunstar.com.ph/cebu/business/2012/03/05/smart-money-logs-double-digit-growth-209621>; *Globe GCash partners with global crowd funding Kiva*, MANILA BULLETIN, October 24, 2014. Available at: <https://ph.news.yahoo.com/globe-gcash-partners-global-crowd-funding-source-kiva-202113176.html> and *Notes on Regulation of Branchless Banking in the Philippines*, CGAP (2010). Available at: <https://www.cgap.org/sites/default/files/CGAP-Regulation-of-Branchless-Banking-in-Philippines-Jan-2010.pdf>

⁷⁴ *South Africa: Q4 2014 Mobile Connections, Including M2M*, GSMA INTELLIGENCE (2014)

Country	MNOs with Mobile Money Deployments	Market Share	Mobile Money Operators	Market Share
Tanzania	Mobitel ⁷⁵	23%	mCash	
	Vodacom	36%	M-Pesa	-
	Airtel	33%	Airtel Money	
	Tigo	23%	Tigo Cash	
	Zantel	7% ⁷⁷	ezyPesa	
Uganda	MNO #1	18%	MNO #1	21%
	MNO #2	49%	MNO #2	49%
	MNO #3	14%	MNO #3	6%
	MNO #4	15% ⁷⁸	MNO #4	25% ⁷⁹
Zimbabwe	Econet Wireless	63%	EcoCash	100% ⁸¹
	Telecel	19%	TeleCash	
	NetOne	18% ⁸⁰	OneWallet	

2. Role of the CICO Networks

Successful mobile money schemes in lesser-developed countries require as we discussed earlier the simultaneous development of a CICO network. Agents are critical for senders to put money into mobile accounts and for receivers to take money out of the mobile accounts. The development of the mobile money schemes and the CICO agent networks go hand in hand because agents require enough volume to serve and senders and receivers need enough agents to participate. The evidence shows, however, that mobile money schemes are able to ignite and grow (explosively or more slowly) with a wide range of agent density. Table 15 lists active agents per 10,000 adults and active mobile subscribers per capita for the countries under analysis where both pieces of information are available. The density of the active agent networks ranges from a low of 1.05 agents per 10,000 adults in South Africa to a high of 48.46 in Kenya. Figure 2 plots the data. It suggests that

⁷⁶ The last data available was before Mobitel started its own Mobile Money Operator. Simone Di Castri, *Enabling Mobile Money Policies in Sri Lanka: the Rise of eZ Cash*, GSMA (2013). Available at: <http://www.gsma.com/mobilefordevelopment/wp-content/uploads/2013/09/Enabling-Mobile-Money-Policies-in-Sri-Lanka-GSMA-MMU-Case-Study-July2013.pdf>

⁷⁵ *Country Overview: Sri Lanka*, GSMA 4 (2013). Available at: <https://gsmaintelligence.com/files/analysis/?file=131003-sri-lanka.pdf>

⁷⁷ *Quarterly Telecom Statistics: Quarter 2 (December 2013) Report*, Tanzania Communications and Regulatory Authority, 2 (2013). Available at: <http://www.tcra.go.tz/images/documents/telecommunication/telecomStatsDec13.pdf>

⁷⁸ The names of the operators were not disclosed in the report. *Uganda Mobile Money Assessment and Case Study*, USAID 10 (2012). Available at:

http://solutionscenter.nethope.org/assets/collaterals/Uganda_Market_Assessment_and_Case_Studies_Final.pdf and *Bharti Airtel to Buy Warid Telecom Uganda, Subscriber Base to Increase by 60%*, VENTURES, April 24, 2013. Available at:

<http://www.ventures-africa.com/2013/04/bharti-airtel-to-buy-warid-telecom-uganda-subscriber-base-to-increase-by-60/>

⁷⁹ The names of the operators were not disclosed in the report. *Uganda Mobile Money Assessment and Case Study*, USAID 10 (2012). Available at:

http://solutionscenter.nethope.org/assets/collaterals/Uganda_Market_Assessment_and_Case_Studies_Final.pdf and *Bharti Airtel to Buy Warid Telecom Uganda, Subscriber Base to Increase by 60%*, VENTURES, April 24, 2013. Available at:

<http://www.ventures-africa.com/2013/04/bharti-airtel-to-buy-warid-telecom-uganda-subscriber-base-to-increase-by-60/>

⁸⁰ *Zimbabwe's Telecom Stats (2013): 103.5% Mobile Penetration Rate*, TECHZIM. January 9, 2014. Available at:

<http://www.techzim.co.zw/2014/01/zimbabwes-telecoms-stats-2013-103-5-mobile-penetration-rate/>

⁸¹ The report data is for July 2013. By that time TeleCash and OneWallet had not entered the market yet. Phil Levin, *Big Ambition Meets Effective Execution: How EcoCash is altering Zimbabwe's financial landscape*. GSMA (2013). Available at:

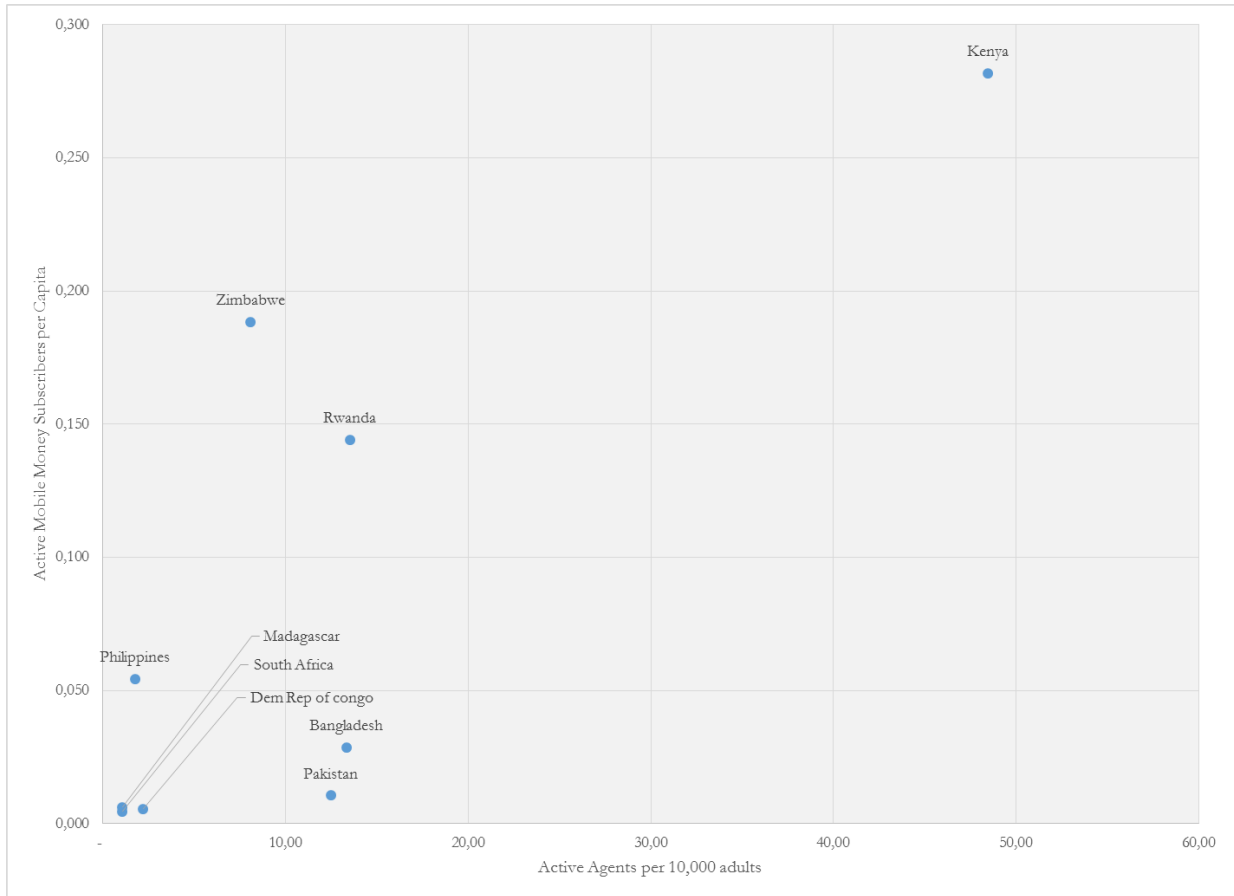
<http://www.gsma.com/mobilefordevelopment/wp-content/uploads/2013/07/EcoCash-Zimbabwe.pdf>

there is a positive correlation between the density of the CICO networks and mobile money use. The simple correlation between active mobile subscribers per capita and agents per 10,000 adults is 0.79.

Table 15. Agents and Active Subscribers

Country	Active Agents per 10000 adults	Active Mobile Subscribers per capita
Bangladesh	13.35	0.029
Dem Rep of Congo	2.19	0.006
Kenya	48.46	0.282
Madagascar	1.07	0.006
Pakistan	12.50	0.011
Philippines	1.74	0.054
Rwanda	13.55	0.144
South Africa	1.05	0.005
Zimbabwe	8.05	0.188

Figure 2. Relation Between Active Agents and Active Subscribers



VII. Conclusions

Seven years after Diners Club ignited the modern payments card industry in 1950 hardly anyone other than well-off travelers used payment cards, there was only one successful payment card network in the US and probably in the world, and hardly any country other than the US had significant domestic payment card business. Many entrepreneurs of course had tried their hands at payments cards in those seven years but virtually all of them failed. MasterCard and Visa didn't even start until 16 years after Diners Club started and it took them another decade to gain widespread use.⁸²

This pace seems slow in the Internet Age, when new startups like WhatsApp get hundreds of millions of users around the world in a few years. But it is largely the nature of payments. It is hard to get people and businesses to change how they pay. There's inertia. Few want to change unless they have a compelling reason to do to. There's also a coordination problem. Enough senders and receivers of money need to move to the new method to get it off the ground.

It is therefore not surprising, in light of the history of payment systems, and the economics of platforms, that we have so few success stories to point to seven years after the promising start of M-PESA in Kenya. What's remarkable, in fact, given the experience of other payment platforms over the last half century, is how rapidly M-PESA grew and that it has become essentially ubiquitous so quickly. Therefore, comparing the experience in other countries to Kenya is not sound way to evaluate mobile money schemes.

That said newborn mobile money systems face tough odds of growing much or even getting out of infancy. The challenges of simultaneously getting people to send and receive money over mobile phones and signing up agents to allow people to put cash in or take cash out of their mobile wallets are extreme. This study has revealed two key features behind success and failure.

The first is that the bigger the friction solved the greater the chance of success. This principle resolves the paradox the mobile money schemes have done the best in the poorest places in the world. The need for a safe, secure, and convenient method for moving money around the country dominates the practical difficulty of deploying a send-receive and CICO platform in countries that lack basic transportation systems.

The second is that it is hard enough to ignite a mobile money scheme to succeed given the difficulties of getting a critical mass of senders, receivers, and agents on board. The last thing mobile money schemes need is another set of burdens. Mobile money schemes have ignited in almost all cases in countries that have taken a light hand to regulation and have failed in almost every country that has taken a heavy hand and in particular has insisted that regulated banks take a leading role in operating the mobile money schemes. Such a stark difference is seldom found in empirical research. It strongly suggests that countries face a choice between igniting mobile money systems, with light regulation and with no requirement that banks play a central role, or having a mobile money system that sputters along at a low level of activity, if that.

⁸² DAVID S. EVANS, AND RICHARD SCHMALENSEE, *PAYING WITH PLASTIC: THE DIGITAL REVOLUTION IN BUYING AND BORROWING* (MIT Press, 2nd Edition, 2005)

Appendix A

Determination of Success for the Countries in the Study

Bangladesh

After three years of operations, mobile money service providers saw a huge growth in the volume of transactions in 2013, almost tripling between January and December – in January almost US\$ 300 million and in December almost US\$ 900 million of value of transactions.⁸³ We conclude that the country has ignited and grown explosively.

Burkina Faso

There is very little amount of information regarding the developments in Burkina Faso. With the information available we know that Inovapay, which launched in October 2009, reached only 60,000 registered users after 2 years. Those numbers account only for a 0.8 percent of the total number of mobile phone users. Additionally, Airtel money launched its service in July 2012, but there is no information available to whether or not they gained traction. Since MMPs tend to report good news we take this as evidence that it has not done well either. We conclude that the mobile schemes have not ignited.

Cote D'Ivoire

Schemes in the country have also been successful reaching registered users of 54.7 percent of adult population and active users of 10.9 of total mobile phone users. The value of mobile money transaction account 7.9 percent of the GDP. We conclude that the country has ignited and grown explosively.

Democratic Republic of Congo

The developments of mobile financial services in the country are very recent. Only 20 months after launching the first service, they already reached 9.5 percent of registered users of the total mobile phone users and only 1.30 percent of active users of the total mobile phone users. They have a low rate of usage, but it is still too soon to make a determination of whether they are igniting or not.

Ghana

According to information publicly available, the country has very promising numbers for its mobile money services, 35.90 percent of the adult population are registered to the services, as well as 19.30 percent of mobile phone users. The main concern is that there is no public information about the active rate of total subscribers to the services. Additionally, there are articles that describe the services in Ghana as "... the country has been slow to take off..."⁸⁴. To make a final determination we considered two pieces of information by which MTN Mobile Money in Ghana, has over two

⁸⁴ Claudia McKay and Peter Zetterli, *Unintentional Consequences: Branchless Banking in Ghana*, CGAP, January 3, 2013. Available at: <http://www.cgap.org/blog/unintentional-consequences-branchless-banking-ghana>

million registered users in the platform⁸⁵ and of those, around 1 million were active by mid 2014⁸⁶ Considering only MTN's active users, the country would have reached a 6 percent of active users of the adult population. Therefore, we consider Ghana to be a country that has ignited with slow growth.

Haiti

The country had a promising beginning with the launch of two mobile money services TchoTcho and T-Cash in November and December 2010. After one year of services, both schemes had gained 840,000 subscribers, with no information about active accounts. The most recent information discloses a total number of active users of 60,000 for the current service providers TchoTcho and Lajan Cash, clearly showing failure to ignite.⁸⁷

India

The country has been very slow to take off. There is mainly information available about one of the deployments, Money-On-Mobile, which has reached by its own a total users base of active user base of 1.1 percent of adult population⁸⁸. This numbers correspond solely to one provider. There is no data available about the rest of the providers in the country. With the information available, the schemes failed to ignite.

Indonesia

After four years of launching the first mobile money services, the country got a total of 3,070,000 active users in 2011. Those numbers represent 1.9 percent of adult population that are active users. More recent information shows that the number of total registered users reached 23,867,535 in 2013, which is still only 7.9 percent of total mobile phone users. The schemes failed to ignite.⁸⁹

⁸⁵ Masahudu Ankiilu Kunatch, *Ghana: Over Five Million Subscribers Patronise MTN Mobile Money Per Month*, ALLAFRICA, June 18, 2014. Available at: <http://allafrica.com/stories/201406181625.html>

⁸⁶ MTN Ghana to Expand Mobile Money Service in the Country, AYEKOO! NEWS, August 6, 2014. Available at: <http://news.ayekoo.com/1.1801302>

⁸⁷ Ángel González, *Push to Make Haiti an e-cash Economy Fell Far Short*, THE SEATTLE TIMES, January 10, 2015. Available at: <http://seattletimes.com/flatpages/nationworld/haiti-shaky-recovery-part-2-earthquake-five-years-later-annivers.html>

⁸⁸ Matt Averitt, *Calpian's Money-on-Mobile Drives Continued Growth in India, Exceeds 116 Million Cumulative Unique Users, Expands Distribution Network to 230,000 Retailers*, BUSINESS WIRE, December 23, 2014. Available at: <http://www.businesswire.com/news/home/20141223005285/en/Calpian%E2%80%99s-Money-On-Mobile-Drives-Continued-Growth-India-Exceeds#.VLHy6CuUfE0>

⁸⁹ *Accelerating Mobile Money in Indonesia, Opportunity Assessment*, USAID (2011). Available at: http://egateg.usaid.gov/sites/default/files/D1.%20FS%20Share_Opportunity_Assessment_Final.pdf, *Generation Next: Five Pathways to TMT growth in emerging markets*, LINKLATERS (2013). Available at: http://www.linklaters.com/pdfs/mkt/london/Linklaters-TMTGenerationNext-Mobile_money.pdf and *Financial Access Survey*, INTERNATIONAL MONETARY FUND. Available at: <http://fas.imf.org/Default.aspx>

Kenya

The country hosted one of the most successful mobile money schemes in the world, reaching more than 26 million of registered users and more than 12 million of active users in early 2014, which is more than 102 percent of adult population is registered and more than 48 of adult population are active users. It is one of the cases of clear explosive ignition.

Madagascar

Information from IMF Financial Access Survey shows that the total number of registered users was 1,706,406, and the number of active users 141,925 in 2013. Those numbers represent 12.9 and 1.1 percent of adult population respectively. We conclude that schemes fail to ignite.⁹⁰

Mexico

Information available on subscribers only from IMF Financial Access Survey. Total registered mobile money subscribers for 2013 was 2,699,378, which represents 3.4 percent of adult population. The schemes failed to ignite⁹¹

Nigeria

For October 2013, considering the 19 mobile money deployments altogether, they had 430,000 active mobile money subscribers, which was 0.3% of mobile phone users. Total number of registered users reached 6,918,329 for the same year and represented 7.5 percent of adult population. The schemes in Nigeria failed to ignite.⁹²

Pakistan

The number of subscribers of mobile money services in Pakistan is not very promising; it reached 3.3 percent of registered users in total population and 1.5 percent of active users in total population in 2014. Nevertheless, the main activity of mobile money in Pakistan comes from OTC transactions, which are users that do not have a branchless banking account. 80 percent of the activity comes from OTC transactions, 14 percent from M-wallets and 6 percent from agent transactions for liquidity purposes.⁹³ With that evidence we consider the schemes in the country as a weak ignition. Therefore, if the percent of mobile money is about 7 times (1/.14) more than the percent of active users (1.15) which suggests that the country has ignite but mobile money use has not grown explosively.

Paraguay

First mobile money services in Paraguay started in July 2010. After almost two years the service only reached 60,000 active users, which is 0.9 percent of mobile phone users. There is no

⁹⁰ Corinne Riquet, *Small Farmers, Mobile Banking, Financial Inclusion in Madagascar*, CGAP, October 28, 2013. Available at: <http://www.cgap.org/blog/small-farmers-mobile-banking-financial-inclusion-madagascar> and *Financial Access Survey*, INTERNATIONAL MONETARY FUND. Available at: <http://fas.imf.org/Default.aspx>

⁹¹ *Financial Access Survey*, INTERNATIONAL MONETARY FUND. Available at: <http://fas.imf.org/Default.aspx>

⁹² *Financial Access Survey*, INTERNATIONAL MONETARY FUND. Available at: <http://fas.imf.org/Default.aspx>

⁹³ *Quarterly Branchless Banking Newsletter, Apr-Jun 2014*, STATE BANK OF PAKISTAN (2014). Available at: <http://www.sbp.org.pk/publications/acd/BranchlessBanking-Apr-Jun-2014.pdf>

information available on the evolution after March 2012.⁹⁴ Recently, in March 2014, there were changes in the regulation making easier for Telcos to operate.⁹⁵ Given the information available, there is no basis to determine failure or success of mobile money schemes in the country.

Philippines

There are two mobile network operators in Philippines, and both launched their mobile money services. Latest information available from IMF Financial Access Survey, shows that in 2013 registered and active users reached 13.2 and 8.8 percent of adult population respectively. This is considered weak ignition.⁹⁶

Rwanda

Mobile money developments in Rwanda are successful, since they reached 59.4 percent of adult population in 2014 after four years of service. The annual growth in the number of registered users from June 2013 – June 2014 was 87 percent. Information from IMF Financial Access Survey shows that active users were 26.4 percent of adult population in 2013. These numbers are considered explosive ignition.⁹⁷

Somaliland

It becomes difficult to access Somaliland since there are no official statistics regarding population or size of the country. Basing the analysis from a study from GSMA⁹⁸, the number of registered users as part of mobile phone users was 33.1 percent after four year of launching the services. Additionally there are several articles that sustained that the scheme is very successful.⁹⁹

South Africa

Latest information available shows that in 2013 registered users reached 3.5 of total mobile phone users, and active users reached 0.3 percent of mobile phone users for the same period.. With the information available the schemes in the country failed to ignited.¹⁰⁰

⁹⁴ Camilo Tellez and M.Yasmina McCarty, *Mobile Money in Latin America: A Case Study of Tigo Paraguay*, GSMA (2012). Available at: <http://www.gsma.com/mobilefordevelopment/wp-content/uploads/2012/03/tigopyenfinal.pdf>

⁹⁵ Mireya Almazan, *Financial Inclusion in Paraguay: New Mobile Money Regulation*, GSMA, July 21, 2014. Available at: <http://www.gsma.com/mobilefordevelopment/financial-inclusion-in-paraguay-new-mobile-money-regulation?>

⁹⁶ *Financial Access Survey*, INTERNATIONAL MONETARY FUND. Available at: <http://fas.imf.org/Default.aspx>

⁹⁷ *Annual Report 2013/2014*, NATIONAL BANK OF RWANDA (2014). Available at: http://www.bnr.rw/index.php?id=231&eID=dam_frontend_push&docID=1216 and *Financial Access Survey*, INTERNATIONAL MONETARY FUND. Available at: <http://fas.imf.org/Default.aspx>

⁹⁸ Claire Pénicaut and Fionan McGrath, *Innovative Inclusion: How Telesom ZAAD Brought Mobile Money to Somaliland*, GSMA (2013). Available at: <http://www.gsma.com/mobilefordevelopment/wp-content/uploads/2013/07/Telesom-Somaliland.pdf>

⁹⁹ Gianluca Iazzolino, *Somaliland has Embraced Mobile Money – but at what price?*, THEGUARDIAN, May 19, 2014. Available at: <http://www.theguardian.com/global-development/2014/may/19/somaliland-mobile-money-zaad-inflation-economy-banking-remittance>

¹⁰⁰ *Financial Access Survey*, INTERNATIONAL MONETARY FUND. Available at: <http://fas.imf.org/Default.aspx>

Sri Lanka

After one year of operations, eZ Cash, the only mobile money service when the information was published, had reached a registration of users of 4.9 percent of mobile phones and active users of 1 percent of mobile phones. It is still to soon to access whether the scheme ignited or not.¹⁰¹

Tanzania

The schemes are well known for its success. In 2013, service providers reached overall 115.9 percent of registered users as part of total mobile phone users (considering that each mobile user could have more than one mobile money account), 40.1 percent of active users of the service as part of total mobile phone users and the value of mobile money transaction represented 53.3 percent of the GDP at current price of Tanzania.¹⁰²

Uganda

The schemes, like the ones in Tanzania, are also very successful. Considering the information available, in 2014 registered users were 90.8 percent of adult population, but had a number quite lower for active users in 2012, reaching 9 percent of mobile phones subscribers. In any case, for 2014 the value of mobile money transactions reached 39.7 percent of the GDP of Uganda.¹⁰³

Zimbabwe

The level of acceptance of mobile money services in Zimbabwe was very high in a short period of time. After the first year of operations, the value of mobile money transactions represented 22 percent of Zimbabwe's GDP. After two years of operations, the number of active subscribers was 19.5 percent of total mobile phone subscribers.¹⁰⁴

¹⁰¹ Simone Di Castri, *Enabling Mobile Money Policies in Sri Lanka: The Rise of eZ Cash*, GSMA (2013). Available at: <http://www.gsma.com/mobilefordevelopment/wp-content/uploads/2013/09/Enabling-Mobile-Money-Policies-in-Sri-Lanka-GSMA-MMU-Case-Study-July2013.pdf>

¹⁰² Simone Di Castri and Lara Gidvani, *Enabling Mobile Money Policies in Tanzania: A test and learn approach to enabling market-led digital financial services*, GSMA (2014). Available at: <http://www.gsma.com/mobilefordevelopment/wp-content/uploads/2014/03/Tanzania-Enabling-Mobile-Money-Policies.pdf>

¹⁰³ Martin Luther Oketch, *Registered Mobile Money users Reach 17 Million Mark*, DAILY MONITOR, August 8, 2014. Available at: <http://www.monitor.co.ug/Business/Registered-mobile-money-users-reach-17-million-mark/-/688322/2411528/-/rjcg2z/-/index.html> and *Uganda Mobile Money Assessment and Case Study*, USAID (2012). Available at: http://solutionscenter.nethope.org/assets/collaterals/Uganda_Market_Assessment_and_Case_Studies_Final.pdf

¹⁰⁴ *4.2m use EcoCash*, WEEKENDPOST, June 27, 2014. Available at: <http://www.weekendpost.co.zw/articles/2014/06/27/4-2m-use-ecocash>, Phil Levin, *Big Ambition Meets Effective Execution: How EcoCash is Altering Zimbabwe's Financial Landscape*, GSMA (2013). Available at: <http://www.gsma.com/mobilefordevelopment/wp-content/uploads/2013/07/EcoCash-Zimbabwe.pdf> and *Financial Access Survey*, INTERNATIONAL MONETARY FUND. Available at: <http://fas.imf.org/Default.aspx>

Appendix B

Assessment of Length of Time that it Took Schemes to Reach Critical Mass

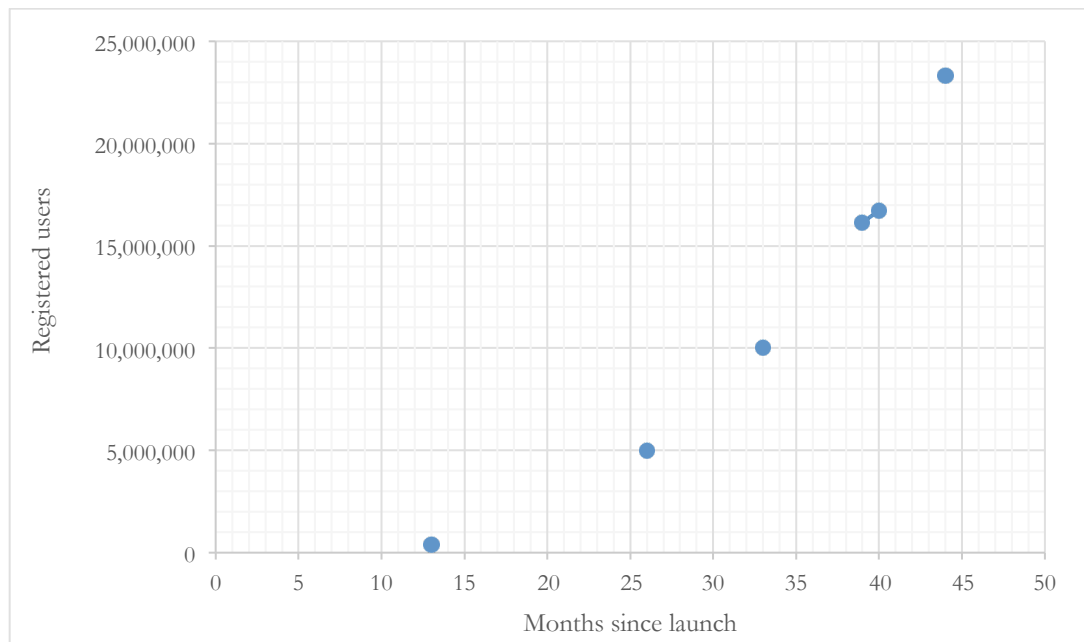
To estimate the length it took mobile money schemes in each of the countries to reach critical mass and ignite, we analyze the evolution, since the moment mobile money schemes start, of variables that indicate usage of these schemes. Such variables could be number of transactions, value of transactions or active users of mobile money schemes. These variables are not always available and when any was available we use total registered mobile money users. This variable is a poor substitute of the previously three mentioned variables, but it is the one we used in most cases since it's the more widely available of the four.

Observing the evolution in the usage of the schemes, ignition is determined the moment the growth path in the usage changes completely, showing an increase in the growth rate, a change in the tendency and an inflection point in the usage of the schemes. That is the moment we consider as the ignition point. The length is measured since the moment mobile money schemes start, until the ignition point. This is expressed in most cases in number of months, quarters or years it took to reach that point.

Below we make the determination of each of the countries in each of the four categories of determination of success. When there is enough data points for the country, a graph is presented.

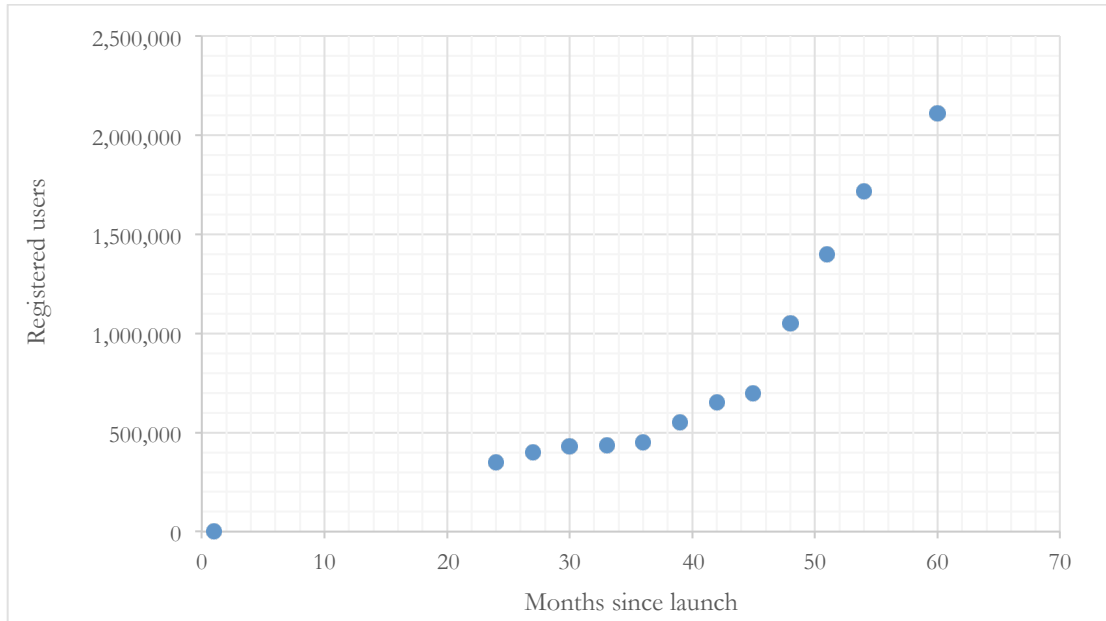
Countries that had ignited strongly

Bangladesh



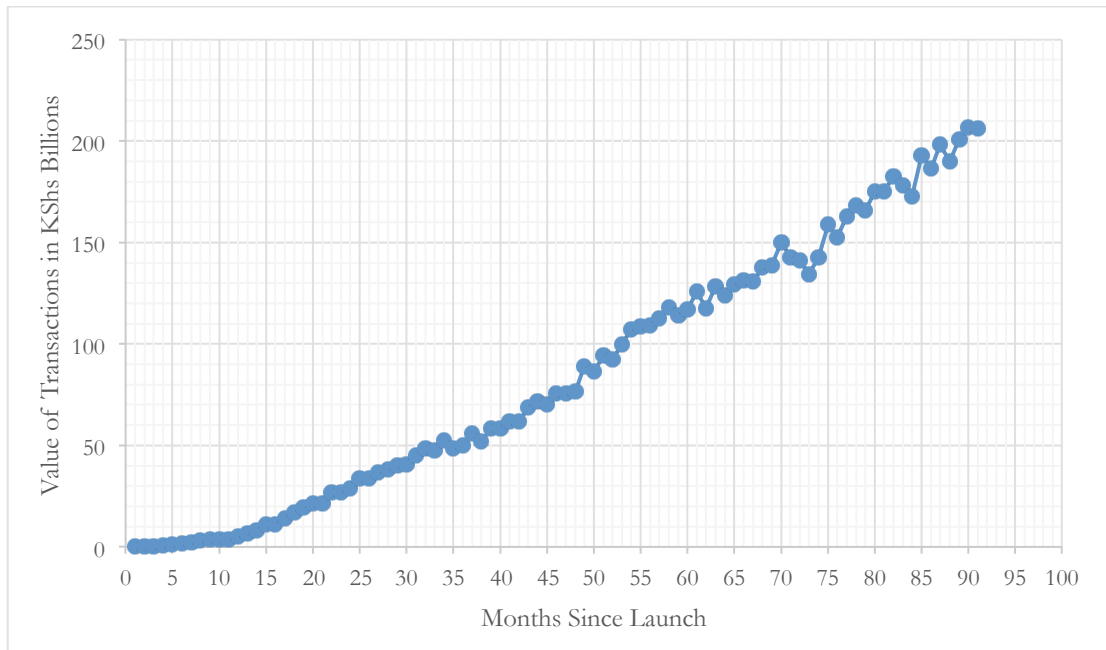
There is an inflection point an ignition between month 13 and month 26 after launch.

Cote D'Ivoire



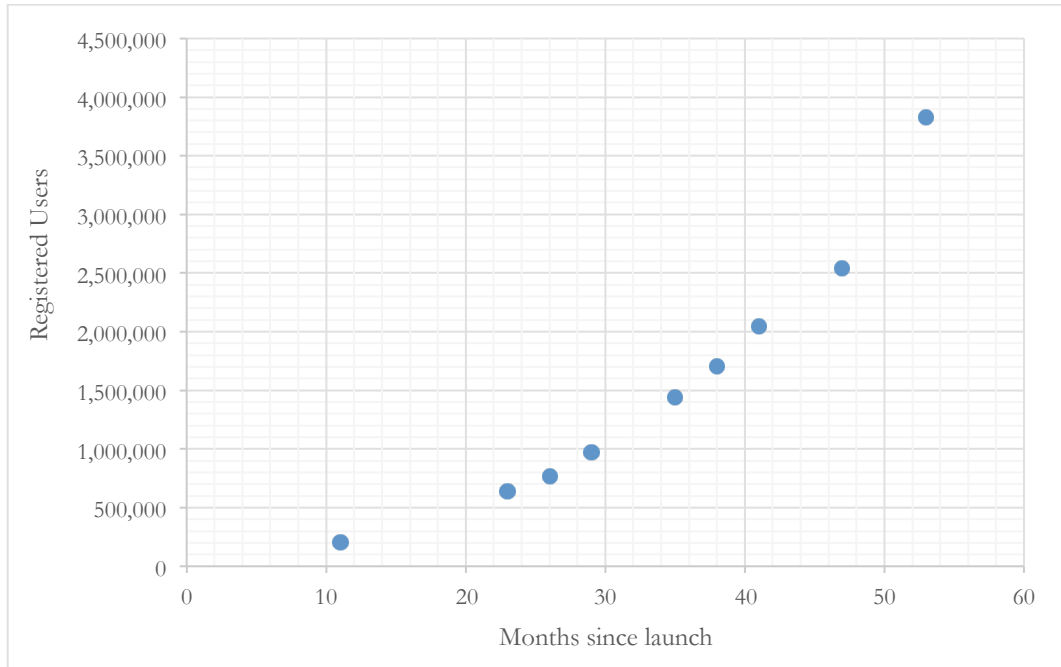
There is an inflection point in month 45 after launch.

Kenya



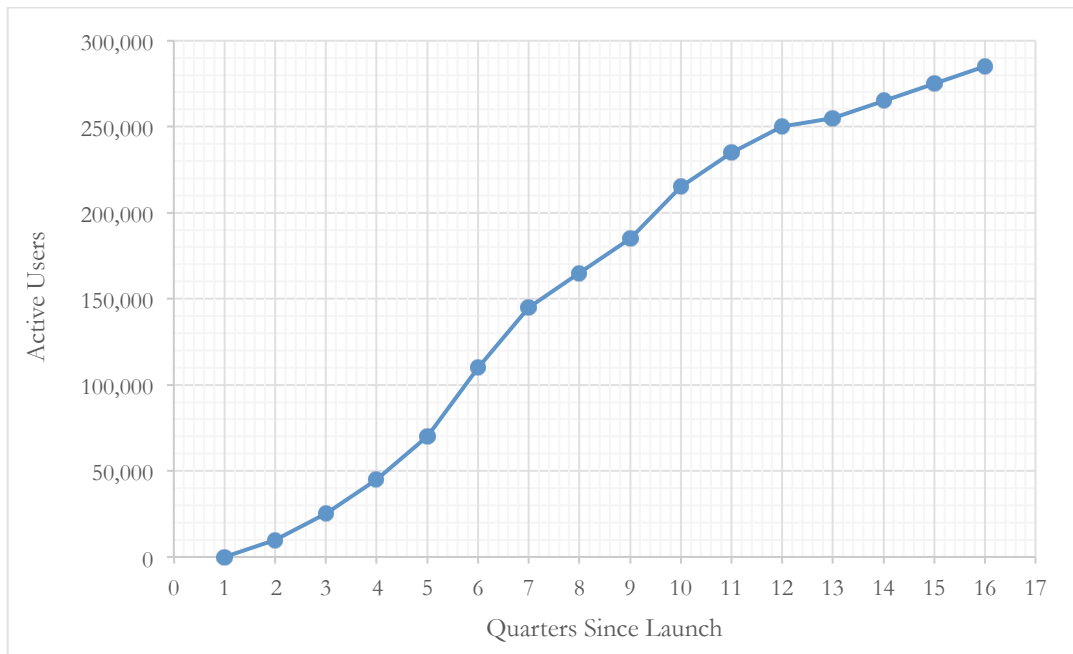
There is an inflection point in month 11 after launch.

Rwanda



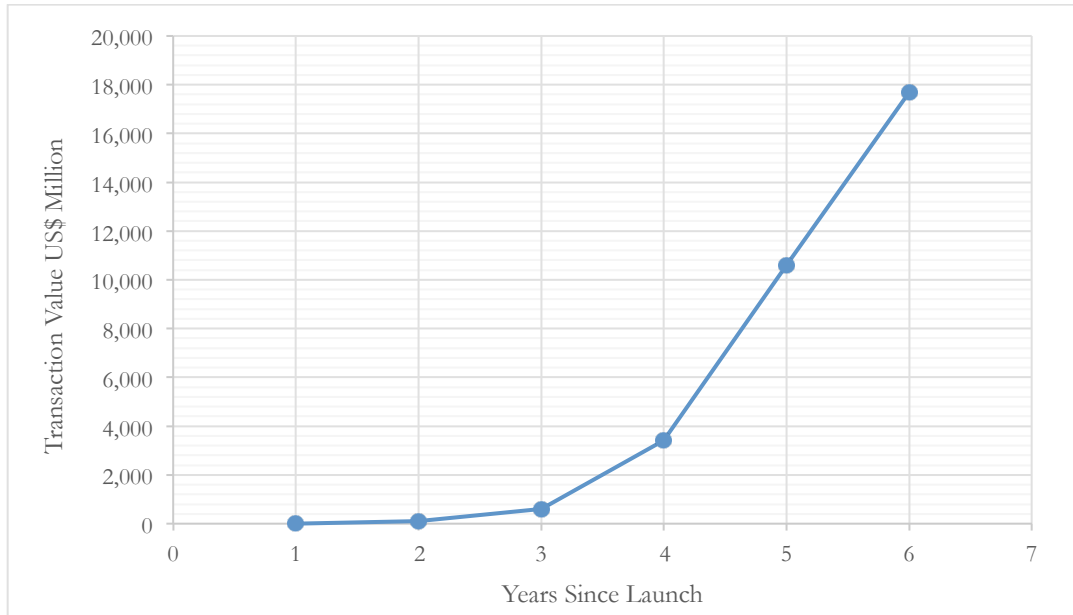
There is an inflection point between month 29 and month 35 after launch

Somaliland



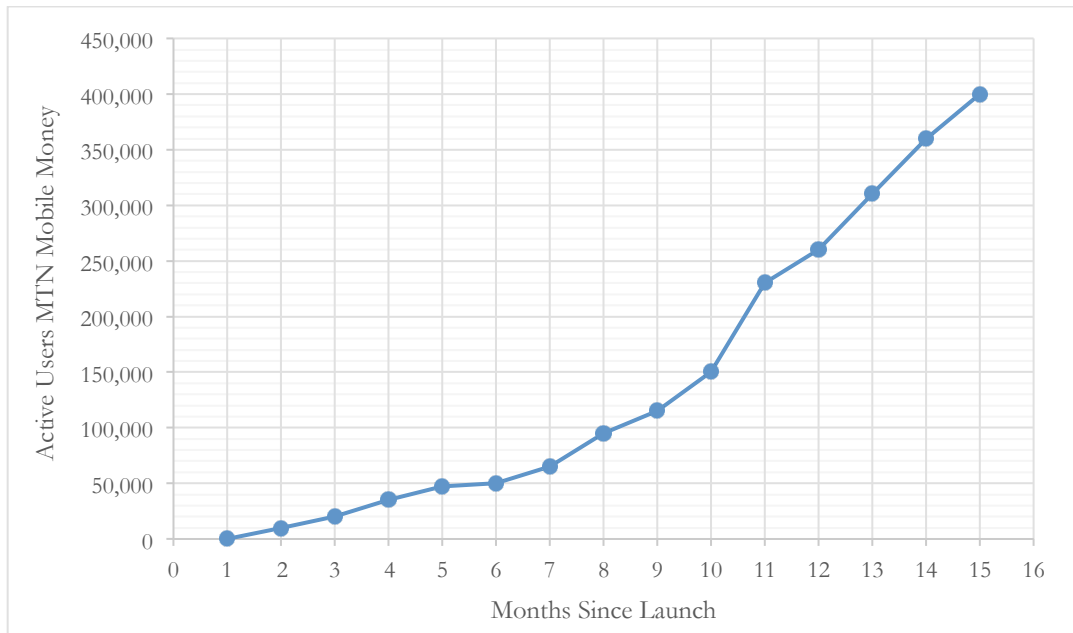
There is an inflection point in quarter 5, between.13 and 15 months after launch

Tanzania



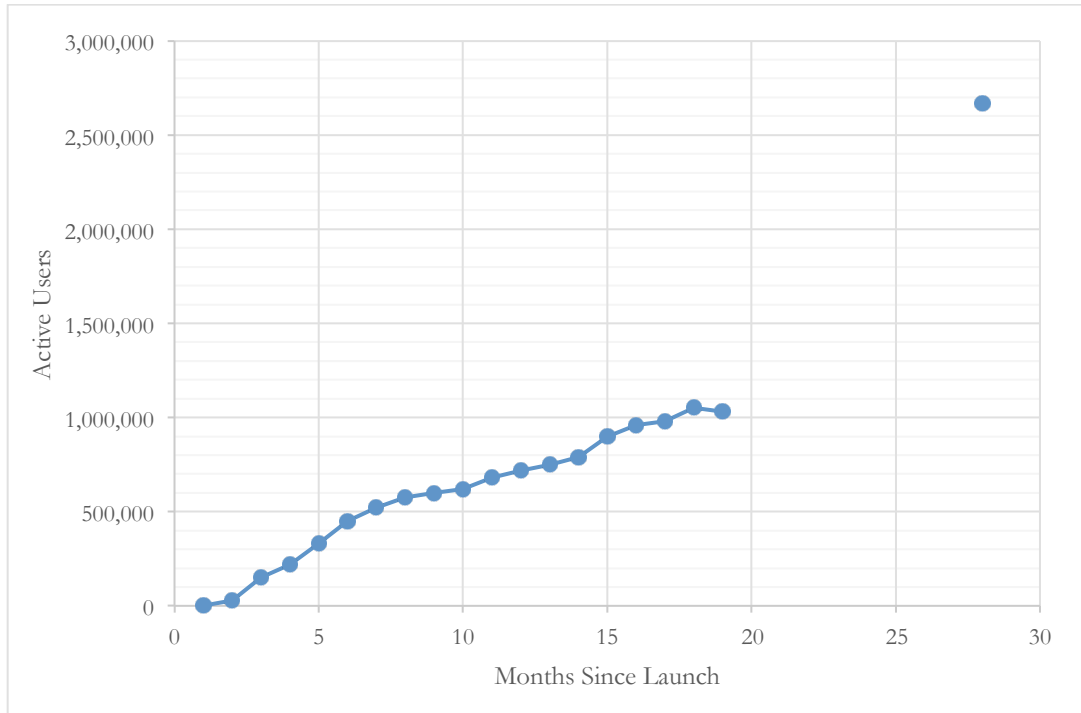
There is an inflection point during fourth year of operations, between month 36 and month 48 since launch.

Uganda



There is an inflection point in month 10 since launch.

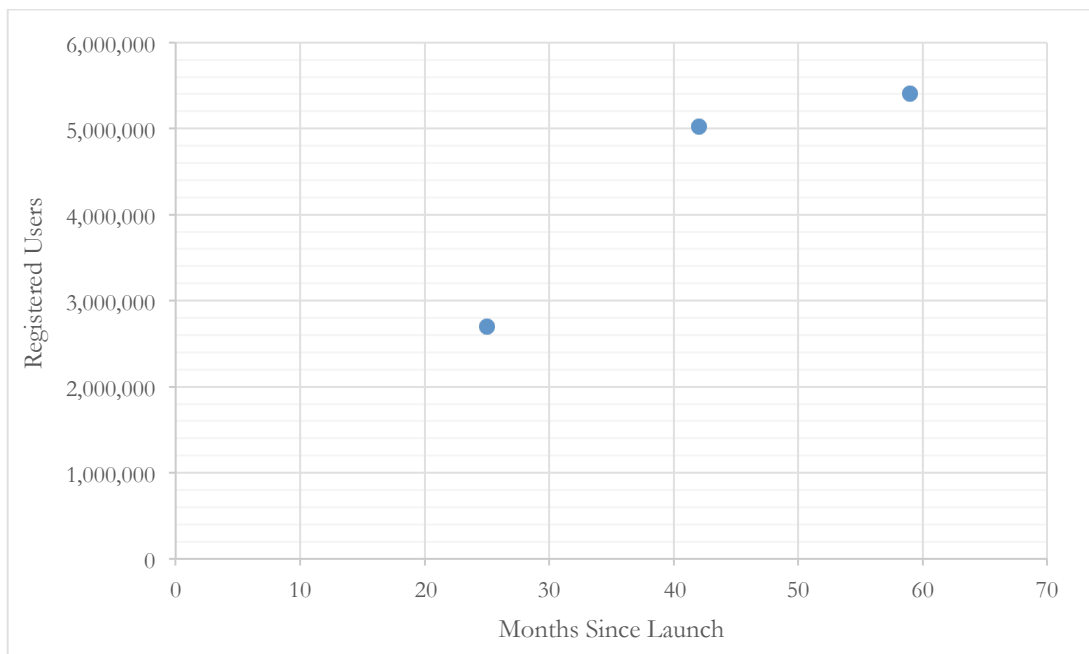
Zimbabwe



There is an inflection point 2 months after launch

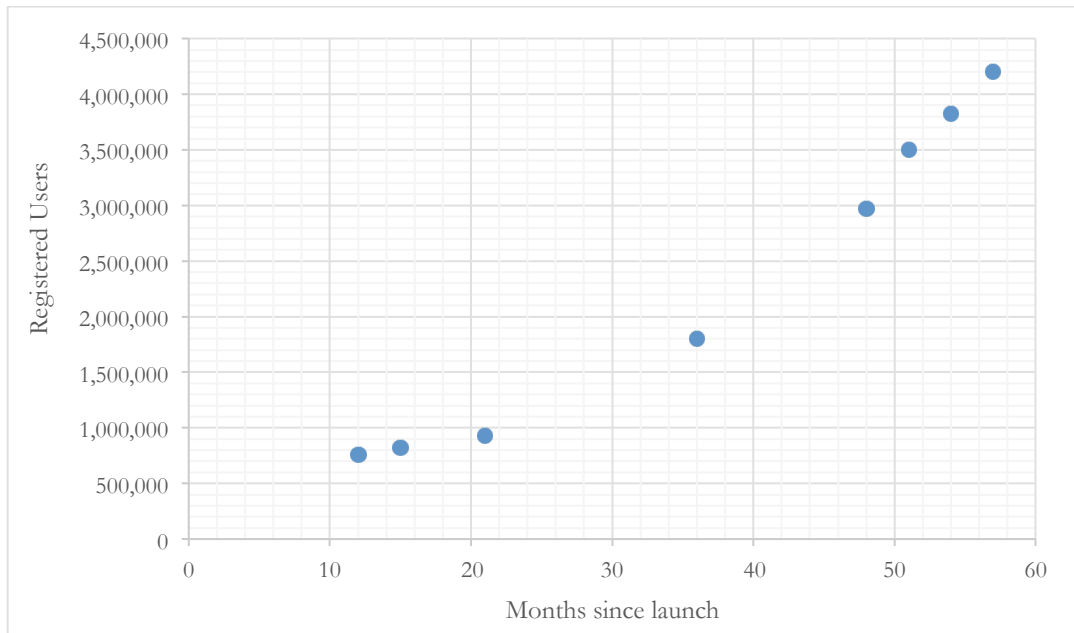
Countries that had ignited but weakly so

Ghana



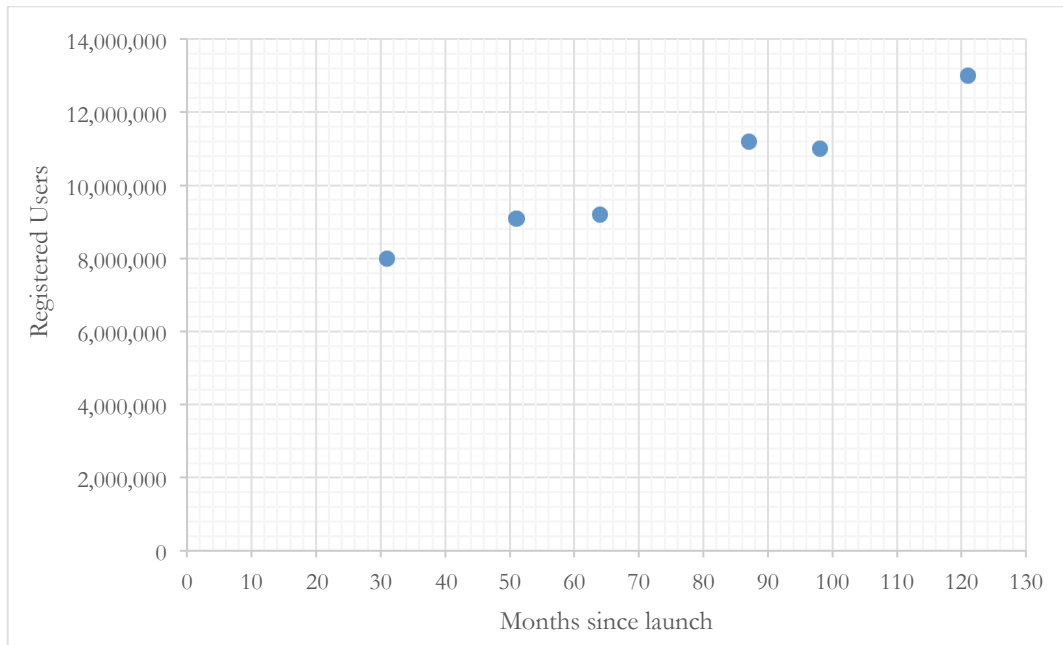
Is it difficult to assess an inflection point with the data available. It should have been between month 0 and month 25 after launch.

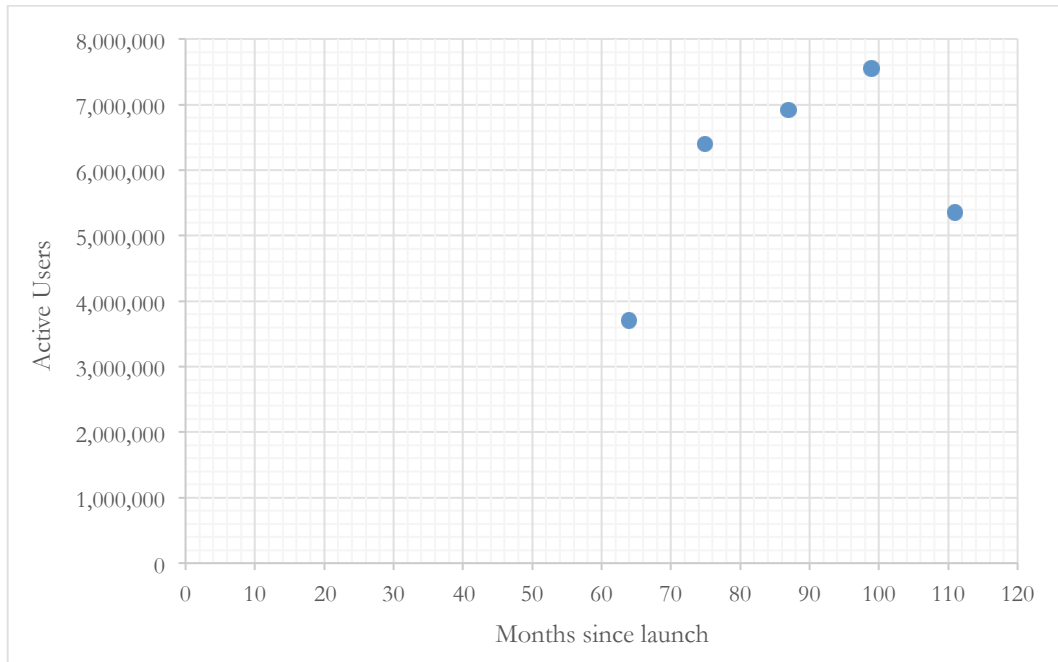
Pakistan



There is an inflection point between month 36 and month 48 after launch.

Philippines





It is difficult to access an inflection point with the data available. Using data of registered users, inflection point should had been between 0 months and 31 months after launch.

Readers with comments should address them to:

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