Success factors for mobile money services

A quantitative assessment of success factors

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Introduction

The last decade has seen an explosion in the use mobile phones. As of the end of 2015, there were 7.6 billion mobile connections, representing an estimated 4.6 billion mobile subscribers worldwide.[1] A rapidly increasing share of these mobile connections are smartphones, with 3.3 billion in 2015, growing to a projected 5.7 billion in 2020.[2]

This explosive growth in mobile phones stands in stark contrast to the slower diffusion of formal financial services, such as savings accounts, which have been around since at least the 14th century. Despite a more than 500-year head start, only 3.2 billion adults globally hold a savings account in 2014.[3] The rapid, early success of M-PESA in Kenya led some to predict that low-cost, digital financial services would quickly spread throughout the developed and developing world. M-PESA reached one million active mobile money accounts in 2008,[4] however it took a further three years for a second service to reach the one million active accounts mark. In recent years, this has changed. Since 2012, the growth of mobile money has increased substantially, and by the end of 2015, 17 services had surpassed one million active accounts on a 30-day basis. On a 90-day basis, 30 services had passed one million active accounts, and five services had more than five million active accounts.[5]

This industry growth, coupled with greater availability of mobile money data in recent years, has created an opportunity to explore some of the patterns in this success. Which factors are associated with the success of mobile money services in recent years? Are there country-level or provider-level characteristics that inhibit—or facilitate—the growth of mobile money services?

To better understand the success factors for mobile money, the GSMA partnered with Shawn Cole, a professor at Harvard Business School, and Jake Kendall, the Director of DFS Lab at Caribou Digital, to examine the relative importance of key business and market characteristics on the growth of active mobile money accounts, as well as on mobile money transaction volumes and values through multi-variable regression analyses. While previous research has also focused on quantitative factors for success of mobile money, only a selected number of countries were analysed and the sample size was small.[6] We believe this is the first-ever large-sample quantitative analysis of the expansion of digital financial services. This document describes some of the highlights of the analysis, which the authors have released separately, and will be submitted to a peer-reviewed journal for publication.

1. GSMA Intelligence. Available at: https://gsmaintelligence.com/

2. Ibid.

3. A. Demirguc-Kunt, L Klapper, D. Singer, and P. V. Oudheusden; "The Global Findex Database 2014: Measuring Financial Inclusion around the World", World Bank, WPS 7255, 2015. Available at: http://documents.worldbank.org/curated/en/187761468179367706/pdf/WPS7255.pdf#page=3

4. Throughout this publication, we define "active accounts" as those that have been used at least once in a 30-day period.

5. GSMA. (2016). 2015 State of the Industry Report on Mobile Money. Available at: http://www.gsma.com/mobilefordevelopment/wp-content/uploads/2016/04/SOTIR_2015.pdf

6. Evans, David S. and Pirchio, Alexis, An Empirical Examination of Why Mobile Money Schemes Ignite in Some Developing Countries but Flounder in Most (March 14, 2015). University of Chicago Coase-Sandor Institute for Law & Economics Research Paper No. 723. Available at: http://dx.doi.org/10.2139/ssrn.2578312

Approach: Defining factors for success

Launching a successful digital financial service can be challenging for a number of reasons. The regulatory environment may prohibit certain providers, such as mobile network operators (MNOs), from issuing e-money or offering other bank-like services. Further, providers need significant time and resources to deploy a robust agent network and to acquire and educate customers—often investing six to eight times the revenue units generated by mobile money during this start-up phase.[7] In some markets, the customer value proposition may be low, meaning there is significantly less profit to be made. Further, even when no regulatory barriers exist, smaller MNOs may (rightly or wrongly) believe they are in a poor position to compete against a larger market leader.

While a number of detailed case studies and discussions papers have examined these (and other)

determinants of DFS success,[8] their relatively small samples, and perhaps a temptation to focus on either spectacular successes or conspicuous failure, risk missing the big picture. To address this gap, this paper uses a proprietary dataset, collected by the GSMA, to examine all attempted launches of mobile money services for the unbanked, in nearly every middle- and low-income in the world.

Throughout this publication, we refer to two metrics to measure success in mobile money: the first is the number of active mobile money accounts on a 30-day basis; and the second is the percentage of active mobile money accounts as a proportion of unique mobile subscribers—the 'addressable market' for mobile money providers.[9] Further, Appendix A provides information about data limitations in this research.

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7. Almazán, M. and Vonthron, N. (2014). *Mobile money profitability: A digital ecosystem to drive healthy margins*. GSMA Mobile Money for the Unbanked.
    Available at: http://www.gsma.com/mobilefordevelopment/wp-content/uploads/2015/11/2014_Mobile-money-profitability-A-digital-ecosystem-to-drive-healthy-margins.pdf

8. For more information, see:
    Almazán, M. and Vonthron, N. (2014). *Mobile money profitability: A digital ecosystem to drive healthy margins*. GSMA Mobile Money for the Unbanked.
    Available at: http://www.gsma.com/mobilefordevelopment/wp-content/uploads/2015/11/2014_Mobile-money-profitability-A-digital-ecosystem-to-drive-healthy-margins.pdf

    di Castri, S. (2013). *Mobile Money: Enabling regulatory solutions*. GSMA Mobile Money for the Unbanked.
    Available at: http://www.gsma.com/mobilefordevelopment/wp-content/uploads/2013/02/MMU-Enabling-Regulatory-Solutions-di-Castri-2013.pdf

    Dittus, P. and Klein, M. U. (2011). *On Harnessing the Potential of Financial Inclusion*. BIS Working Paper No. 347. Available at: http://ssrn.com/abstract=1859412

    Eijkman, F., Kendall, J. and Mas, I. (2009). Bridges to Cash: *The Retail End of M-PESA*. Savings & Development, Vol. 34, No. 2, 2010.
    Available at: http://ssrn.com/abstract=1655248

    Faz, X. and Arabéhéty, P. (2015). *Driving Scale and Density of Agent Networks in Perú*. CGAP.
    Available at: http://www.cgap.org/publications/driving-scale-and-density-agent-networks-per%C3%BA

    Katakam, A. (2014). *Setting up shop: Strategies for building effective merchant payment networks*. GSMA Mobile Money for the Unbanked. Available at:
    http://www.gsma.com/mobilefordevelopment/wp-content/uploads/2014/10/2014_DI_Setting-up-shop_Strategies-for-building-effective-merchant-payment-networks.pdf

    Mas, I. (2009). *The Economics of Branchless Banking*. Innovations, Vol. 4, No. 2, 2009. Available at: http://ssrn.com/abstract=1552750

    Mas, I. and Ng'weno, A. (2010). *Three Keys to M-PESA's Success: Branding, Channel Management and Pricing*. Journal of Payments Strategy and Systems, Vol. 4, No. 4,
    December 2010. Available at: http://ssrn.com/abstract=1593387

    Mas, I. and Radcliffe, D. (2010). *Mobile Payments Go Viral: M-PESA in Kenya*. Capco Institute's Journal of Financial Transformation, No. 32, p. 169, August 2011.
    Available at SSRN: http://ssrn.com/abstract=1593388

    Sitbon, E. (2015). *Addressing Competition Bottlenecks in Digital Financial Ecosystems*. Journal of Payments Strategy & Systems, Volume 9, Number 3, 2015.
    Available at: http://ssrn.com/abstract=2673637

9. We chose the addressable market to be the same for both MNO and non MNO-led services.

Datasets for analysis

This analysis uses a dataset comprised of six different data sources, which are outlined in Appendix B:

1. GSMA Intelligence

2. GSMA Mobile Money Deployment Tracker

3. GSMA Global Adoption Survey of Mobile Financial Services. Appendix C offers definitions for all metrics collected in this survey.

4. GSMA Mobile Money Estimates & Forecasts

5. GSMA Mobile Money Regulatory Tracker

6. World Bank Databases (Global Findex and World Development Indicators)

Factors for analysis

Hypotheses of factors which are associated with success of mobile money were considered from three different perspectives.

1. **Provider-level characteristics:** We assessed how important factors related to providers are in predicting the success of services. In particular, we looked at:

   • Provider type (MNO- vs. non MNO-led service[10]): Do services launched by mobile operators achieve greater scale or scope than those launched by other entities, such as financial institutions?[11]

   • First-mover advantage: To what extent do first movers in a market enjoy an advantage over subsequent services?

   • Multi-service advantage: Are providers whose operations span multiple countries more effective in developing mobile money services?

   • Existing market share of mobile network operators: Are MNOs with a larger market share of mobile connections more likely to succeed in the mobile money business?

2. **Regulatory considerations:** We analysed how important the role of regulation is on the success of services. Since 2013, the GSMA has classified countries as either 'enabling' or 'non-enabling' based on an assessment of the regulatory environment.

3. **Country-level factors:** We analysed how important specific country factors are in predicting the launch, and ultimate success, of mobile money services. Factors we analysed were:

   • Ease of Doing Business Rank: Is there a relationship between a country's rank on this index and success?

   • Formal financial account ownership: How are levels of formal bank account ownership associated with success?

   • Population density: Do higher or lower levels of population density play a role?

   • GDP per capita: Is mobile money more compelling for low-income populations?

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10. A mobile money service is operationally run by a mobile network operator (MNO) when the MNO is ultimately responsible for the design and implementation of the majority of the operational strategy, including distribution, marketing and customer care.

11. It is impossible for a mobile network operator to offer mobile money without a bank. Banks and MNOs always need to work together to offer mobile money services, and there are a wide variety of partnership opportunities. MNO vs. non MNO-led dichotomy is not entirely representative of the range of partnership models and is a practical construct for ease of analysis.

Key findings[12]

Provider-level factors associated with success of mobile money

We analysed mobile money services against four provider-level characteristics to assess whether these were associated with the success of services. To varying degrees, all four characteristics appear to be factors in the success of mobile money services.

Provider type: MNO- vs. non MNO-led services

Our analysis found that MNOs have been much more successful in developing and delivering digital financial services than other entities, such as banks or non-bank financial services providers. We compared the expansion of mobile money services led by MNOs against those led by other entities, and found dramatic differences in the immediate, and subsequent success in terms of active mobile money accounts across these two types of services (see Figure 1). Services launched by MNOs obtained an average of almost 45,000 active accounts within a year of launch (compared to almost 28,000 for non-MNOs)—a 60% difference. By the fifth year since launch, this difference had grown almost four-fold, with MNO-led services obtaining an average of almost 635,000 active mobile money accounts against 165,000 for non MNO-led services.

FIGURE 1

Active mobile money account growth for MNO- and non MNO-led services

MNO-LED SERVICE   NON MNO-LED SERVICE

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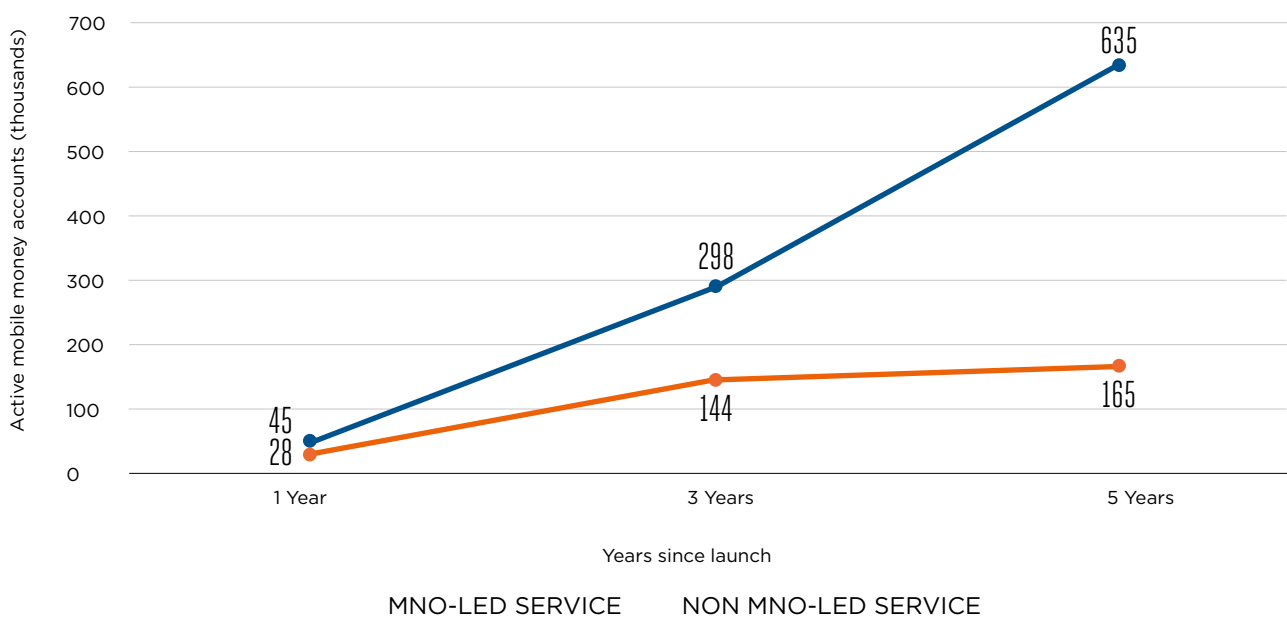
12. Please note that all figures are rounded to the nearest thousands.

We also found that within five years, the average MNO-led service reached 2.83% of the addressable market,[13] while a non MNO-led service reached only 0.53% of the addressable market.[14]

The results of a statistical regression analysis[15] were consistent—most findings were statistically significant at conventional levels: MNO-led services have a greater number of active mobile money accounts; have captured a greater proportion of the addressable market; and when looking at mobile money

transactions, process a greater value of transactions than non MNO-led services.

More generally, we also find evidence (albeit less statistically significant) from our regression analysis that at a macroeconomic level, MNO-led services are more likely to have mobile money transaction values which exceed one percent of a country's money supply. Figure 2 shows that by year 5, MNO-led services on average have a mobile money transaction value equivalent to 15.6 percent of a country's money supply, compared with 14 percent for non MNO-led services.

FIGURE 2

Growth of average mobile money transaction value for MNO- and non MNO-led services

MNO-LED SERVICE   NON MNO-LED SERVICE

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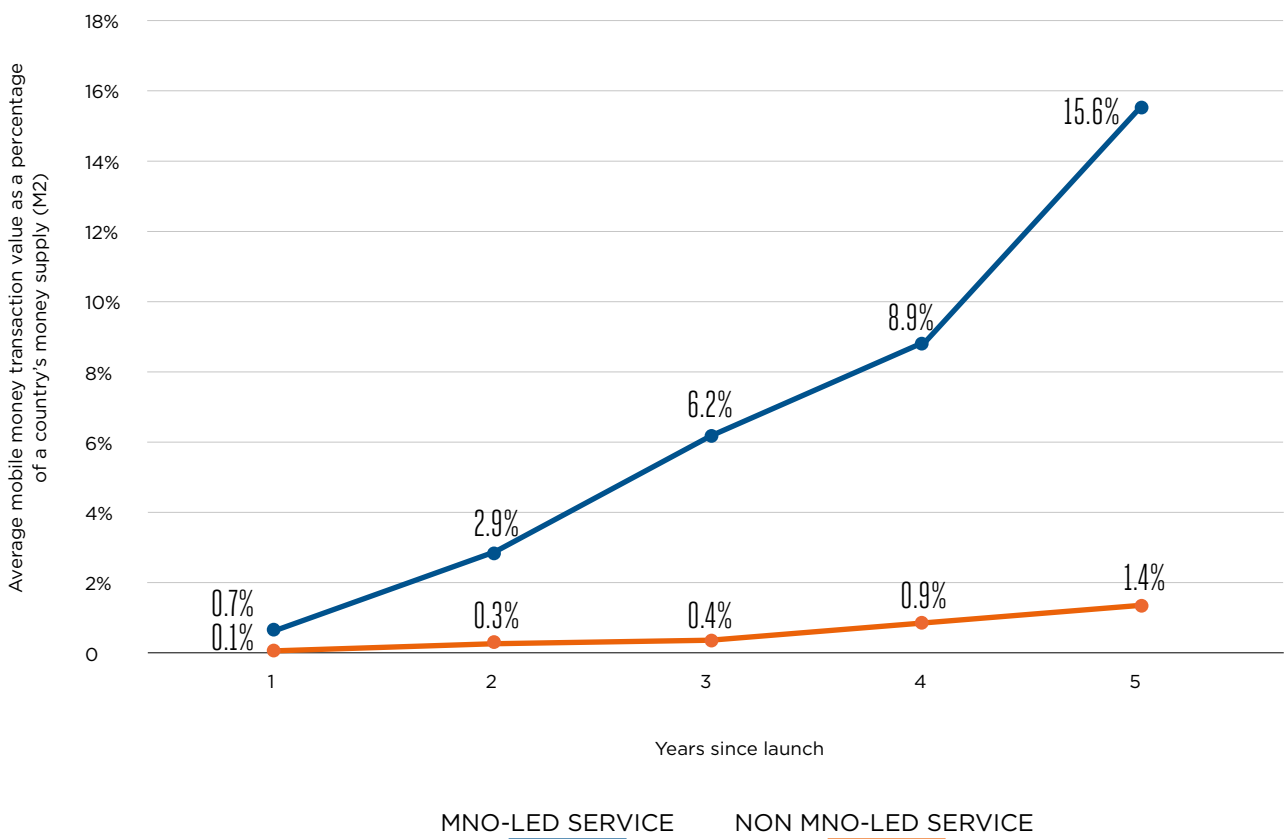
13. The percentage of active mobile money accounts as a proportion of unique mobile subscribers.

14. One challenge with the analysis in Figure 2 is that opportunities faced by MNO-led services may differ systematically from non MNO-led services. For example, if regulators in business-friendly countries permit MNO-led services, but those in countries in which it is very difficult to do business do not, this analysis risks falsely attributing the success of MNO-led service to the sponsor, rather than the business environment. Or, if MNO-led services have simply been running longer, we might mistakenly attribute to sponsorship what is rightly due to age.

15. Our regression analysis included a country fixed-effect. The fixed-effect absorbs any country-specific heterogeneity including differences in regulatory regime or legal framework, which allowed us to effectively compare an MNO-led service within a given country to a non MNO-led service in the same country.

16. Gilman, L. (2013). Mobile Money in the Democratic Republic of Congo: Market insights on consumer needs and opportunities in payments and financial services. GSMA Mobile Money for the Unbanked. Available at: http://www.gsma.com/mobilefordevelopment/wp-content/uploads/2013/07/Mobile-Money-in-the-DRC_July-2013.pdf

While this data provides evidence that MNO-led services tend to see greater success, it does not, however, allow us to explore why this might be the case. Leading hypotheses suggest that MNO brands are highly recognised and trusted, that they can more easily cross-sell mobile money alongside their existing voice and SMS products, that MNOs have more experience in building and managing large, low-cost distribution networks in unserved areas.[17]

It is worth noting that while our results demonstrate that MNO-led services have better chances of success, non MNO-led services such as bKash have made a remarkable impact on the financial inclusion in their country. bKash is a service in Bangladesh which is majority owned by BRAC bank and has partnerships with four major MNOs in the country, making the service accessible to 98% of the mobile subscribers. With 21.2[18] million users, bKash is the market leader with 62% market share in the country[19] and has played a significant role in building awareness for mobile money services in Bangladesh. However, majority of their users still rely on informal OTC transactions[20,21] and as a result, the great traction in their market is not reflected in the growth of their active accounts.

TEXT BOX 1

Assessing the average cost per mobile money transaction

While we are unable to estimate the profitability of mobile money services, our data does include reported mobile money revenue, and total transaction volume, from 145 providers. This allows us to construct estimates of the average cost to the user for using the service.

For this, we evaluated two metrics: 'revenue to volume', a proxy to cost per mobile money transaction and 'revenue to value', a proxy to value cost per dollar transferred.

Across all providers in our subset, the average 'revenue to volume' is USD 0.50, meaning the average cost per mobile money transaction is 50 cents. For MNO-led services, the average is substantially lower (USD 0.41) than for non MNO-led services (USD 0.90). For 'revenue to value', the average is 2.54%, a number that is similar to the typical interchange fee for credit cards. We again see a lower revenue to value for MNO-led services (2.06%) as compared to non-MNOs (4.28%).

We also compared these two metrics by whether the service is located in a country with enabling or non-enabling regulation. We see slightly lower 'revenue to volume' in countries with enabling regulation (USD 0.37) as compared to non-enabling regulation (USD 0.51), and a similar relationship holds for 'revenue to value' (1.28% vs. 3.08%).

The lower cost of MNO-led services suggests MNOs may be doing a better job at creating services that are accessible to low-income populations.

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17. Alexandre, C., Mas, I. and Radcliffe, D. (2010). Regulating New Banking Models that Can Bring Financial Services to All. Challenge Magazine, Vol. 54, No. 3, pp. 116-134, May/June 2011. Available at: http://ssrn.com/abstract=1664644

18. http://www.thebanker.com/Banking-Regulation-Risk/Bangladesh-s-bKash-revolution?ct=true

19. Ibid.

20. Greg Chen and Pial 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 Lynn Eisenhart, Nat Kretchun
Available at http://www.impatientoptimists.org/Posts/2015/04/Mobile-money-usage-in-Bangladesh-A-sidebyside-comparison-of-demand-and-supply-side-data#.V_I3TCErKWg

21. Informal OTC Transaction: A transaction is considered OTC when it is conducted by an agent's account on behalf of the customer. OTC can be offered formally, whereby the provider deliberately chooses to implement an OTC strategy for commercial and regulatory consideration. OTC can also emerge informally and organically, despite deliberate commercial and regulatory attempts to limit OTC.

First-mover advantage

Given the network economics associated with payment services, it is reasonable to wonder whether "first movers"—providers which are first in a market—have a subsequent competitive advantage in this space; or if instead subsequent entrants see more success. Our analysis found that there may be a first-mover advantage, to the extent that the first mover may capture a larger share of the addressable market, but we do not find robust evidence that first movers enjoy an advantage in terms of obtaining more accounts more quickly.

Such analysis is complicated by a variety of factors: entry into a market is not randomly assigned, and it is reasonable to expect that providers anticipating greater profit from mobile money both enter earlier and invest

more. Even setting aside concerns about causality, it is important to note that most countries in our dataset experienced rapid economic growth and a rapid increase in unique mobile subscribers over our sample period. Thus, early entrants experience a less welcoming environment than subsequent entrants.

Keeping these constraints in mind, we initially compared the success of services which were first to market with those which were second, third, or later to market. In all cases, the first movers have grown substantially larger (see Figure 3). One year after there are at least three entrants, the first entrant has, on average, 356,000 active mobile money accounts, against 121,000 for the second entrant, and 15,000 thousand for the third (or later) entrant. Five years[22] after a third mobile money service has entered, the difference is even starker.

FIGURE 3

Active mobile money account growth for first movers and subsequent entrants (years since launch of the third entrant)

Years since launch of the third entrant

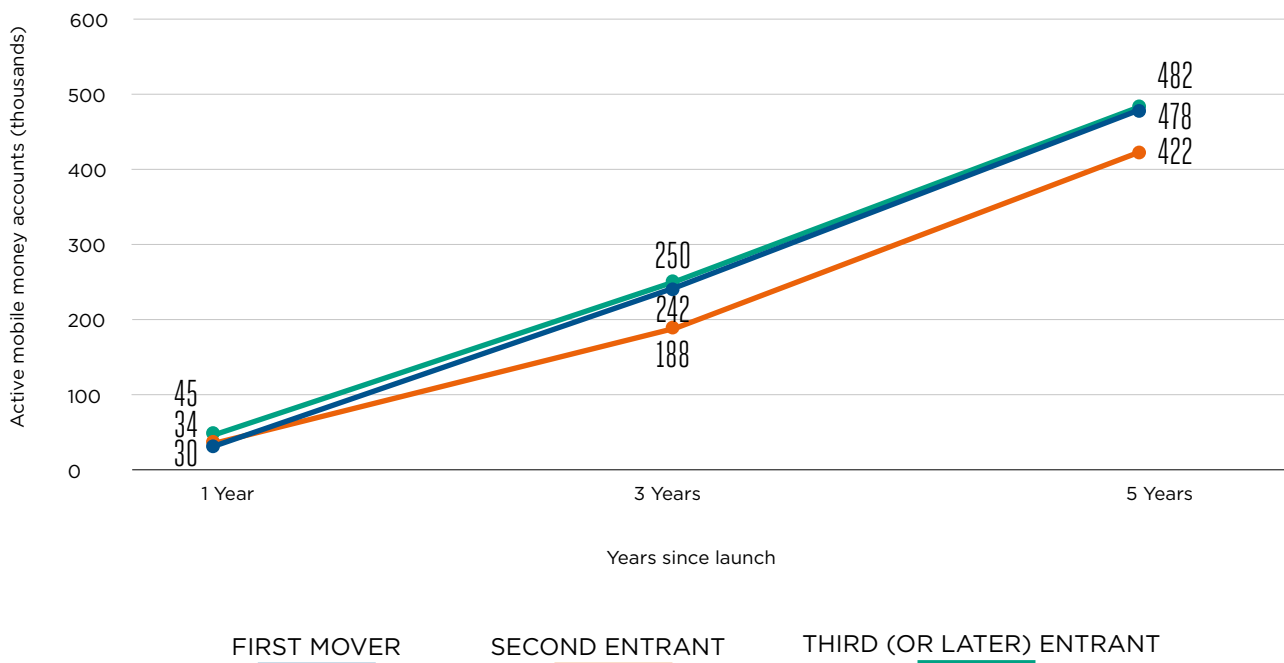FIRST MOVER   SECOND ENTRANT   THIRD ENTRANT

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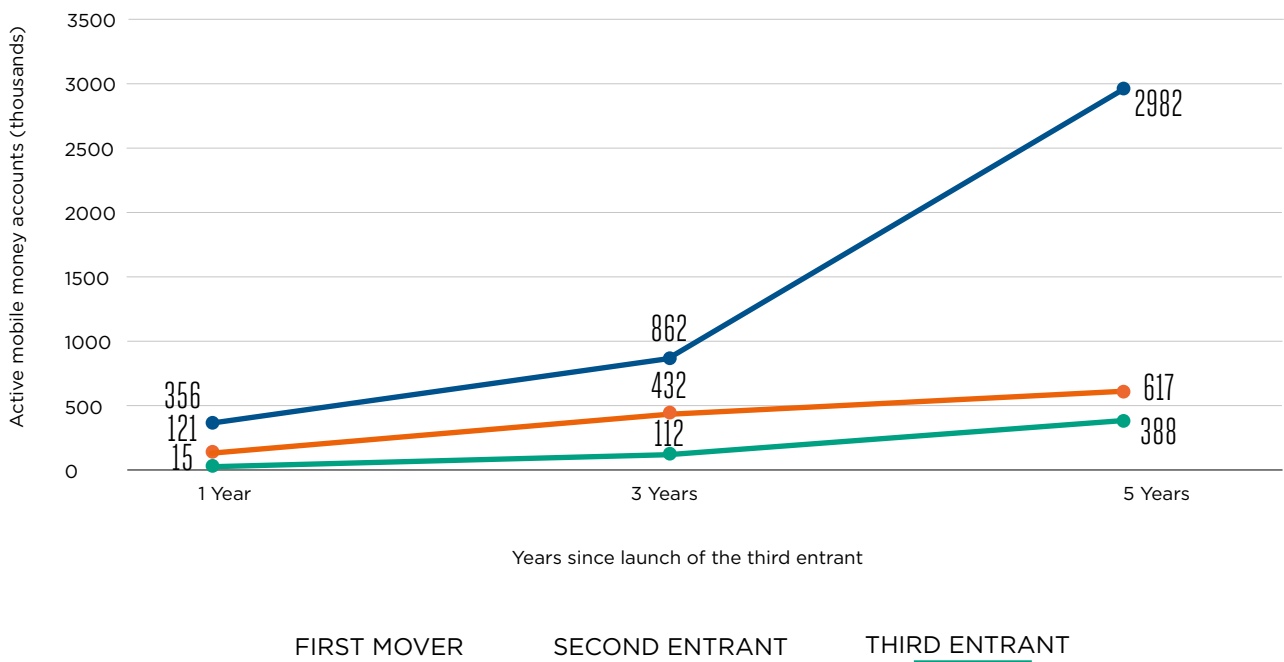
22. This five-year comparison relies on a small number of countries, as to date there are few markets in which three or more entrants were competing more than five years ago.

However, rather than compare mobile money services at a given point in time, we also evaluated how large each service had grown one year after launch (and three and five years after launch)—therefore comparing services that were the same age, though at different times. Here, the first-mover advantage disappears (see Figure 4): late entrants have an average 45,000 active mobile money accounts one year after launch, and 482,000 five years after launch; first movers see nearly identical numbers, with an average 30,000 active mobile money accounts and 478,000 active accounts, respectively.[23]

Active mobile money account growth for first movers and subsequent entrants (years since launch of the service)

FIRST MOVER   SECOND ENTRANT   THIRD (OR LATER) ENTRANT

When looking at how much of an addressable market a provider has captured, there is stronger evidence of a first-mover advantage: three years after the third entrant launches, the first mover enjoys 3.12% market share, compared to 0.31% for third or later. While the second entrant fares no worse than the first mover after three years, the first mover does enjoy larger market share five years after launch a service (2.36%), relative to a later entrant (0.69%).

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23. This five-year comparison relies on all countries.

Group-level advantage

We analysed whether providers whose operations span multiple countries may be particularly effective in developing mobile money services. Within our sample, just 20 providers operated in more than one country—with a presence ranging from two to 17 countries. MNO-led services are much more likely to launch multiple mobile money services, and all providers with more than six mobile money services are MNOs.

Our analysis found that group-level providers have achieved dramatically larger scale than single-service providers, with an average of 406,000 active mobile money accounts, almost 50% more than single-service providers (272,000). This is also reflected in the average market share, where group-level providers have an average market share of 2.9%, compared to 0.8% for single-service providers. We also found that mobile money services from group-level providers grow dramatically faster than services launched by a single provider: five years after launch, group-level providers obtained an average market share of nearly 4% of all mobile connections, compared to 1.1% for single-service providers (See Table 1).

TABLE 1

Single-service providers vs. group-level providers

	Single-service providers	Group-level providers
Average number of mobile money active accounts (thousands)	272	406
Average market share (June 2015)	0.8%	2.9%
Average market share 1 year since launch	0.22%	0.60%
Average market share 3 years since launch	0.6%	2.3%
Average market share 5 years since launch	1.1%	3.9%

Further, the difference in mobile money transaction value tends to be greater than the difference in the size of the customer base, suggesting that services from group-level providers attract more active, or perhaps relatively richer, customers.

Some multi-service providers with successful mobile money deployments have attempted to leverage early success by arranging meetings and learning sessions between staff from more mature deployments with those which are at earlier stage within their global network. Some even relocate successful managers to launch and manage a new mobile service in a different market.

Existing mobile connection market share

We examined whether MNOs with a large market share of mobile connections are more likely to succeed in the mobile money business. This indicator was the strongest and most stable predictor of success across outcomes: MNOs with the largest market share of

mobile connections were more likely to capture a greater proportion of a country's overall addressable market for mobile money. Evaluating the success of a service one year after launch, market leaders enjoyed a market share approximately thirty-five percentage points higher than second or smaller mobile operators.

This becomes even stronger if services are compared three years after launch. After three years, they have captured 68.9% of the mobile money market, and are twice as likely (16% vs. 8%) to achieve a large scale (more than 500,000 active accounts), relative to other operators.

Regulatory environment and the success of mobile money

Despite the great contribution by the mobile money industry towards changing the landscape of financial inclusion for underbanked and underserved people, there are markets where regulatory barriers make it burdensome for the industry to launch and scale services. While mobile money providers face a range of internal and external challenges, regulatory barriers are particularly important in that they may prove impossible for firms to overcome.[24]

The GSMA has long maintained that it is critical for regulators to create an open and level playing field for mobile money services, which will allow both banks and non-bank providers to offer these services. An enabling regulatory framework encourages competition and innovation, attracts investments from both banks and non-banks, and allows providers to focus on operational efficiency and accelerates financial inclusion. A 2012 analysis by the GSMA showed that there were 14 fast-growing mobile money services located in 10 countries at that time. Only two of these services were in countries where MNOs were not allowed to launch their deployments (either directly or through wholly-owned separate legal entities).[25]

In this paper, we use earlier work by the GSMA (2013),[26] which evaluated whether countries had "enabling" mobile money regulation. Factors used include whether MNOs and other non-banks were permitted to offer mobile money services; and the existence of tiered

KYC (or Know Your Customer) regulations, which allow low-value accounts to be opened with reduced proof of identity requirements (identity requirements may be difficult for the very poor to satisfy). Appendix B offers the detailed definition for enabling and non-enabling regulatory frameworks.

Our large-sample analysis found a systematic pattern when it comes to regulation: services located in countries which, as of 2015, had enabling mobile money regulations, were substantially more effective in "converting" unique mobile subscribers to mobile money services, and enjoyed significantly greater transaction volumes.

We found that though enabling regulation predicts fewer mobile money services in a market, it predicts a significantly greater mobile money penetration and transaction value. In countries with an enabling regulatory approach, we found the proportion of active mobile money accounts as a percentage of unique mobile subscribers was 2.2 percentage points higher, and the total transaction value (normalized by money supply) was 5.4 percentage points higher, as compared to countries with non-enabling regulatory frameworks.

This data supports previous research, which found that mobile money services have failed to succeed in countries that had relatively heavy regulation. For instance, research from the University of Chicago

24. Pénicaud, C. (2013). State of the Industry: Results from the 2012 Global Mobile Money Adoption Survey. GSMA Mobile Money for the Unbanked.
     Available at: http://www.gsma.com/mobilefordevelopment/wp-content/uploads/2013/02/MMU_State_of_industry.pdf
25. Ibid.
26. di Castri, S. (2013). Mobile Money: Enabling regulatory solutions. GSMA Mobile Money for the Unbanked. Available at:
     http://www.gsma.com/mobilefordevelopment/wp-content/uploads/2013/02/MMU-Enabling-Regulatory-Solutions-di-Castri-2013.pdf

observed similar characteristics where mobile money schemes had failed to ignite in certain countries from different parts of the world.[27] What was striking was that while these countries were at different stages of economic development, they all had regulatory frameworks that insisted on banks playing a central role and specifically required them to have significant involvement in mobile money services.[28]

An interesting market worth noting is Pakistan, where, despite a regulatory regime which does not permit non-banks to provide mobile money services, the number and value of mobile money transactions is growing significantly. The main deployment driving this growth is Easypaisa,[29] an MNO-led service offered by Telenor Pakistan through its majority-owned subsidiary, Tameer Bank. A majority of transactions in Pakistan are conducted OTC,[30] therefore the growth in number of registered and active accounts do not reflect the remarkable increase in the number and value of transactions in past few years.

Country-level factors associated with success of mobile money

In addition to the association between regulation and the success of mobile money, we also analysed other variables at the country level to better understand which contributed to the success of mobile money services.

Several patterns emerged from this analysis, which suggest certain country-level characteristics make a mobile money proposition more successful. These characteristics included:

- **Ease of Doing Business Rank:** We see much greater customer engagement (as measured by the percentage of active mobile money accounts as a proportion of unique mobile subscribers) in countries which rank above the median in the Ease of Doing Business Index. A higher ranking in the index—which ranks countries from 1 to 189—means the regulatory environment is more conducive to the starting and operation of a local firm.[31]

- **Account ownership at a financial institution:[32]** We observed an inverted "U" shape with respect to financial account ownership, where countries at the middle of this indicator witness the greatest success in terms of active mobile money accounts (See Figure 5). In countries with high levels of account ownership, the demand for the more basic bundle of financial services represented by mobile money may not be as high. On the other hand, in countries with low levels of account ownership, often factors such as highly restrictive regulation, limited availability of identity documents and/or a lack of infrastructure may affect the delivery of all financial services, including mobile money.

27. Evans, David S. and Pirchio, Alexis, An Empirical Examination of Why Mobile Money Schemes Ignite in Some Developing Countries but Flounder in Most (March 14, 2015). University of Chicago Coase-Sandor Institute for Law & Economics Research Paper No. 723. Available at: http://dx.doi.org/10.2139/ssrn.2578312

28. Ibid.

29. Branchless Banking Newsletter, Issue 18, Oct-Dec 2015, State Bank of Pakistan, Available at http://www.sbp.org.pk/publications/acd/BranchlessBanking-Oct-Dec-2015.pdf

30. Ibid.

31. Doingbusiness.org. (2016). Ranking of economies - Doing Business - World Bank Group. Available at: http://www.doingbusiness.org/rankings

32. "Low Ownership", "Medium Ownership" and "High Ownership" refer to the tertiles of formal financial account ownership.

FIGURE 5

Distribution of active mobile money accounts by level of formal financial account ownership[33]

Number of active mobile money accounts (thousands)

LOW OWNERSHIP   MEDIUM OWNERSHIP   HIGH OWNERSHIP
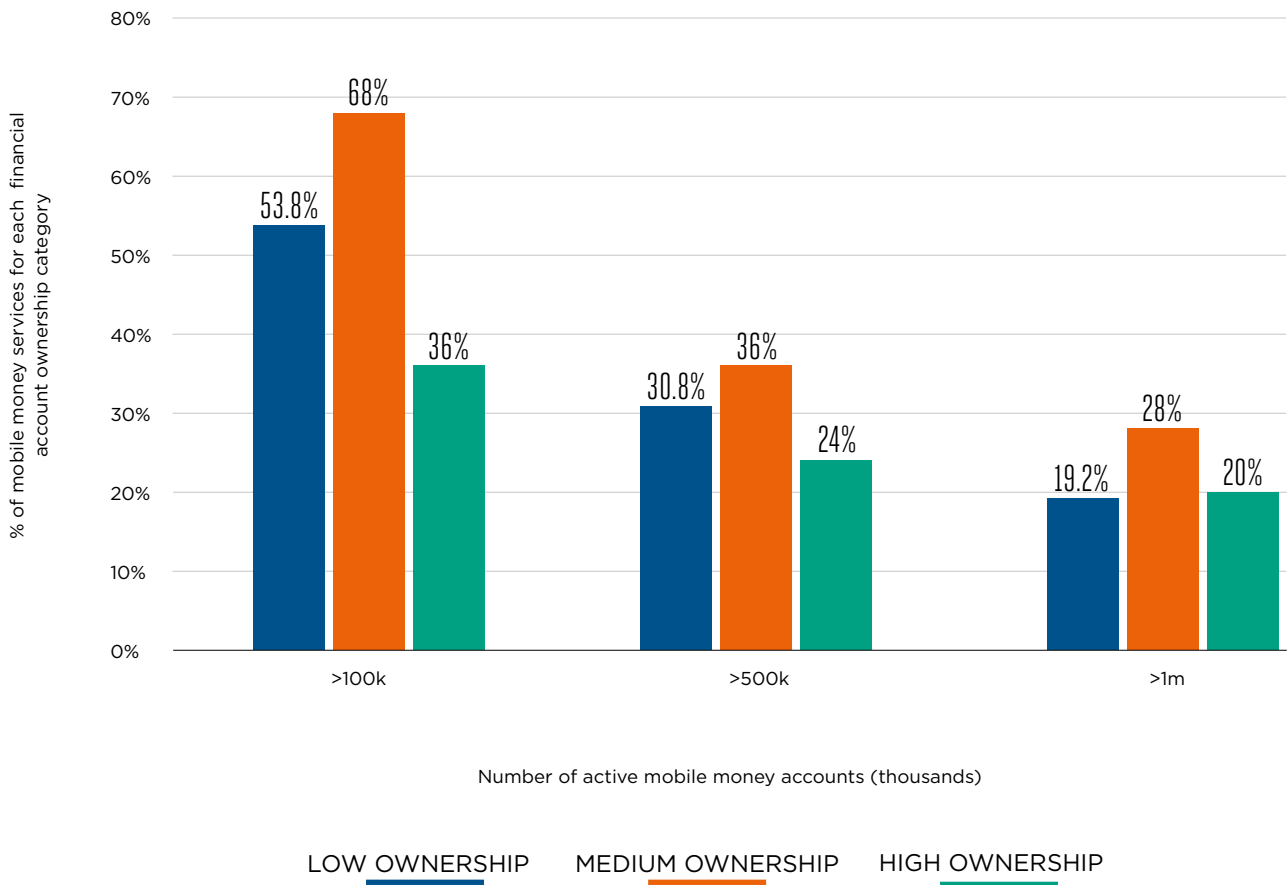
- **GDP per capita:** Mobile money services located in countries with a low GDP per capita see the greatest success. Our analysis found that these countries had the greatest number of active mobile money accounts, as well as the greatest percentage of active accounts as a proportion of unique mobile subscribers.

- **Population density:** A greater number of active mobile money accounts were observed in countries with high levels of population density. This may indicate that in countries with a higher population density it is easier for mobile money services to set up a viable agent network which assures the minimum number of transactions per agent is met.

33. Ibid

Conclusion

The growth of mobile money has increased substantially since 2012. To better understand the success factors for mobile money services, the GSMA partnered with Shawn Cole, a professor at Harvard Business School, and Jake Kendall, the Director of DFS Lab at Caribou Digital, to examine the relative importance of key business and market characteristics on the growth of active mobile money accounts, as well as mobile money transaction volumes and values through multi-variable regression analyses.

As the first-ever large-sample quantitative assessment of the expansion of mobile money, our analysis provides strong evidence that certain factors are associated with the success of mobile money services:

- MNO-led mobile money deployments have been much more successful in developing and delivering digital financial services with broad outreach than non MNO-led mobile money deployments.

- Enabling regulation is shown to be an important predictor of success in mobile money services.

- Providers whose operations span multiple countries capture a greater market share than single- service providers.

- The existing market share of mobile network operators predicts greater success in mobile money operations.

- The probability that a mobile money service scales significantly is greater in countries with high levels of population density.

- There is some evidence of a first-mover advantage, with first movers tending to gain the largest market share.

- Mobile money services located in countries with low GDP per capita see greater success.

- Countries with high levels of formal financial account ownership see relatively low mobile money prevalence, while countries with medium levels of account ownership see the greatest success.

- Mobile money providers were able to capture a greater percentage of the addressable mobile money market in countries which ranked higher on the Ease of Doing Business Index.

These factors are striking and suggest that an enabling regulatory framework, as defined by the GSMA, can promote the growth of the digital financial services industry, and that MNO-led services are better suited to offer digital financial services. Indeed, the spread of adoption of enabling regulatory frameworks will further extend the reach of financial inclusion, with services achieving greater scale and improving the lives of low-income population. We hope this quantitative assessment complements existing research on market- and firm-level characteristics behind the success of mobile money services.

Appendix A: Data limitations

We provide what we believe is the first-ever large-sample quantitative analysis of the expansion of digital financial services. However, we do note two limitations to this analysis:

1. We are not able to measure the profitability of services, as the Global Adoption Survey of Mobile Financial Services does not collect profit or loss data from service providers. Our primary metric of success is active mobile money accounts, though we also study the value and volume of mobile money transactions.

2. Our research design, by its very nature, prevents us from making causal claims. We are not aware of plausibly exogenous variation in country or market characteristics that would allow us to say definitively that, say, higher per capita GDP causes greater success in DFS space. Instead, we can only say that higher per-capita GDP predicts, or is associated with, greater success.

Appendix B: Data sources for analysis

This paper combines six complementary datasets collected by the GSMA, which we augment with publicly available data from the World Bank's World Development Indicators and the FINDEX Dataset.

GSMA Intelligence

GSMA Intelligence contains more than eight million individual data points on 1,140 Mobile Network Operators (across 3,505 networks) and 65 groups in 236 countries. The data is broken down into three broad categories covering subscriber connections, operational and financial metrics. Historical data is available from 1979 with forecast data for subscriber connection metrics running till 2020. We do not use the forecast data in our analysis.

GSMA Mobile Money Deployment Tracker

The GSMA Mobile Money Deployment Tracker is an online public database that monitors the number of live and planned mobile money services for the unbanked across the globe. Services that meet the definition set by the GSMA Mobile Money Programme are included in the online database. By the end of 2015, GSMA tracked 271 live services across the majority of the developing world which were meeting the below criteria:

1. A mobile money service includes transferring money and making payments using the mobile phone.

2. The service must be available to the unbanked, e.g. people who do not have access to a formal account at a financial institution.

3. The services must offer at least one of the following products:

   • Domestic or international transfer;

   • Mobile payment, including bill payment, bulk disbursement, and merchant payment; or

   • Storage of value.

4. The service must offer an interface for initiating transactions for agents and/or customers that is available on mobile devices.

5. The service must offer a network of physical transactional points outside bank branches and ATMs that make the service widely accessible to everyone.

6. Mobile banking services that offer the mobile phone as just another channel to access a traditional banking product are not included.

7. Payment services linked to a traditional banking product or credit card, such as Apple Pay and Google Wallet, are not included.

GSMA Global Adoption Survey of Mobile Financial Services

The GSMA Global Adoption Survey of Mobile Financial Services is an annual survey designed to capture quantitative information about the performance of mobile financial services around the world. Every year, service providers represented in the GSMA Mobile Money Deployment Tracker are invited to participate in the Global Adoption Survey. The GSMA Mobile Money team started this survey back in 2011 and in this study, the survey data collected between 2011 and 2015 is utilised.

The survey captures information across six different key areas: General Information, Regulation, Customers, Products, Distribution, and Investments and Revenues. Detailed definitions for each metric is provided in the Appendix.

The survey collects a combination of quarterly and monthly data. Throughout the paper unless otherwise specified, we use data from the fourth quarter of each year as the annual number for metrics related to accounts and agents. We use the data from the month of December for the value and volume of transactions. The data appendix provides the precise reporting cycles of different metrics.

Data Completeness and Accuracy

The GSMA Global Adoption Survey aims to capture every mobile money service around the world that meets the criteria given above. To that end, the team maintains a listing of every live service provider that they are aware of, in the Mobile Money Deployment Tracker. In-depth reviews of the Tracker are done on a quarterly basis. The deployments captured in the Tracker are cross-checked with other stakeholders in the industry such as vendors, MNOs, IMT partners and other stakeholders such as World Bank and UNCDF. This provides us with a high degree of confidence in the information captured, however as the mobile money industry evolves rapidly, with new service launches and service closures, there is a slight chance our dataset misses the latest available information on small services for which there is no publicly available information. We believe these instances are quite rare (such instances account for less than 2% of deployments being tracked on annual basis), and should not materially affect our analysis.

A second potential source of bias is participation in the survey itself. GSMA Mobile Money team reaches out to all live services to improve the representability of the survey data. Over the past five years, providers' interest in survey participation has increased, and survey response rate in 2015 was approximately 40%. We believe the impact of non-responses on the quality of data collected is low, as most services that are either successful or devote meaningful resources to the business do choose to participate. Survey respondents receive a confidential Benchmark Report, which assesses the performance of their service against their peers at a global and regional level, across over 20 industry indicators. This provides a significant incentive for providers who have been successful in launching and delivering mobile money services to participate, as they are eager to learn about their services relative to their peers. Furthermore, providers who are in the early years of running a mobile money service benefit from the Benchmark Report's insights on how to improve their operational efficiency, including customised advice from the GSMA team. For services that do not report outcomes directly to the GSMA, the GSMA research team uses any publicly available data, new sources, and interviews with industry actors to create estimated figures. This is further explained in the next section.

As with most supply-side datasets, the GSMA's mobile money adoption data is self-reported by providers, and is not independently audited. The GSMA Mobile Money team undertakes multiple steps to ensure the validity and integrity of the data. All submitted data has thoroughly been checked for correct and consistent calculations (e.g., ensuring that customers who have not been registered but perform transactions over the counter are not counted as part of registered accounts), and definitions (e.g., only domestic transfers between two customer accounts (not business-to-business) are reported as P2P transfers). Checking and cross-examining the survey data is carried out in three different stages:

1. Investigating the historical trends and flagging any major fluctuation in the reported data relative to the submission from previous years

2. Examining the average number and value of transactions for different products and comparing this against regional and global benchmarks

3. Cross-checking the submitted data against reported figures by Central Banks, telecom regulators, the Global Findex database, and other public sources

Any discrepancies flagged as part of the above process were returned to the survey respondent for further clarifications. This gives us a high degree of confidence in the data we use for our analysis. However, some respondents may never further clarify the reported data, in which case, these data points are marked as an outlier and will be excluded from the analysis. This is relatively rare, such instances account for less than 1% of our data.

GSMA Mobile Money Estimates & Forecasts

In 2013, the GSMA's Mobile Money team began to develop a statistical model to estimate and forecast mobile money indicators at the global, regional and country level. This helped in the generation of aggregate numbers for studies of global adoption. The estimates for mobile money indicators are developed at the services level. The methodology used to model these metrics is based on a mix of bottom-up (service level) and top-down (country level)

approaches. A number of data sources, including the Global Adoption Survey of Mobile Financial Services, the GSMA Mobile Money Deployment Tracker, central bank & telecommunications regulator reports, and the International Monetary Fund's (IMF) annual Financial Access Survey (FAS), are used in the estimates and forecasts models. The actual formula used for predictions is proprietary.

Estimates and forecasts for mobile money metrics are developed at the service level and the numbers are then aggregated at the country and regional level. For mobile money services with historical data available, growth until December 2015 is developed based on this data, trend analysis, and analyst judgement. For mobile money services that do not have historical data available, performance on each metric is developed based on country and regional benchmarks, GSMA's internal market expertise, as well as tailored assumptions about the service's future growth.

GSMA Mobile Money Regulatory Tracker

In 2013, the GSMA began to characterise countries as having an "enabling" or "non-enabling" regulatory approach. The GSMA defines an "enabling regulatory approach"[34] for mobile money as one in which the rules established by the regulator:

- Permit non-banks to issue electronic money (or equivalent) by allowing them to:

  - be licensed directly, OR

  - set up a subsidiary for this business, OR

  - apply for a payments bank (or equivalent) license, OR

  - provide the mobile money service under a letter of no-objection to the non-bank or its partner bank, pending the approval of a specific regulation,

- Imposes initial and ongoing capital requirements that are proportional to the risks of the e-money business,

- Permits them to use agents for cash-in and cash-out Operations,

- Does not prescribe the implementation of specific interoperability models without allowing for a market-led approach.

The Mobile Money Regulatory Tracker provides three snapshot views of the regulatory approach of countries with live mobile money services in 2013, 2014 and 2015. The year when the regulation became enabling is not captured in this tracker, but the regulatory status of every country with a live mobile money service has been tracked since 2013.

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34. Simone di Castri (2013), "Mobile Money: Enabling Regulatory solutions", GSMA Mobile Money for the Unbanked.
   Available at http://www.gsma.com/mobilefordevelopment/wp-content/uploads/2013/02/MMU-Enabling-Regulatory-Solutions-di-Castri-2013.pdf

Appendix C: Definition of metrics collected by the Global Adoption Survey of Mobile Financial Services

Metric	Definition
Registered customer account	The cumulative number of customer accounts that have been opened as at the end of the months indicated. Customers who have not been registered but perform transactions over the counter SHOULD NOT be counted.
Active customer account	The number of customer accounts that have been used to perform at least one P2P payment, bill payment, bulk payment, cash in to account, cash out from account, or airtime top up from account for at least one of the time periods indicated below. Balance inquiries, PIN resets, and other transactions that do not involve the movement of value SHOULD NOT qualify a customer account as active.
Unregistered customer	Customers who use your service Over The Counter (OTC) as well are recipients of off-net transfers.
Over the Counter (OTC)	Over the Counter customers transact using agents for bill payment, P2P transfers, bulk payments and International remittances.
Registered agent outlet	The cumulative number of transactional outlets that have been registered as at the end of the months indicated.
Active agent outlet	For the purpose of this survey, active agent outlets are defined as outlets that have facilitated at least one transaction within the past 30 days.
Domestic on-net P2P transfers	Domestic transfers that were made between two customer accounts.
Outbound off-net/ cross-net transfers	Domestic transfers to unregistered users with vouchers or into the mobile wallet of a different mobile money provider where wallet-to-wallet interconnection is available.
International remittances	International transfers that were made between customer accounts, regardless of whether they originated from an account or were made over the counter.
Bills payments	Payments of bills using mobile money, regardless of whether they originated from an account or were made over the counter.
Merchant payments	Movements of value from a customer to a merchant to pay for goods or services at the point of sale using an account.
Airtime top-ups	Airtime top-ups funded from customer accounts. Purchases of airtime that are funded by OTC payments SHOULD NOT be included.
Bulk payments	Bulk payments such as salary payments, government or NGO transfers, regardless of whether they terminated in an account or over the counter.
Cash-ins	Cash ins to customer accounts. Over-the-counter P2P payments, bill payments, or airtime top ups SHOULD NOT be included.
Cash-outs	Cash-outs from customer accounts. Over-the-counter collection of bulk payments or P2P payments SHOULD NOT be included.

For the full report please visit the GSMA website at www.gsma.com