Mobile Money: Implications for Emerging Markets (*)

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Abstract: Developing countries lack effective infrastructure: transportation, telecommunications, financial systems, etc. The positive economic impact of the improved telecommunications infrastructure has been demonstrated. The ability of microfinance has been shown to stimulate and enhance economic activity. Now a hybrid of the technologies has begun to emerge: mobile money. The ubiquity of cell phone service, coupled with the notion of microfinance offers the possibility of service in remote areas of a country where it would be otherwise economically unsustainable to provide banking services. Mobile money has all of the attributes of money including store of value and medium of exchange. This paper addresses the economics and policy issues of mobile money: What are the economics of mobile money? What policy issues does it raise? Is it a threat to the traditional banking system? How should it be regulated? What can we learn from the microfinance literature? Do we have empirical evidence of its impact on growth and development?

Key words: Competition, economic dynamics, neoclassical economics, pricing policy, regulation.

It goes without saying that developing countries lack effective infrastructure: transportation, telecommunications, financial systems, etc. Most recently, the growth of cellular telephone service has helped ameliorate one of these bottlenecks by bypassing the traditional fixed line service. In all developing countries, the number of mobiles far exceeds the number of fixed line phones.

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The positive economic impact of the improved infrastructure has been demonstrated. Concurrently, the ability of microfinance has been shown to stimulate and enhance economic activity. Now a hybrid of the technologies has begun to emerge: mobile money. The cell phone serves as a bank account, debit card, and money.[1] The ubiquity of cell phone service, coupled with the notion of microfinance offers the possibility of service in remote areas of a country where it would be otherwise economically unsustainable to provide banking services. Mobile money has all of the attributes of money including store of value and medium of exchange. Mobile money replaces the inefficiency of barter and the problem of the "double coincidence of wants." Just as with currency, security and counterfeiting will be issues. Kenya already has nearly seven million or 38 percent of its cellular customers using a mobile money system (*Economist,* 2009c). Other countries are using mobile money systems.

This paper addresses the economics and policy issues of mobile money, particularly from the perspective of emerging markets: What are the economics of mobile money? What policy issues does it raise? Is it a threat to the traditional banking system? How should it be regulated? Has it demonstrated any economic impact yet? What can we learn from the microfinance literature? Do we have empirical evidence of its impact on growth and development?

The paper is organized as follows: Section one is this introduction. Section two briefly reviews the role of money and banking in the society, section three addresses the use of mobile money, how it has been implemented, its successes and failures in emerging markets. Section four examines and analyzes the impact of mobile payment systems. Section five concludes.

[1] In this article, the reference is to generic mobile money and mobile payments for examining the regulatory and policy issues. Namely, mobile money/payments are financial transactions preformed with a contactless mobile device which can perform banking services: depositing, holding or releasing funds for cash, point of sale purchases, etc. The taxonomy of mobile money and electronic payments is briefly developed in PERNET-LUBRANO (2010) and more completely in BLEYEN *et al*. (2010), both in this issue of *COMMUNICATIONS & STRATEGIES*.

■ Role of money and banking

Traditional money and banking texts describe four functions of money: A store of value, a standard or unit of account, a standard of deferred payment and a means of payment or exchange. It is the latter function we will concentrate on in this paper. In the developed world, we never think about this role it is so familiar, but in moving from a barter to an exchange economy, it has major significance. It eliminates the major problem with barter – the double coincidence of wants. That is, finding a farmer willing to exchange goat for wheat. Clearly, money facilitates commerce.

In turn banks and similar financial institutions facilitate commerce by several means. Their role is to provide a safe place to keep money with savings accounts, to loan money to qualified applicants and provide demand deposits or checking accounts. It is this latter function which is the major portion of money supply in the developed world. People do not carry large amounts of cash with them but write checks to pay bills. But since people do not exhaust their accounts, the balance in their accounts is the equivalent to having cash (paper currency). For example, in the United States, demand deposits represent fifty percent of the money supply.[2] Debit cards serve a similar function, also a banking service. Credit cards do not represent "money in the bank" but are a service provided by banks.

Because of their major role in the financial infrastructure, these institutions are usually regulated: savings accounts are insured and guaranteed by government. The regulator requires reserve requirements based on the magnitude of the savings and demand deposits, etc. The credit/debit card system generates fees from both the users of the cards and the retail merchants that accept them. In the US, the latter fees are two to three percent (2-3%) of the purchase price. The card system represents a quasi-monopoly controlled by the banks.

A mobile-payments system represents a threat to the current system in the developed world. In the evolving economies, it represents the possibility of instituting a financial infrastructure that has heretofore not existed. It is to this we now turn.

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[2] Several different measures of the money supply exist basically depending on the liquidity of the source. Demand deposits are included in the so called M1 supply; saving accounts (time deposits) in the M2. See http://www.ny.frb.org/aboutthefed/fedpoint/fed49.html.

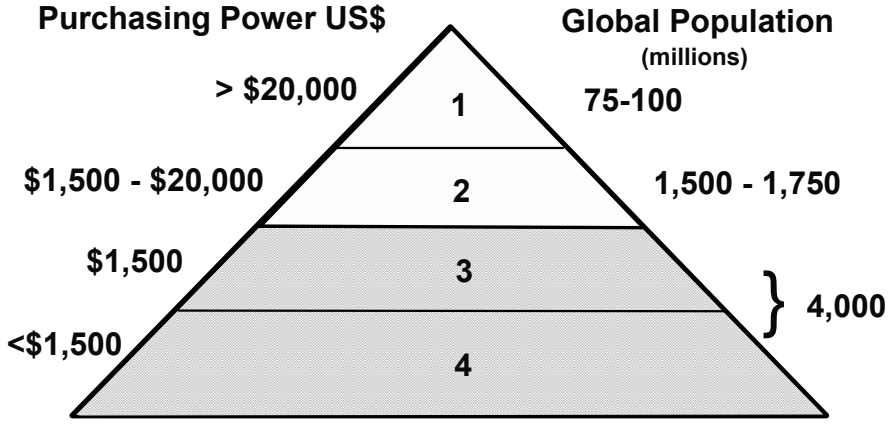
■ Mobile Money

Overview

E-Commerce has been accepted for more than a decade in the developed world. Consumers easily do purchases, ordering, reservations and a variety of tasks, including banking services over the internet. E-payments have seen broad consumer acceptance. However, the infrastructure in the developing world does have the ubiquitous internet or fixed line telephone service to support such services. In the developing world these e-payments have simply not been viable. In these emerging markets, over one billion people do not have a bank account, but do have a mobile phone (PERLMAN, 2010).

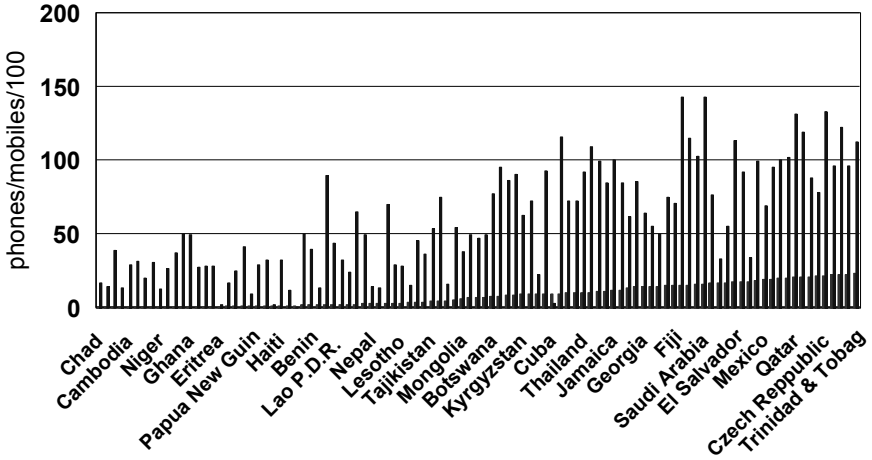
Figure 1 illustrates the distribution of income as a pyramid; the green portion represents the so called "base of the pyramid" (BoP) or the four billion people who have a purchasing power under $1,500 a year, the bulk of whom have less than four dollars a day to live on.

Figure 1 - The Global Pyramid



However, over the last decade, mobile phones have become omnipresent, far surpassing fixed-line service, as shown in Figure 2. Consider that there are "four billion mobile phone subscribers globally, with two-thirds of them living in the developing world" (Grameen Foundation, undated).

Figure 2 - Cellular phones *versus* fixed line per 100



Source: ITU data and authors' calculation

> "The mobile phone is a more affordable and integrated access vehicle than the individual pieces of equipment (wireline phones, television sets, computers, set-top boxes and modems, and satellite dishes/receivers) that wireline technologies require." (BANERJEE, 2010)

Implementation

Thus, the mobile phone has the potential to fill the gap in the financial infrastructure.[3] Indeed, it is already being used in various countries, the best known of which is Kenya. It has nearly seven million or 38 percent of its cellular customers using a mobile money system (*Economist,* 2009c). And this figure is growing rapidly (PERLMAN, 2010). Other countries are using or planning to use mobile money systems, but generally, government will desire new rules and regulations.

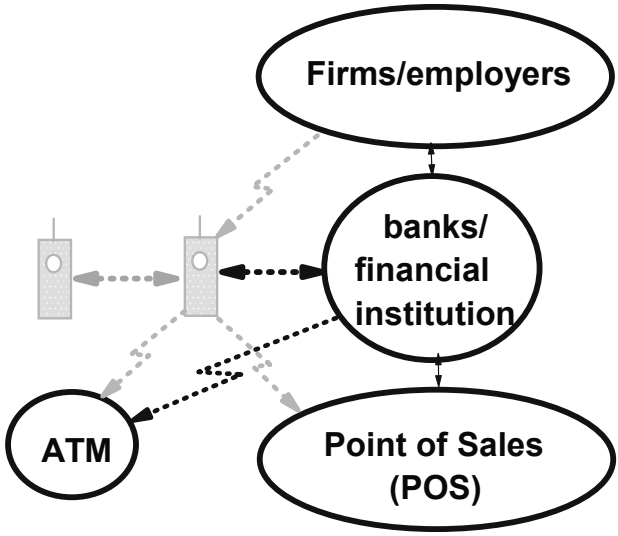
Other incentives are already under way in South Africa: Zambia, Pakistan, Maldives and the Philippines (PERLMAN, 2010). The Grameen Foundation is "[…] launching a Mobile Money initiative to explore how

3 The gap in the microfinancial infrastructure has been recognized as an element in reducing poverty. For example, the Consultative Group to assist the Poor (CGAP) has been established by the World Bank Group "– to help develop a sustainable microfinance industry – "(CGAP, 2008).

microfinance institutions could conduct transactions with clients via mobile phones, while also enabling poor and unbanked populations to use the service to send money to relatives and receive payments for goods and services." (Grameen Foundation, undated).[4]

Figure 3 illustrates how the system would work. Firms and employers can electronically transfer money to a bank or other financial institution which in turn can credit the employee's or merchant's account. A customer of the bank can withdraw money from his/her account via an automatic teller machine (ATM) or pay a retailer from his/her bank account via a debit card. With mobile money, the funds are transferred to the mobile phone. It can then be used to obtain money from an ATM (actually, an agent acts as a human ATM, such as the M-Peas system in Kenya).

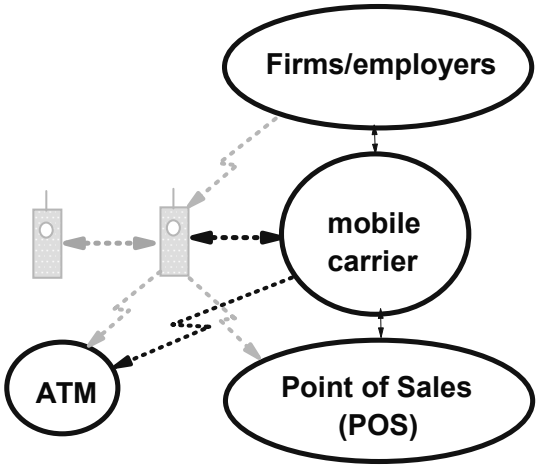
Figure 3 - Financial Transactions with Mobile money



It would be possible to send funds directly to the mobile phone. In this case, the mobile provider functions as a bank as shown in Figure 4.

4 On the other hand, “Some 119 mobile money services will be launched in developing countries by the end of 2010, but less than 10% of these systems are expected to be sustainable.” (PERLMAN, 2010)

Figure 4 - Financial Transactions with Mobile Carrier as Bank



This has profound implications if the mobile company can serve as a bank.

Mobile banking in the developing world requires the ability to make small transactions inexpensively. This in turn requires low transaction costs. The danger is that the banks may not be responsive to these needs of this market.[5] This is the opportunity for the mobile providers to perform this function and to serve the unbanked.

Because mobile providers have a far broader reach than the banks in the developing world, these services have a potentially ubiquitous reach.[6] The mobile device could become "the Swiss Army knife of communications/finance/data" (BANERJEE, 2010)

[5] One of the authors recently transferred a small sum of money from the United States to Italy. The cost was over twenty-five percent (25%) of the amount transferred. These charges are excessive, but particularly for an immigrate worker in the Middle East that is transferring funds to his family in Pakistan or India, for example.

[6] In the developed world mobile money could have the potential to break the credit card companies hold on retail transactions and create real competition to the banks.

■ Impact of mobile payment systems

Literature Review

Microfinance contribution to growth and development

Microfinance consists of financial services such as savings, credit programs, and financial services generally to the BoP. Generally this strata does not have the formal financial sector available to them. The poor may not be without resources, however, but these may be limited or very costly such as money lenders. Microfinance has the potential to fill the gap. The best known institution providing such services is Grameen Bank founded by Muhammad Yunus in 1976, although thousands now exist (BRAU & WOLLER, 2004).

Since others have covered this literature, we will not undertake a comprehensive examination of this literature but cite two such studies. In a comprehensive review of academic articles on microfinance institutions and their impact, BRAU & WOLLER (2004) found that the majority of the literature supports the view that microfinance contributes to economics growth; however, the results are highly contextual. Similar results are found by SENGUPTA & AUBUCHON (2008), although not as comprehensive as the Brau and Woller. It should be noted that it is not just micro-credits that are important, but micro-saving can make important contributions to the unbanked. One of the findings of these studies is that the key to microfinance is low transaction costs of issuing and servicing these loans. Other research has shown that access to financial services among the poor can aid poor households to increase their incomes and productivity. The demand for reliable, secure and convenient financial services is high. (GATES FOUNDATION, 2009).

Information and communications technology (ICT) contribution to growth and development

The link between economic growth and development has been studied for decades. The authors were involved in this research in the early nineties (ALLEMAN *et al.,* 1992). Our review of the literature at that time showed a general consensus that communications contributed to economic growth and development. Our work showed that telecommunications was both a cause

and consequence of growth. The technology has changed dramatically since then, but this has only amplified and accelerated the ICT's impact on development. More recently studies have once again confirmed that the availability of ICT can improve productivity and growth in the developing world.

ROLLER & WAVERMAN study (2001) is among the classic studies of the relations between ICT and growth. The results of the more recent studies of this type are summarized in ITU (2010).

Thus, the combination of enhancing the financial infrastructure via mobile money available on cellular service offers the possibility to amplify the contribution of each. Currently, no empirical studies have been undertaken to show the strength of these relationships. This is a subject of future research. However, until such studies are undertaken we can conjecture the benefits of mobile money. We now turn to this task.

■ Economics impact/importance

Benefits

Several benefits accrue with the combination of cellular and financial services: it enhances commerce, it allows for microfinance, it allows ease of remittances, it offers security that cash does not and, possibly, it could serve as a replacement for debit and credit cards. It will provide banking services for the unbanked.

Commerce is enhanced because it becomes much easier to pay for goods and services by the use of the mobile phone. There is no need to go to a bank to withdraw money, it is in the phone. Moreover, the targeted population does not have a traditional bank account. The phone "holds" the funds, just as a conventional saving or checking account would. A reversal of the process allows it to receive funds. The phone is the bank!

Individuals can remit money to their families either in the rural areas of the country or remit funds to their country of origin. They do not have to travel the distance or rely on a courier or other means to get their money to

their family. Thus, it saves time, is more secure and less expensive.[7] The functionality of mobile-payments is exactly like a debit card. Money is debited from your (phone) account, just as a debit card would debit your bank account. To the extent the mobile provider, or a third party leader, would like to extend credit to its customers, the phone would act exactly like a credit card. In this manner a micro-financial institution could advance funds to qualified individuals. As the service develops undoubtedly many other uses of these mobile-payments will emerge.

Policy issues

Several policy issues arise from mobile money. The macroeconomic issues we will address are the threat to the traditional banking system by mobile money and what are the implications. We will then discuss the possible regulation of mobile money.

Within the payments system, dispute resolution will be an issue. Since many players are involved: the mobile operator, the financial institution, perhaps payment intermediaries and others; how will disputes be resolved among the players? Who will be responsible?

Will traditional banking laws apply to mobile money? What role will the communications and/or consumer affairs authorities have in the control of the transaction?

Finally, just as the cellular companies constrain competition by preventing their handsets from operating on other networks, mobile money providers have little or no incentive to have interoperability among their payments system. It maintains the service provider's market dominance and constrains e-commerce. Inter-country transactions are even more adversely affected.[8] These issues, *inter alia*, must be addressed.

The issues of security are also critical. How are lost, broken or stolen phones handled? How can the phone be secured to ensure that a stolen phone is not depleted of its funds? Is password protection sufficient? How

[7] The cost of the international remittances, as previously noted, is expensive when sent through a traditional bank. Cellular service should be able to provide this service at a fraction of the cost.

[8] We would like to thank an anonymous referee for drawing our attention to these last three issues.

can the phone be secured from others "hacking" into it and depleting the account? These are serious questions that must be addressed, but are beyond the scope of this paper.[9]

The threat to the banking system could be either a positive or negative. If the banking system has enough political power, it could delay or usurp the mobile money system, resulting in slower service, restriction on the functions, etc. even though the banks would be headquarters in the urban areas. On the other hand, if the mobile players are strong enough or the banks do not have political clout, mobile money could provide much needed competition to this sector. It could reduce the inappropriate charges for remittances; reduce debit and credit card fees to POS retailers, etc. The introduction of this competition would be a powerful force for growth.

Thus, for growth and development, regulations should be light-handed; certainly no more odious than what is applied to the banking system in the country. Regulation should address security issues, usury, etc. in addition the regulation should impose capital requirements to the extent cellular carriers perform a credit function.

■ Conclusion and further research

E-payments via cellular service can serve the underserved, with secure financial services. The key issues will be the distribution and low prices/transaction costs. Small transactions must be able to be completed inexpensively. The advantages of mobile money are the efficacy of the payments system namely, all the advantages of money as a store of value and means of exchange but with less reliance on cash, which can be very beneficial when security is an issue. Remittances – both internal and international will be key in most developing countries because of the emigrant workforce, either urban migrants to the city sending money back to their families in rural areas or international migrants sending money back to their families in their home county. To date, these migrant workers (& families) are "unbanked" – they have no bank accounts or credit cards. But

9 Others have been looking at this issue. See, for example, STREFF (2010), LANDAU (2010) and NAHARI (2010). The OECD (2009) is in the process of reviewing its electronic guidelines of 1999 to consider mobile issues of security, consumer fraud, payment protections, etc. This report is due at the end of 2010.

providing financial service does have a positive economic impact on the economy.

Improved communications with mobile phones can aid in economic growth and development, but developing financial services via the mobile phone at affordable rates to the Base of the Pyramid (BoP) can amplify these impacts. Income, employment and individuals can benefit from this hybrid. It represents a huge, growing, and untapped market. If handled correctly it can be a sea change in emerging markets. Moreover, it has the potential to enhance competition in the banking sector. We predict a huge market will fuel and accelerate the anticipated explosive growth of m-money based on communications services in emerging markets worldwide. We believe that this hybrid system of mobile devices and microfinance will have a transformative effect on the developing countries economies.

Stay tuned...

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