Mobile, Financial Inclusion and Development: A Critical Review of Academic Literature

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ABSTRACT

With the flagship success of m-Pesa, mobile devices have become an important tool to facilitate financial inclusion of the previously unbanked population in developing countries. Attempts to provide a landscape of academic research findings from a critical perspective has been rather scant. To fill this gap, this study conducts a systematic review of 54 academic research papers *vis-à-vis* the nexus of mobile, financial inclusion and development. The result shows that the extant literature addresses three major clusters of topics including delivery, environmental factors, and impact of mobile financial services. Still in the nascent stage of research, the topics covered in the literature indicate a skewed balance towards delivery-related issues in a technology-oriented perspective rather than their linkages to financial inclusion and broader socioeconomic development. The choice of research methods also shows a limited variety and depth. This research contributes to understanding the current research on mobile financial services for financial inclusion in developing countries, and finding out research gaps for future study.

Keywords: mobile financial service, financial inclusion, development, access to finance, mobile phones, developing countries

I.   INTRODUCTION

Financial inclusion, the provision of financial services at affordable costs to the disadvantaged and low-income segments of society, has been recently considered as one of the major enablers of economic development (Muzigiti et el., 2013; The World Bank Group, 2017).   However, about 2 billion adults internationally have no access to financial services delivered by formal financial institutions (Muzigiti et el., 2013). At the 2015 World Bank Group-IMF Spring Meetings, global multi-stakeholders across the public and private sectors pledged a commitment to help promote financial inclusion and announced a new global development goal of achieving Universal Financial Access by 2020 (UFA 2020).

Notably, mobile devices have become an important tool to promote financial inclusion of the previously unbanked population in developing countries. Owing to its unique features such as mobility, always-on availability and personalized small devices, mobile phones were rapidly diffused not only in developed countries but also in most developing countries overcoming geographical and socioeconomic barriers. However, while an increasing number of mobile-based financial services (MFS) are being implemented, many of them are far from reaching a stage of sustainable value and profit, as they fail to offset the cost of setting up infrastructure and maintenance (Evans et el., 2014).

In the context of proliferating MFS initiatives and their frequent failures, mobile-based financial inclusion became a topic of scholarly interest over the last decades. A growing number of academic researchers examine the issues surrounding the interplay of mobile, financial inclusion and socioeconomic development in developing countries. Yet, there have been scant attempts to provide a systematic overview of academic research findings from a critical perspective. A critical evaluation of the existing findings is essential not only to facilitate the diffusion of mobile financial services, but also to identify key success factors affecting the interplay of mobile, financial inclusion and socioeconomic development for academic discussions and practice. To fill this gap, this paper reviews and synthesizes existing academic literature at the nexus of mobile, financial inclusion, and development, and draws out key issues and research gaps within the extant MFS literature.

The rest of the paper is organized as follows. In Section 2, we explore the interconnection of the three key concepts of mobile, financial inclusion and development in the existing literature.

Section 3 examines the research methods and approaches used in the literature, followed by the detailed results of our analysis in Section 4. We identify key factors and research gaps in Section 5 and conclude with suggestion for future research in Section 6.

II. MOBILE, FINANCIAL INCLUSION AND DEVELOPMENT

2.1 Mobile and Development

There is a plethora of research that examines the positive impact of information and communication technology (ICT) on development (World Bank, 2012; Kpodar and Andrianaivo, 2011; Cecchini et el., 2003). In recent years, with the explosive diffusion of mobile in the Global South, mobile devices are increasingly considered a more effective enabler of development (Kpodar et el., 2011). On top of the economic benefits of mobile proliferation in developing countries (Waverman et el., 2005), existing literature suggests two main characteristics of mobile devices in linkages with development. First, "mobility" grants the user of a mobile device ability to access services regardless of their locations while reducing the cost of communication and transportation (Sarker et el., 2003). It connects individuals to individuals and provides personalized channels of communication, knowledge and innovative services at their convenience beyond geographical barriers. Second, the inherent "flexibility" allows mobile devices to operate various types of applications (Beddall-Hill et el., 2011) and to be applied to enhance various industry sectors such as agriculture, manufacturing, logistics (Qiang et el., 2011) as well as labor market efficiency (Aker et el., 2010). Considering these two characteristics, it has been suggested that mobile devices make positive impacts on development by increasing information access points and expanding the scope of service applications and fields.

2.2 Financial Inclusion and Development

The term "financial inclusion" has gained importance since the early 2000s, as research findings suggest financial exclusion increase the risk of poverty (Shiimi, 2010). In this paper, *financial inclusion* is defined as *a delivery of useful and affordable financial services at affordable costs to disadvantaged and low-income people in a sustainable way* (World Bank, 2017; Muzigiti and Schmidt, 2013).

Financial inclusion could positively affect economic development at the household, firm and national levels. Increased financial access through effective financial inclusion programmes can facilitate a greater level of investment by household to improve their assets associated with productivity, which can increase household income in the future (DFID, 2004). In addition, improved financial inclusion or, more specifically, increased access to credit may affect economic growth by facilitating the entry of new firms (Klapper et el., 2004) who would otherwise be constrained by their lack of inherited wealth and the limited network with well-off incumbents. At the national level, inclusive financial system makes available more resources for investment, especially for the promotion of small and medium enterprises (SMEs). It can also create employment opportunities, ensure economic and financial stability by reducing vulnerability, and contribute to poverty reduction (Morduch et el., 2002).

Nevertheless, such benefits of financial access are only limited to the developed world as most developing countries experience the deficiency of access to financial services. According to the World Bank (2012), the provision of financial accounts differs enormously between the high-income and developing economies. The poor living in the rural areas of developing countries tend to have less access to financial services due to the lack of infrastructure and poor economic conditions (SantaMaria, 2016).

2.3 Mobile and Financial Inclusion

Mobile financial services (MFS) usually indicate the use of a mobile phone to access financial services and, in recently years, they have been recognized as an innovative and effective means to achieve financial inclusion. Previous literature identifies the typology of MFS and the different ecosystems within which it operates. Indeed, MFS encompasses various financial services such as mobile banking, mobile payment, mobile money transfer, and mobile international remittance services. Mobile banking is a service that provides customers with a channel to interact with a bank via a mobile device (Barnes et el., 2003). People primarily use the service to access their bank account balance and pay bills (Ernst & Young, 2009). Mobile payment, on the other hand, involves the use of a mobile device to make payments for goods or services either at the point of sale or remotely (KPMG, 2011) and it is increasingly being used in developed countries. Mobile money transfer, as in the case of m-Pesa in Kenya, is also popular in developing countries where users have low access to bank accounts but have high demand of

sending and receiving money between people. Money remittance refers to an international money transfer often used by migrant workers who send money to home country. There is a potential that money remittance services may shift from traditional providers to wireless carriers who are able to compete for the consumer market share on the basis of technological ubiquity and lower cost services (Merritt, 2011).
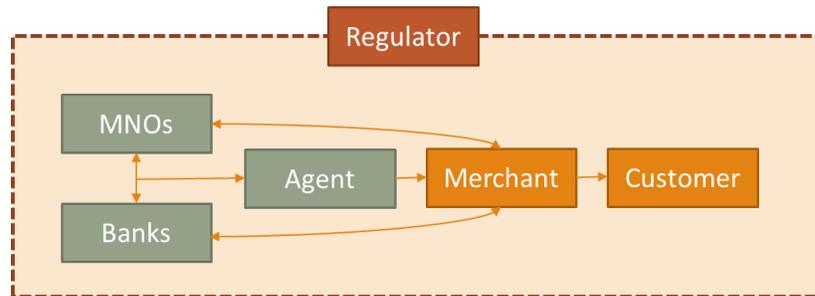

Figure 1. Ecosystem of mobile financial services

In the ecosystem of MFS (Figure 1), there are six main actors in delivering the services. Customers, at the center of this system, performs transactions with their mobile devices running an application provided by mobile financial networks (Dibia, 2014). Mobile network operators play a critical role to provide mobile financial services (Ramos et el., 2016). Banks usually serve as important actors who convert virtual mobile money currency into physical money and deposit balance of customers' mobile money by providing trust accounts to customers. Merchants need to pay certain amounts of fees to banks because they are entities or institutions which are frequent recipients of fund transfers, receiving payments from a consumer to a business firm at the point of sale. Agents are an interesting stakeholder unique in the context of mobile financial services, who work as over-the-counter service points providing savings and withdrawals for customers (Davidson, 2011). Last but not least, regulators have the greatest impact on the mobile money ecosystem (Varshney, 2014). They develop both guidelines and policies that cover the areas of creation of value, innovation and efficiency, and also take the role of supervising the enforcement of compliance.

In sum, current literature on MFS tends to focus more on the technology- and business-oriented aspects. While such studies can help us understand the current status of MFS in practice, our knowledge is still limited in terms of the key factors affecting the interplay of mobile, financial inclusion and socioeconomic development. To fill this gap, we critically review the existing

research at the intersection of mobile, financial inclusion and development and identify the missing analytical links connecting the three concepts, and draw out implications.

III. RESEARCH METHODS AND RESULTS

3.1. A Systematic Review

This study adopts a systematic review, a type of literature review method aimed at providing a complete and exhaustive summary of current literature regarding the research question by collecting relevant articles from databases. We combine the three-stage procedure of Tranfield, Denyer, and Smart (2003) and the guide of Siddaway (2014) to conduct the review in the following sequence: 1) preparation: scoping, planning, 2) execution: searching, screening, eligibility, and synthesis, and 3) reporting: result.

In the preparation stage, we identified three key concepts, "*mobile financial services", "financial inclusion"* and *"development,"* and created search terms for the three concepts to extract relevant papers. For 'mobile financial services,' alternative search terms include various financial services enabled by a mobile device such as: 'mobile money', 'mobile payment', 'mobile transaction', 'mobile wallet', and 'mobile banking'. In order to include alternative terms of 'mobile financial services', we used the search term 'mobile*,' which can include all types of mobile financial services. For 'development', both 'developing countries' and 'development' were included. Therefore, we also used the search term 'develop*' in order to include 'development' and 'developing countries'. Lastly, the term of 'financial inclusion' is exchangeably used with terms such as: 'access to finance', 'financial access' and 'increased financial services.' So we used above four terms including 'financial inclusion'.

Next, we identified the following exclusion criteria: articles not written in English, not published in a peer-reviewed journal, the terms "financial inclusion" or "mobile money" are not treated as a major theme or just treated as a marginal topic, and not geographically covering "developing countries" or mid- or low-income countries in Asia, Africa, Middle East or Latin America.

In the execution stage, article search was conducted using two major electronic databases:Web of Science and Scopus. The search used the following four combinations of search keywords:

(1) "mobile*" and "financial inclusion" and "develop*",

(2) "mobile*" and "financial access" and "develop*",

(3) "mobile*" and "access to finance" and "develop*"

(4) "mobile*" and "financial service*" and "develop*"

The search of Web of Science and Scopus resulted in 58 articles and 203 articles, respectively. Next, the duplicated articles and those did not meet exclusion criteria were eliminated. Then, we conducted abstract review so as to extract the articles focusing on all the themes of *'financial inclusion'. 'mobile money'* and *'development'*. As a result, the remaining 54 articles were selected for the full-text review (Figure 2).
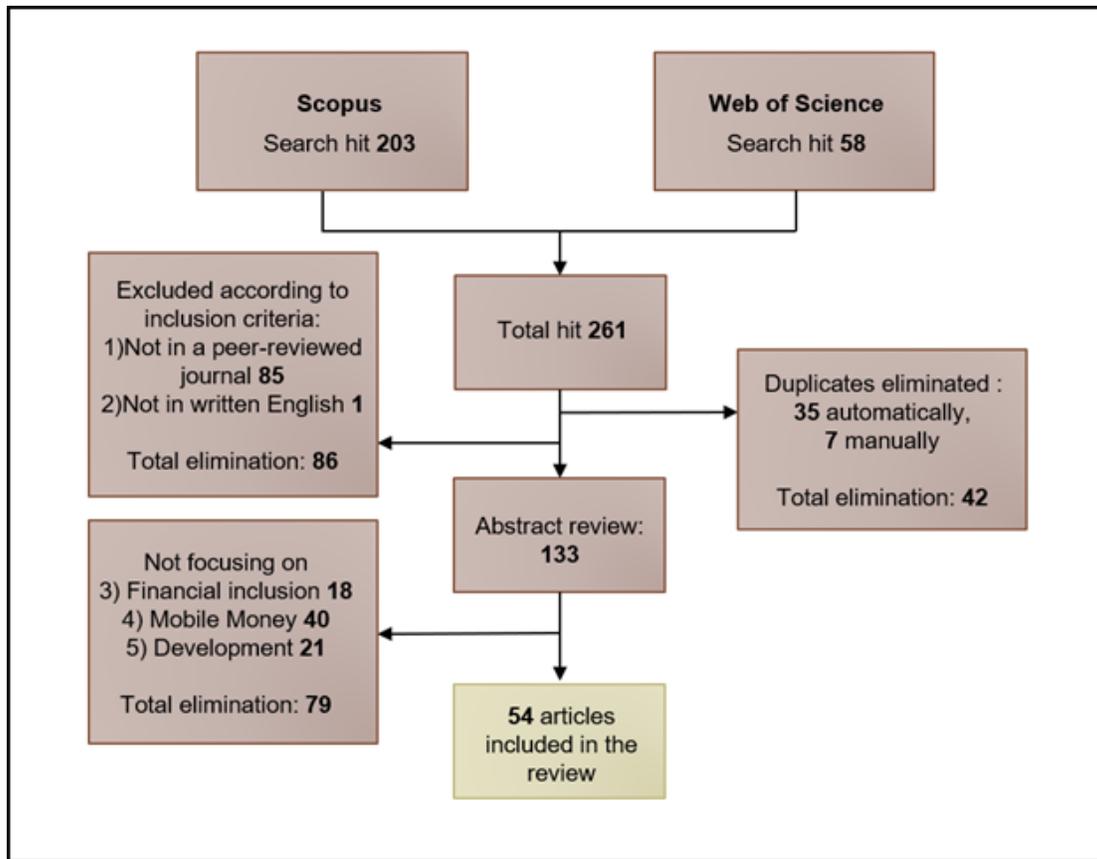
Figure 2. Procedure of systematic review

3.2 Results

Academic research pertaining to mobile, financial inclusion and development began to appear in journal publications since 2008 and the number has gradually increased (Figure 3). In terms of the regional focus (Figure 4), almost half of the articles (26) focus on the Africa region including Kenya, Ghana, Sudan, Zimbabwe, Jamaica, Uganda, and Nigeria. Among the 26, nine focus on the case of Kenya. The phenomenal growth of mobile financial services in Kenya with the success of M-Pesa (Mbogo, 2010; Mas et el., 2009) may have ignited the scholarly attention to the country.
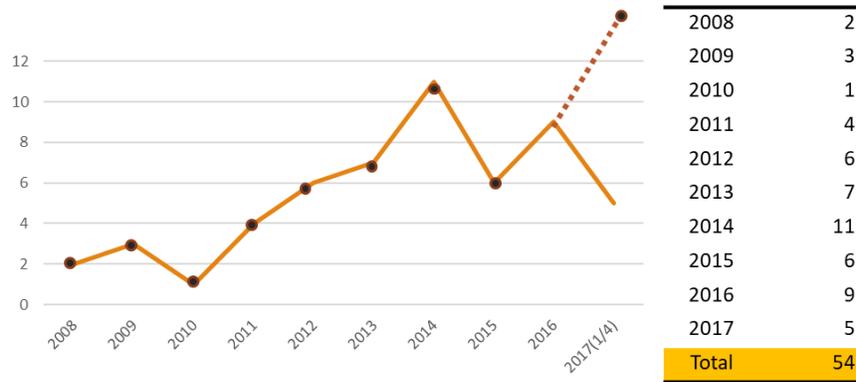
Year	Count
2008	2
2009	3
2010	1
2011	4
2012	6
2013	7
2014	11
2015	6
2016	9
2017	5
Total	54

Figure 3. The number of articles by year of publication

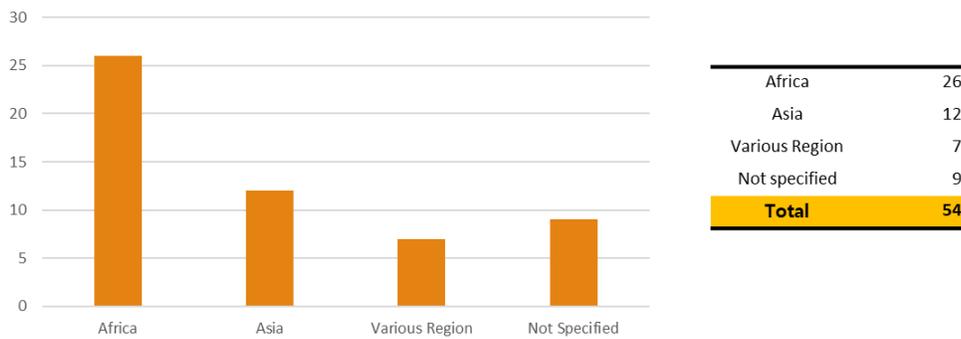| Region	Count
Africa	26
Asia	12
Various Region	7
Not specified	9
Total	54

Figure 4. The number of articles by region

Regarding the research methods (Figure 5), 30 percent of articles (16) use quantitative methods, while approximately 70 percent of articles (32) use qualitative methods. Among the qualitative studies, document analyses and descriptive case studies were the most common. The articles using quantitative methods mostly present descriptive statistics or adopt a basic regression model.
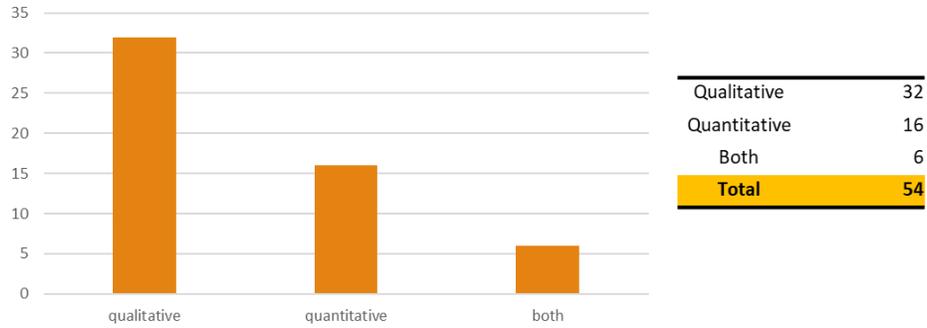
Qualitative	32
Quantitative	16
Both	6
Total	**54**

Figure 5. The number of articles by method

When it comes to data sources (Figure 6), the selected articles utilize secondary data twice as much as primary data. Methods of primary data collection vary, including in-depth interviews, focus group interviews and surveys. Other articles based on secondary data acquire the data from diverse types of sources such as Financial Access Survey (FAS), GSMA's Mobile Money programme[1], Consultative Group to Assist the Poor (CGAP)[2], and so forth.

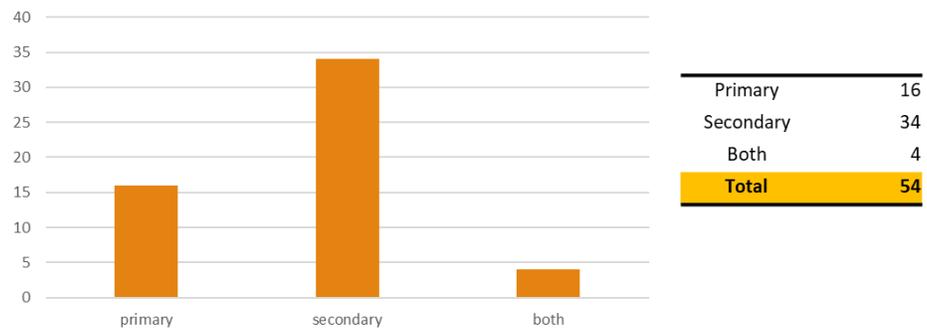|	
Primary	16
Secondary	34
Both	4
Total	**54**

Figure 6. The number of articles by data source

IV. FINDINGS

In this section, this paper classifies the literature by the research themes discussed in the selected articles and then examines key issues related to each of the themes.

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[1] https://www.gsma.com/aboutus/
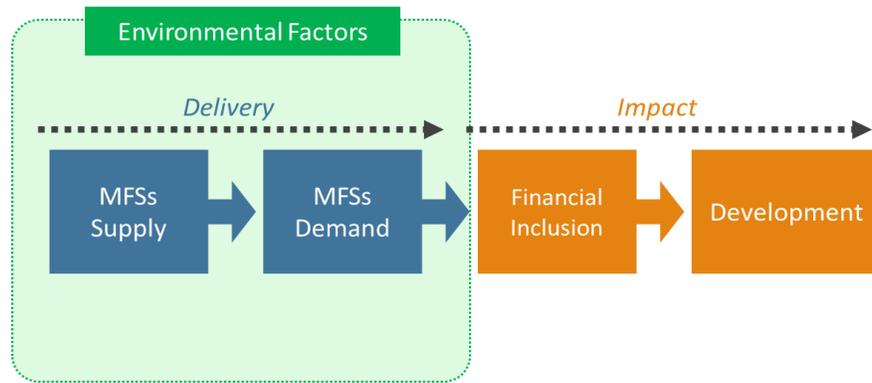
[2] http://www.cgap.org/about

Figure 7. The process of delivering mobile financial services to impacts

We categorize the articles according to the process of how MFS is delivered and in turn contributes to development. This process is usually examined in three dimensions: delivery, environmental factors, and impact (Table 1). The first stage is the delivery of MFS, which consists of dual aspects of supply and demand. When delivering MFS, environmental factors significantly influence both supply and demand sides. The last stage addresses the impact of MFS to development. Such a classification helps us identify recurring themes and major points of arguments that emerge from the actual process of MFS.

Table 1. Classification of the selected articles by subjects

Dimension	Subject	Article
Delivery	Supply	Batchelor (2012), Chaix et el. (2015), Christen et el. (2009), Gómez et el. (2014), Karrar et el. (2015), Santoso et el. (2016), Sanz et el. (2013)
	Demand	Behl et el. (2016), Bhuvana et el. (2017), Deb et el. (2017), Dzogbenuku (2013), Jones et el. (2014), Mago et el. (2014), Mishra et el. (2013), Mwangi et el. (2015), Osakwe et el. (2016), Peruta (2017), Shrivastava (2010), Wamuyu (2014)
	Supply & Demand	Fang et el. (2014), Parvin (2013), Van Der Boor et el. (2014)
Environmental Factor	Environmental Factor & Supply	Anong et el. (2013), Cousins et el. (2014), Maurer (2013), Minto-Coy et el. (2016)
	Environmental Factor & Demand	Alafeef et el. (2012), Ammar et el. (2016), Munyegera et el. (2016)
	Environmental Factor & Supply & Demand	anonymous (2008), Berger et el. (2013), Kadušić et el. (2011), Nyandoro et el. (2015), Sujata et el. (2017)
	Environmental Factor	Anderson (2009), Heyer et el. (2011), Johnson (2016), Johnson et el. (2012), Makulilo (2015), Potnis (2014), Ramos et el. (2016), Vlcek (2011)
Impact	Financial Inclusion	Asongu et el. (2017), Hinson (2011), Maurer (2012)
	Development	Allen et al. (2014), Donovan (2012), Evans et el. (2014), Ghosh (2016), Kikulwe et el. (2014), Vong et el. (2012)
Review	Literature Review	Donner et el. (2008), Duncombe et el. (2009), Shaikh et el. (2015)

Based on the classification of three dimensions, we draw out eleven notable sub-topics which were discussed commonly in multiple articles (Figure 8). In the 'delivery' cluster, three themes including agent networks, interoperability and intentions emerged as important issues on the side of supply, whereas two issues, perceptions and usage patterns, were considered as significant factors on the demand side. Also, in the 'environmental' cluster, the issues of regulation, socio-cultural factors, and demographics were raised. Regarding the cluster of "impact", we explored the issue of impact of financial inclusion and development. This exercise contributes to understanding the academic landscape of key issues surrounding mobile, financial inclusion, and development as well as providing key factors to be considered in each of the implementation stage of MFS in practice. Below, we discuss these eleven sub-topics in turn.
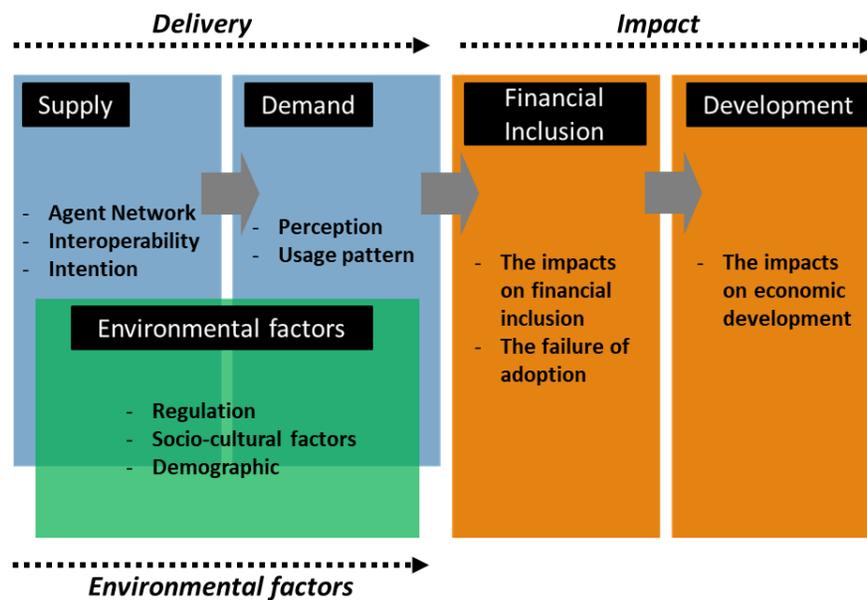
Figure 8. The issues on the existing articles relevant to mobile, financial inclusion, and development

4.1 Issues on Delivery

When delivering the mobile financial services from the service providers (e.g. mobile carriers or banks) to users, there are various issues surrounding the delivery process. On the upply side, the articles heavily focus on *agent networks*, *interoperability*, and *intentions*. On the demand side, *perceptions* and *usage patterns* were the two major topics into which the selected articles delved.

Supply: Agent networks

Agent networks are a distinctive feature of mobile financial services, which generally contribute to sustaining the ecosystem of mobile financial services. The agents are the actors operating in the field, who perform a crucial function of administrating customers to deposit cash into an electronic money transfer system and withdraw cash out of it (Maurer et al., 2013). Therefore, the agent network is regarded as a type of 'infrastructure' in mobile financial services. Agent networks can supplement the problem of limited access to financial services observed in most developing countries (Sanz et el., 2013). In order to overcome a geographical barrier, some MFS suppliers have built a broad agent network composed of different types of agents, such as small shops, bank branches, and bill-payment counters. Moreover, agents can attract new clients by promoting mobile financial services face-to-face as advertising campaigns. For that reason, it is important for suppliers to hire trustworthy agents and maintain a good relationship with them (Maurer et al., 2013; Sanz et el., 2013).

Yet, the literature also pointed out the difficulties in operating the agent network. First of all, suppliers and regulators have some difficulty in dealing with *liquidity management* (Cousins et el., 2014; Maurer et al., 2013). Agents are sometimes incapable of managing asset liquidity that enables them to do cash-in and cash-out to customers (Donovan, 2012; Duncombe et el., 2009), which may result in making current customers distrust the services. Also, there is a problem of human resources in operating agent networks. Some studies indicate that firms and banks in developing countries have difficulties in recruiting qualified employees and agents (Asongu et al., 2017; Maurer et al., 2013; Potnis, 2014). Because most of them lack necessary skills and competence required for handling MFS delivery, they cannot understand the operating process of the services and are unable to give appropriate information to their customers.

Supply: Interoperability

It is important for firms and banks to ensure interoperability beyond complex business circumstances of mobile financial industry (Maurer, 2012; Sanz et el., 2013). Interoperability of the service enables cross-platform transactions between customers, even though they have accounts with different service providers and technical platforms from various stakeholders such as mobile network operators, banks, networks and agents (Cousins et el., 2014). For instance, Cousins et el. (2014) points out the importance of standardization within the mobile financial

services as a prerequisite to interoperability (Cousins et el., 2014). However, interoperability has not been properly established within mobile financial industry in developing countries (Cousins et el., 2014). If interoperability is not well-established in the industry, there could be the risk of "monopolistic market" by a dominant player (Kadušić et al., 2011; Maurer, 2012; Anderson, 2009). A monopolistic industry could hamper the circumstance where firms can compete freely.

Supply: Intentions

Our findings suggest that suppliers' intention to provide mobile financial services is important in the service delivery. Minto-Coy et el. (2016) and Parvin (2013) argue that, in the context of developing countries, banks and mobile network operators generally have a positive view over offering mobile-based financial services. Most of the banks in developing countries are trying to adopt mobile banking to satisfy their customers and attract potential customers (Parvin, 2013). Moreover, one article shows that the strong initiative and entrepreneurship of banks and mobile network operators as service providers are closely related to the reasons why some countries have been able to successfully introduce the services (Minto-Coy & McNaughton, 2016) while others not.

Demand: Perceptions

The majority of articles under the demand cateogry emphasize heavily on the importance of customers' perception of the mobile finance services. First, *awareness* means whether a customer is aware of mobile financial services (Hinson, 2011), which can be a major determinant of adoption by microfinance customers (Ammar et el., 2016). It can also be a stepping stone to facilitate financial inclusion in developing countries (Ammar et el., 2016; Peruta, 2017).

Second, *perceived usefulness* relates to whether customers regard mobile financial services as relevant to their everyday activities (Osakwe et el., 2016). According to Mago and Chitokwindo (2014), the respondents with low economic status in Zimbabwe answered that they were willing to adopt mobile banking based on the perception that it seemed to be easily accessible, convenient, inexpensive, easy to use and secure.

Third, *perceived risks* are related to the inherent uncertainty of an innovation, which can be identified as a critical barrier to mobile financial services (Bhuvana et el., 2017; Dzogbenuku, 2013; Kadušić et al., 2011; Mishra et el., 2013; Osakwe et el., 2016). For instance, potential

customers would be concerned with personal information leakage during the use of mobile financial services (Kadušić et al., 2011), or they may have less trust on services of mobile network operators and their retailers than in traditional banks, which in turn may decrease their service uptake.

Demand: Usage Patterns

Another significant topic under the demand side of MFS delivery is the usage pattern, particularly relating to domestic money transfer or international remittance (Jones et al., 2014; Munyegera et el., 2016). In developing countries, remittances from the domestic urban areas or overseas constitute an important source of income for family members at home (Jones et al., 2014). To withdraw remittance, recipients usually need to have a bank account of formal banks. However, it is difficult to create new bank accounts for the low-income people as banks in developing countries often request a higher amount of deposit to open a bank account. In this situation, mobile financial services in developing countries can fill such needs effectively since they require much simpler and affordable registration process and offer faster and easier transactions compared to those from formal financial institutes. Munyegera et el. (2016) argue that the needs of remittance has promoted the use of mobile financial services in developing countries, which in turn increased the frequency and the total value of remittances received, compared to those received by households who do not use MFS (Munyegera et el., 2016).

However, the current usage of MFS is largely limited to simple money transactions. Less attention is paid to the adoption of mobile-based savings and loans accounts. Reflecting such a limited use in practice, few studies address customer's usage pattern regarding savings and loan in our selected research.

4.2 Issues on Environmental Factors

Regulation

The selected research articles suggest that regulations surrounding the emerging MFS industry is a double-edged sword. Maurer (2013) argues that one of the main reasons behind the failures in MFS adoption is the heavily regulated financial industry. Evans et el. (2014) and Sanz et el.

(2013) also analyze that there are too many restrictions on the MFS such as agent restrictions and compulsory regulations of accurate customer identification, leading to a rigid business environment. Under those conditions, companies that were initially willing to provide MFS are prohibited by a variety of strict financial regulations and may eventually lose motivation to launch or continue the services.

On the other hand, some studies contend that strict regulations need to be retained in order to mitigate potential risks and to protect security and stability of the financial system (Makulilo, 2015; Vlcek, 2011). Especially, appropriate regulations should be implemented to prohibit money laundering and financing of terrorism, and thereby to sustain the sound financial system (Anong et el., 2013; Cousins et el., 2014). Combined together, regulatory environment is in general a decisive factor which either facilitates or hinders the adoption of mobile financial services in developing countries (Evans et el., 2014).

Demographic Factors

Our findings show that demographic characteristics of potential consumers in developing countries tend to have negative impacts on the adoption of mobile financial services. To begin with, most of studies commonly argue that the 'lack of income' excludes people from financial services (Alafeef et al., 2012; Ammar et el., 2016). Unstable and unsecure employment is also closely related to the issue of income (Johnson et el., 2012) as well as the lower access to financial services. Literature in this group also argues that low-income populations do not feel the needs to use mobile financial services.

Second, limited education is a major obstacle to the diffusion of MFS in developing countries (Alafeef et al., 2012; Ammar et el., 2016; Dzogbenuku, 2013; Johnson et el., 2012). Not only illiteracy, but also 'financial illiteracy' is a critical hindrance to financial inclusion. In developing countries, people are usually excluded from the formal financial services while there is a lack of financial education programs which can inform people (Berger et el., 2013). Conversely, Hinso (2011) suggests a different view that mobile financial services would be a valuable opportunity for the poor because the mobile-based services are easier to use than the formal financial services provided by traditional financial institutions.

Third, regarding gender, findings from our selected literature is still far from conclusive. Some literature claims that gender discrimination leads to inequality in financial behaviors and it has critically prohibited women from using formal mobile financial services as well as formal financial services (Alafeef et al., 2012; Ammar et el., 2016; Johnson et el., 2012; Potnis, 2014). On the other hand, according to Johnson and Arnold (2012), mobile financial services give females increased access to finance than formal banking services because of the simpler registration process and less burdensome document requirements.

Socio-cultural Factors

Socio-cultural factors seem to have positive impacts on both supply and demand sides of the mobile financial industry. Concerning social contexts, Johnson (2016) and Maurer et el. (2013) find the positive impact of social network, which can increase the usage of mobile financial services due to network effects. Moreover, the effect of word-of-mouth could be multiplied especially in rural areas where people tend to have stronger relationships within a community. Moreover, the social relationship can improve the efficiency of distribution channels as agents' social relationships with customers help provide mobile financial services more easily based on trust (Berger et al., 2013; Maurer et al., 2013). Regarding cultural contexts, the articles assert that certain characteristics of local communities significantly influence the adoption of mobile financial services (Alafeef et al., 2012; Potnis, 2014). On the supply side, organizational values and culture affect the supplier's operational transparency and the ability to face market competition. The level of protection for consumers may also influence the adoption (Potnis, 2014). On the demand side, however, the effect of cultural contexts on the MFS adoption is still unclear and varies in different regions.

4.3 Issues on Impact

Impacts on Financial Inclusion

Some articles show that mobile financial services can increase pathways to financial inclusion for low-income population in developing countries (Hinson, 2011; Maurer, 2012). The services have helped to overcome infrastructural constraints and improve financial inclusion (Allen et al., 2014; Hinson, 2011; Maurer, 2012). Asongu et al. (2017) examine the usage of mobile devices in African countries and shows that mobile financial services have positive effects on financial

depth[3] and financial activity[4]. Yet, there is only one article that empirically examines the effect of mobile financial services on financial inclusion, which makes it difficult to firmly assert the effect of the services. That said, our findings show that there is a paucity of research addressing how and to what extent mobile financial services impact financial inclusion and how much the services have improved the level of financial inclusion.

Impacts on Development

In our selected research, the linkage between MFS and economic growth is discussed in relation with the increasing coverage of financial services (Andrianaivo et el., 2012). For instance, Ghosh (2016) empirically examines the impact of financial inclusion on economic development by analyzing the data from Middle East and North African countries. The study demonstrates that one percent increase in the portion of population using mobile device improves household incomes by roughly 0.3 per cent points. On the other hand, a similar one per cent increase in financial inclusion has doubled the impact on household income. Based on this analysis, it concludes that financial inclusion actually contributes to economic development in developing countries. Kikulwe et al. (2014) also empirically show that smallholder farmers who use mobile financial services in rural areas of Kenya tend to have higher profits than others who did not use the services.

The Failure of Adoption

Our analysis of the extant research finds that there is a general recognition of the positive link between mobile financial inclusion and development. Nevertheless, many attempts to adopt mobile financial services for financial inclusion in develoing countries have failed to achieve

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[3] According to World Bank, financial depth captures the size of the financial sector relative to the economy. It considers the size of banks, other financial institutions and financial markets in a country, taken together and compared to a measure of economic output.
Retrieved from http://www.worldbank.org/en/publication/gfdr/background/financial-depth

[4] Financial activity means any transactions or initiatives undertaken by a business to further the fulfillment of economic goals. Financial activities may include buying and selling of products or assets, organizing and maintaining accounts, issuing stocks or bonds, arranging loans, or other business activities with specific monetary objectives. Retrieved from http://www.businessdictionary.com/definition/financial-activities.html

expected outcomes, except for a handful of cases in Pakistan, Philippines and Kenya. Bisht and Mishra (2016) shed light on this regard. Out of the 22 countries trying to implement mobile financial services, only eight countries managed to create successful mobile financial services that have actually rooted and grown rapidly; three countries showed a slow and limited growth and, in the remaining eight countries, MFS initiatives largely failed to hold.

V. DISCUSSIONS

5.1 Research Landscape

Heeks (2010)' argument of the changing focus of ICT priorities over time explains that, as time goes by, the priority of ICT in development also changes from readiness to impact. Comparably, drawing from the result of the systematic review, we find a similar pattern of shifting foci at the nexus of mobile, financial inclusion and development. That is, as the level of MFS initiatives gradually increases, academic attention also moves from the topics of readiness to impact.

Figure 9 illustrates the allocation of the selected articles according to Heeks (2010). As discussed, the number of articles examining each domain of *availability*, *uptake* and *impacts* is not as high as that of articles discussing *readiness*. Additionally, there are less articles on supply-side issues compared to those on demand-side issues. Further, not many articles are included in the domain of *uptake* because the existing articles have focused more on the potential adoption of the services rather than actual usage of the services. The articles included in the domain of *impact* are also fewer compared to those under the *readiness* category. Moreover, the articles in the domain of *impact* do not usually demonstrate or discuss real impacts of mobile financial services on development. Insetad, they tend to propose possible or potential impacts. For instance, only six articles presented empirical evidence that mobile financial services have positively impacted financial inclusion and development, while the rest describes the possible impact that could potentially be prompted by the services.
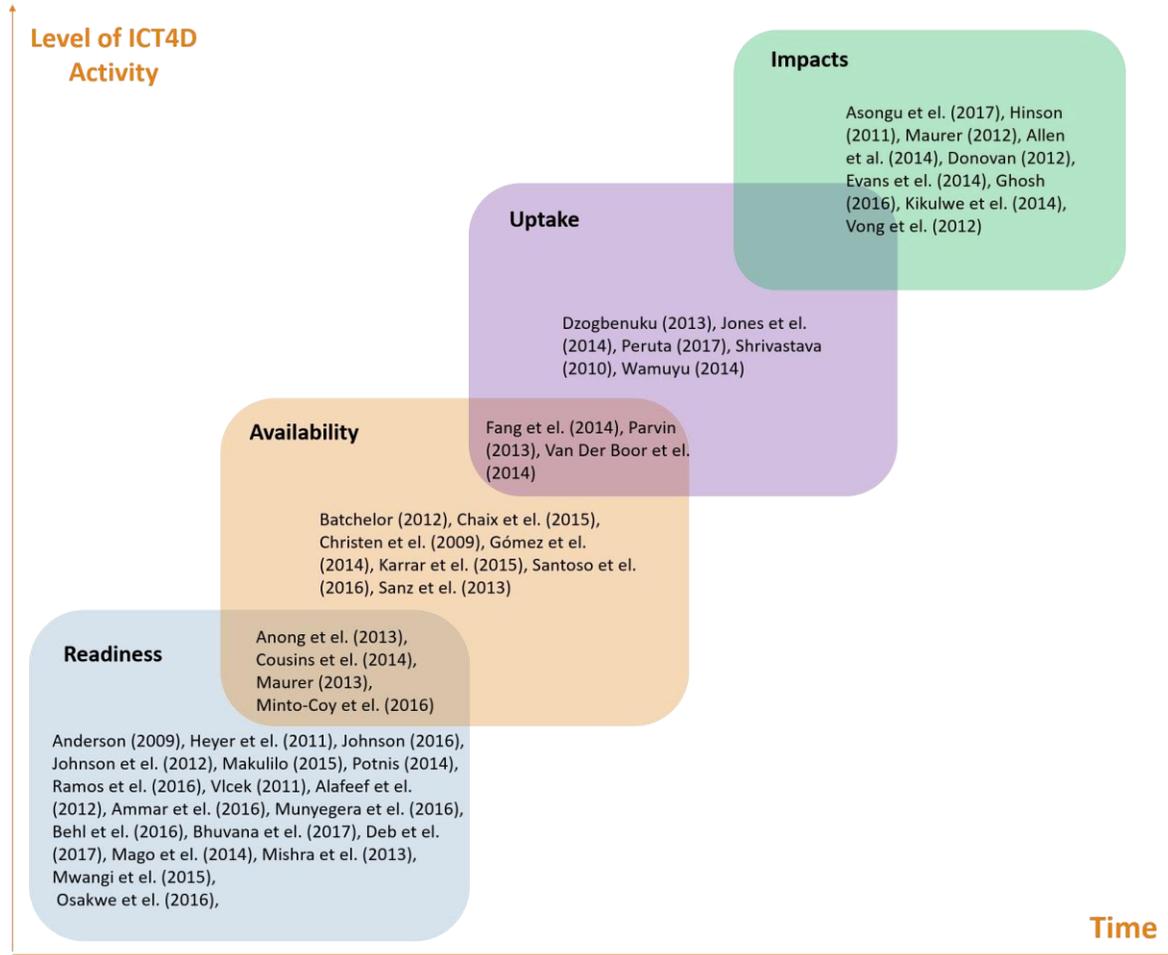
Level of ICT4D Activity

Impacts

Asongu et el. (2017), Hinson (2011), Maurer (2012), Allen et al. (2014), Donovan (2012), Evans et el. (2014), Ghosh (2016), Kikulwe et el. (2014), Vong et el. (2012)

Uptake

Dzogbenuku (2013), Jones et el. (2014), Peruta (2017), Shrivastava (2010), Wamuyu (2014)

Availability

Fang et el. (2014), Parvin (2013), Van Der Boor et el. (2014)

Batchelor (2012), Chaix et el. (2015), Christen et el. (2009), Gómez et el. (2014), Karrar et el. (2015), Santoso et el. (2016), Sanz et el. (2013)

Readiness

Anong et el. (2013), Cousins et el. (2014), Maurer (2013), Minto-Coy et el. (2016)

Anderson (2009), Heyer et el. (2011), Johnson (2016), Johnson et el. (2012), Makulilo (2015), Potnis (2014), Ramos et el. (2016), Vlcek (2011), Alafeef et el. (2012), Ammar et el. (2016), Munyegera et el. (2016), Behl et el. (2016), Bhuvana et el. (2017), Deb et el. (2017), Mago et el. (2014), Mishra et el. (2013), Mwangi et el. (2015), Osakwe et el. (2016),

Time

Figure 9. The allocation of selected articles Adapted from Heeks (2010)

In sum, reflecting the result that existing articles mostly concern the stage of *readiness*, we argue that the research on this topic of mobile, financial inclusion and development still remains at an early stage.

5.2 Usage of Methods by Subjects

At a glance, the articles dealing with the subject of the supply and demand of the MFS delievry use diverse methods across both qualitative and quantitative analyses. However, some tendencies are observed. The articles examining the supply-side issues only use qualitative methods with only one exception (i.e. Chaix et el., 2015). Most of them are based on the discourse analysis using text contents collected from other sources. On the contrary, the articles on demand-side

issues adopt mainly quantitative methods, often based on the primary data collected from the potential and current customers. Although statistically valid results from quantitative studies can be supplemented by qualitative analyses to be more credible, the demand-side articles tend not to explain the statistical results sufficiently or contextualize their interpretation in the given research conditions. That said, the choice of research methods in the extant research shows a limited variety and depth. The subject of articles with less empirical evidence are required to be studied quantitatively so as to increase the credibility. On the other hand, the articles with less in-depth and contextual examination also need to be researched for giving more reasonable explanation of the social phenomena.

VI. CONCLUSION

Amid the increasing importance of mobile-based financial inclusion initiatives in practice, this study analyzes existing academic papers *vis-à-vis* the three themes of mobile, financial inclusion and development to understand the current research landscape and possible gaps. Using the systematic literature review, we classify the articles into three main clusters including delivery, environmental factors and impact, and then analyze the key issues drawn from the existing articles. Our analysis shows that current research on the theme of mobile, financial inclusion and development is still at the nascent stage, so there is enough room and topics for future study. We also find that the articles on the supply of MFS tend to use qualitative methods while the demand-side research are heavily based on quantitative methods. Such a biased use of methods should be balanced out and more mixed-methods or innovative methods should be encouraged to deepen our understanding of the topic in the future.

This study is limited by the scope of articles we analyzed; which are mainly the peer-reviewed academic papers written in English. While such a choice to leave out policy-oriented reports and grey literature published by active organizations in the MFS field (e.g. World Bank, IMF, and CGAP, GSMA, etc.) was intentional to meet our research goal of understanding the academic landscape, our result is also limited by this boundary of academia.

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