Technology and Entrepreneurship Center at Harvard

Innovations to Facilitate Increasing Participation by Underbanked Individuals in the Digital Economy

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Among underbanked individuals, there are financial decision-makers whose increased inclusion will benefit themselves and the wider community.

INTRODUCTION

Underbanked individuals have access to some limited financial resources, such as a bank account or a debit card. But, they do not participate more fully in financial markets, both their structures and institutions and the array of financial offerings. They may be more reliant on cash, which suffers from serious limitations, such as irretrievable loss. Moreover, financial activities increasingly take place in digital form. Since urbanization is a significant global trend, the emphasis will be on underbanked individuals in urban environments.

What are scalable solutions to the persistent problem of insufficient access to the increasingly digital financial system? The perspective will be to look through the eyes of the underbanked individual rather than from the viewpoint of the financial service provider. The shift in optic may reveal new approaches.

What existing financial services can be offered more effectively to meet the needs of underbanked individuals? What are the challenges? Are there pain or pressure points that have not been sufficiently identified or addressed? What are the roles of informal financial arrangements, which bypass traditional financial markets? They can be rich sources of networks, systems, and information. How can they be better identified and made explicit so that useful lessons from them can be adapted and applied?

The information transformation undergirds digital financial activities. Aspects of the information evolution may provide insights about including more underbanked individuals in the digital financial system. This Ubiquitous Information Environment (UIE) is defined by five characteristics: ubiquity, embeddedness, decentralization, unboundedness, and complexity. Other hallmarks of the information era are the decoupling of formerly fixed relationships and disintermediation. There are elements of the economics of information that differ from other goods and services, for example, inexhaustibility, network effects, and leapfrog capacity. Each of these qualities will be described and examined.

The paper applies information principles to facilitate innovation and inclusion for underbanked individuals. The goals are to make problems and potential solutions more transparent, to reduce friction in systems, and, thereby, to identify unexplored or underexplored opportunities and to open up possibilities for innovation and inclusion for underbanked individuals.

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UNDERBANKED INDIVIDUALS

Underbanked individuals are those who participate in the traditional financial markets but in a relatively limited manner. For example, they may have a bank account or a prepaid or debit card, but they may not have or have access to savings accounts, credit cards, and other financial vehicles. Interestingly, a substantial percentage of individuals with an account do not use it.

Underbanked individuals are found in developing and developed nations. It is by no means only a developing country phenomenon. For example, the Board of Governors of the Federal Reserve System in the United States reported in 2018 that 16% of US adults were underbanked.

Underbanked individuals are distinguished from unbanked individuals, who, as the name implies, do not have ongoing relationships with banks or most financial products. While underbanked and unbanked individuals are located everywhere, they form part of the strong trend toward urban environments. The focus, therefore, will be on urban populations. The wave of migration toward cities raises the challenges of providing adequate infrastructure, including financial systems, to serve these growing populations.

Moreover, underbanked individuals are not a monolith. They consist of varied populations with different needs, opportunities, and challenges, forming a heterogeneous mix of individuals throughout the world.

FINANCIAL PARTICIPATION IN DIGITAL FINANCIAL SYSTEMS

Unlike unbanked individuals, underbanked individuals have a foot on the ladder of the digital financial system, which they can ascend toward greater financial stability and independence. The goal is to facilitate financial participation by getting more people on the first rungs, which provides the base for climbing the ladder. It can be hard to develop a credit history without a payment history and, difficult to get a loan without a credit history. Underbanked individuals face persistent problems of insufficient access to financial systems, which are increasingly digital. Increased engagement with financial systems would enable the individual to engage more fully in the economy, supporting better outcomes.

There are four general categories of financial services: digital payments, credit, loans, and capital. This paper will focus on digital payments rather than credit, loans, and capital, which may be higher up the financial ladder.

Several factors influence participation in digital payments. They include cash, informal financial systems, trust, and interaction with dominant technology companies.

Cash fuels much of the world's transactions. It has advantages. There is a low threshold to participate in the economy. It is an anonymous payment system. But, there are disadvantages, too. It is accessible to anyone who can lay hands on it. If lost, the value cannot be retrieved. It is costly to produce, protect, and move around.

While cash still dominates, the transition from cash proceeds. This trend has engendered an equity argument that the ability to use cash must be retained for those who do not have access to digital payment systems. The case for cash has been reinforced by initiatives to enact and enforce laws that require merchants to accept cash payments. Massachusetts already had a statute requiring retail establishments to accept cash as payment. New York City, Philadelphia, and New Jersey recently adopted such requirements. The challenge: how to lower the threshold to use digital financial services to or near the threshold of cash?

In lieu of participation in traditional financial systems, underbanked individuals may use informal financial systems, including nontraditional financial institutions and non-bank financial institutions. These informal systems can be rich sources of networks and information. However, how can they be better identified and made explicit? What are their roles? What gaps do they fill? What are the impediments to accessing traditional systems (which traditional institutions might address, thereby moving more activity from the informal sector into the mainstream economy)?

One method is to identify and chart these rich, informal pathways. The mapping of the bus routes in Nairobi, Kenya, provides an illustration. There was no official, published route. Everyone who took a particular bus knew the route and the times of the buses. But, if they wanted to go to a different part of the city to look for or take up a new job or attend a different educational institution, it was not easy to find the correct bus and time. So researchers

created a map of routes and times, then published it on the internet. It democratized the information, made it more accessible and transparent, reduced friction, and revealed new possibilities.

Trust is a framework condition for increasing digital payments by underbanked individuals. It is eminent that a digital payment system and provider must offer certainty, predictability, and uniformity in services and infrastructure for digital transactions. There should be clear processes for the digital payment system. They should remain dependable and consistent over time, rather than undergoing frequent amendments or updates, which require new learning. Further, greater uniformity of systems for various applications serves as another incentive for adoption. Critically, underbanked individuals must experience enough stability in their lives and surroundings to have confidence and certainty in the present and trust in the future that there will be sufficient security and enough of a safety net to shield them from harsh or draconian external effects. Simplicity and transparency are conditions precedent and inducements to the uptake of digital payments. Finally, digital payment systems must avoid even a whiff of exploitation or unfair dealing.

The growth of e-commerce and online shopping has accelerated during the global pandemic. The dominant technology companies, such as Amazon, Google, and Facebook, play a leading role. "[M]ore than 60 percent of the time, consumers searching for a product online start at Amazon.com. Google captured 73 percent of all search advertising dollars in 2019. Facebook, in addition to providing crucial access to its social network data, has become an essential spot for any digital storefront." Therefore, for many, their initial and continuing online shopping experiences take place via Amazon, Facebook, or Instagram, and use of Google search. Since the large tech players are the prevailing conduit to purchasing goods and services online and cash is not a viable payment system, it would be useful to understand better the activities of underbanked individuals on these platforms, including as compared with the banked population, and to look for opportunities to facilitate participation by underbanked individuals through digital payments. How best to bridge the differences, and what are the opportunities and challenges in doing so? These questions merit more study and could further democratize economic participation.

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ASPECTS OF THE UBIQUITOUS INFORMATION ENVIRONMENT

Digital payments are made possible, enabled, and facilitated by the information evolution that creates the technological landscape of the Ubiquitous Information Environment (UIE). The aspects of the UIE includes four features, five characteristics, decoupling of formerly fixed relationships and disintermediation, and economics of information.

The four features are well known: common decentralized architecture, such as the Internet Protocol, information processing, network bandwidth, and digitization. There has been exponential growth in information processing, concomitant declines in cost, and increased storage, with related decreases in cost. These developments permit the collection and use of large amounts of data.

There are five characteristics of the UIE, which are transformative phenomena: ubiquity, embeddedness, decentralization, unboundedness, and complexity. Information, computing, and communication have proliferated, are already pervasive, and will continue to become ever more widespread. It is estimated that, when Internet Protocol version 6 (IPv6), in preparation since the 1990s, is fully implemented, it will provide enough address space to assign a unique IP address to approximately every 40,000 molecules on earth up to a kilometer off the face of the planet. Traditionally, new products and services are introduced in urban centers and spread toward rural and remote areas. Instead, conceive of a world without edges, technically possible, creating a Mobius strip of information and communication access. Information and communications technologies are embedded throughout our environment and within our bodies, which will continue to intensify. While the traditional models of hub and spoke and centralized or hierarchical structures persist, decentralization is a hallmark of our era, represented by the Internet Protocol itself and peer-to-peer arrangements, such as blockchain. The unboundedness is exemplified through the ramifying addition of nodes and connections. Already, complex systems exist, which are used but not fully transparent. Elements of the cloud are a familiar example. Another is some artificial intelligence software referred to as "black boxes." The outputs are discernable, but humans do not have visibility into the process for producing them. Indeed, the obstacles of

the UIE are not really technological difficulties. Instead, they are challenges of complexity. Complexity theory related to information is still insufficiently articulated. That deficit means that complexity management also is inadequately understood and defined. Complexity, as it relates to the UIE, is another interesting area for future study.

These phenomena enable the decoupling of formerly fixed relationships, which unlocks opportunities for new activities. The Internet Protocol itself, one of the most fundamental elements of the UIE, illustrates the point. It opened up the information and communication landscape to millions of new stakeholders, products, and services. Another good example is public key cryptography, also known as asymmetric cryptography, which was developed in the 1970s. Secret communication existed throughout human history, using private key cryptography, also called symmetric cryptography. The parties to the secret communication had a key for encrypting and decrypting. But, one limitation was the need at some point to exchange the key. Public key cryptography eliminated that requirement. It consists of both a private key and a public key. Anyone can access the public key and use it to encrypt a message, which the recipient can only decrypt with the private key. This development multiplied the ability to send encrypted messages because a key exchange was not required and reduced vulnerabilities, such as the need to exchange the private key. While decoupling creates space for new entrants, disintermediation flattens previous structures by obviating steps or participants from a chain of activity. Those intermediate steps are no longer needed, allowing for new entrants and possible efficiencies.

There are five characteristics of the UIE, which are transformative phenomena: ubiquity, embeddedness, decentralization, unboundedness, and complexity.

There are elements of the economics of information that differ from other goods and services, including inexhaustibility, network effects, and leapfrog capacity. Generally, goods and services are used up, exhausted by someone's use. If Jane eats her sandwich, Sally cannot have it. Bob cannot have Jim's haircut. Information can exhibit different properties. If someone accesses certain information, another can, too. Use generally does not decrease the value of the information to others. Indeed, the use by more than one individual and by more and more individuals may increase the value of the information. The term network effects stands for the notion that the value of the network to its members increases with the addition of participants. The more connections that are made, increasing the network, the more valuable and potentially influential the network becomes.

In the field of innovation, technology trends and trajectories are well-developed areas. For example, the steps to build a steel industry are well known, as the Republic of Korea did after the Korean War. Traditionally, the entrant followed the stages of the trajectory. However, one of the exciting aspects of information technology is that it is not necessary to traverse a set path of increasing development and expertise. Rather, a country can leapfrog, as it is termed, and enter at a technological development level higher up the trajectory. If possible, this procedure is more efficient because it is unnecessary to re-create the trajectory, which takes time, and the nation or company can become competitive more quickly at less cost. As a result, technology uptake and diffusion can occur at a higher level. By this point, there are plenty of examples, one of the most prominent being the deployment of mobile telephony in Africa. As a result, the traditional communication requirements and expense of putting backhoes in the ground and laying lines were obviated, and many millions gained access to communications and information. Indeed, access to mobile telephony is more common than the availability of electricity in sub-Saharan Africa. Notably, payments are among the top activities on mobile devices in that region.

INCREASING OPPORTUNITIES FOR UNDERBANKED INDIVIDUALS TO PARTICIPATE IN DIGITAL FINANCIAL SYSTEMS

The pool of individuals seeking financial services has grown beyond male elites to various newer entrants, including women in much larger numbers, the aspiring and growing middle class in the Asia-Pacific region, and surges of global immigration and migration. There is, therefore, a lot of fertile terrain to explore moving underbanked individuals into more mainstream financial institutions and services. So what are the policies, programs, or other levers that can help underbanked individuals gain more access to the digital financial system to benefit themselves, the economy, and society?

It has been estimated that women make approximately 85% of purchasing decisions for the household across the world.

Underbanked individuals constitute a diverse population. The term underbanked itself is broad. In terms of increasing participation in digital financial systems, it is beneficial to identify, within this wide category, the activities, and stakeholders that are likely both to make a systemic difference and are amenable to change. Therefore, the focus should be placed on financial decision-makers, those actors within the underbanked population where trends show increasing participation, the potential for more leverage and return, and influence on others in their networks. Women, the middle class in the Asia-Pacific region, and migrants constitute three important groups.

Women, half the population, play the decisive role in purchases throughout the world, either buying goods and services themselves or influencing decisions about them. Indeed, it has been estimated that women make approximately 85% of purchasing decisions for the household across the world. A 2009 Harvard Business Review article noted, "As a market, women represent an opportunity bigger than China and India combined. They control $20 trillion in consumer spending, and that figure could reach $28 trillion in the next five years. Women drive the world economy." Providing greater access to digital payments could benefit them, their families, and others within their spheres of influence.

Despite their dominance in consumption and in addition to facilitating access to digital payment systems, there is still more room to increase women's ability to participate in the economy. Women disproportionately carry the burdens of household maintenance and childcare. These chores are more inefficient than they need to be in many places due to basic infrastructure barriers, such as lack of access to electricity or water or time spent obtaining water for the family for drinking, cooking, hygiene, and laundry. Daily, women around the world spend approximately 200 million hours fetching water. UNICEF dubbed it "a colossal waste of time," while the UNICEF global head of water, sanitation, and hygiene (WASH) observed, "200 million hours is 8.3 million days or over 22,800 years… Think how much women could have achieved in that time." "In sub-Saharan Africa, one roundtrip to collect water is 33 minutes on average in rural areas and 25 minutes in urban areas. In Asia, the numbers are 21 minutes and 19 minutes respectively." Access to electricity is also an issue. Improvements in these areas would free up women's time, including making time for enhanced economic participation.

Digital payments offer opportunities for women to gain and retain agency related to their money and protect them from unwanted pressures from husbands, mothers-in-law, and domestic violence. While a husband or mother-in-law may demand the weekly wages in cash that a woman brings home, digital payments are not immediately accessible to third parties in the same way. As a result, the funds are more secure, and the woman may have the opportunity for more autonomy and control. Is it possible to use digital payments to create speed bumps against unwanted influence? The analogy of voting may be helpful. No matter the prior pressure, when the individual enters the voting booth, she is alone and shielded from external coercion. Compare that common voting scenario with a woman sitting at the kitchen table marking the ballot at home, with another observing. How do we assure a zone of autonomy for financial transactions? What if, for example, the digital payment card or device never came home? What if an individual must enter alone to see balances, make payments, access or transfer money, or set it aside? Opening these types of small spaces, in the move from cash to digital payments, may permit a woman to plan and to allocate funds more directly to her family's needs.

In developed countries, there are often deals to reduce or eliminate fees or receive "cashback" or similar bonuses. What current digital payment services could offer such incentives to encourage the move from cash to digital payments? Further, it is often difficult to impossible for individuals to save. All their income must go to present needs. But, digital payment systems offer possibilities for individuals to segregate even small amounts in one or more categories. Say an individual is incentivized and decides to set aside even very modest amounts. These kinds of nudges can have a tremendous impact.

In many countries, fees are required to attend school. School fees and costs for tuition, books, uniforms, and supplies are an important parental priority. Parents will go without to pay their children's school fees. It can be difficult to amass the necessary sums and make the payments on time. This is a high-stakes, emotional situation. Cash transactions make

the parents and schools vulnerable to muggings and robberies. How might digital payments be employed to ease the burden of school fees? Is it possible to enable parents to make digital payments, and the schools and other payment recipients to receive digital payments, rather than cash? If there are governmental payments or subsidies for some school expenses, how can the flow be improved or simplified so that the student receives the educational services, but the parent does not have to lay out money upfront? Is it possible to set up systems that permit parents to pay school fees in small amounts over time, rather than having to come up with intermittent lump sums, often a much more difficult task?

Literacy, writ broadly, includes reading, critical thinking, and financial rudiments. For example, whether a woman can read is the biggest influence on whether her children, boys, and girls, will learn to read. These literacy skills will enable more people to navigate the sea of information to find and use the material that will have meaning to them and improve their lives. While school systems offer many subjects and activities beyond the academic, there is scant to no attention on elementary financial training, such as budgeting and basic financial products like checking, debit cards, and credit cards. Financial literacy lends itself well to online curricula, which could easily be designed for particular demographics and needs and even gamified. These simple steps could greatly empower individuals.

In 2020, remittance flows totaled $540 billion, with an "average remittance of US$200-US$300 a month."

While the percentage of the population that is middle class is stagnating or growing slowly in other parts of the world, the Asia-Pacific region has experienced and is anticipated to continue significant growth in its middle class. "In 2020, an estimated 2 billion Asians were members of the middle class, and that number is set to increase to 3.5 billion by 2030." However, the global pandemic has placed a check on this growth, particularly in some Asia-Pacific regions, which underscores that these significant gains exhibit some fragility and would benefit from buttressing by stronger digital financial systems. One area of exploration would be postal accounts, leveraging and modernizing them with accessible and convenient digital payments systems.

Migration is "[t]he movement of persons away from their place of usual residence, either across an international border or within a State. The word "migrant" can be broadly applied to a range of individuals. As of 2016, 247 million people lived in another nation than their native country, 90% of whom left voluntarily. As a result, there is a surge in global migration, which is expected to continue.

Migrants begin putting down roots in their new location, including the economic activities of getting a job and setting up a household. They often still have strong ties in their native country, including financial obligations and transactions. They need financial services to establish themselves in the new location and send money abroad.

Remittances are "[p]rivate international monetary transfers that migrants make, individually or collectively." On the International Day of Family Remittances (IDFR) on June 16, 2021, the IDFR "recognize[d] more than 200 million migrant workers, women, and men, who send money home to over 800 million family members." These one billion individuals participate in remittance flows that have quintupled in 20 years. In 2020, remittance flows totaled $540 billion, with an "average remittance of US$200-US$300 a month."

Remittances offer the opportunity to provide digital financial services to facilitate these cross-border transfers and provide more secure channels to convey funds. First, it would be useful to review current remittance flows, including fees and other charges. Then, alternatives could be explored to offer safer, more streamlined services, reduce fees, and permit the allocation of funds to multiple accounts or recipients, which might permit funds to be set aside for larger or longer-term needs.

For women, the Asia-Pacific middle class, migrants, and others, how might more participation in digital payments enhance their lives? It is important to look from the perspective of the underbanked individuals, rather than from the viewpoint of financial institutions and payment providers, to consider their priorities, needs, and experiences and re-imagine their daily lives as facilitated and enhanced by digital payments. Flipping the vantage point may reveal new alternatives to assist their economic and social wellbeing. The focus should be scalable solutions that address pain points. There is no shortage of friction. Some is already well recognized. What are some other, less obvious needs that, when resolved,

Reducing difficulty and complexity are clear goals. Digital payments may do both and, indeed, render payments a more seamless or background activity.

would improve lives? In this article, several suggestions were made: for women, school fees; for the Asia-Pacific middle-class, leveraging postal accounts; and for migrants, remittances.

Reducing difficulty and complexity are clear goals. Digital payments may do both and, indeed, render payments a more seamless or background activity. But, transparency and control are key in order to sustain confidence that the system will function to the individual's benefit, without surprises, which can be especially costly in lives with less margin for error. Indeed, the effects of malfunction or failure could be catastrophic. Automatic payments, while usually less drastic in result, can be a possible source of concern and are another good example of where transparency and control are essential. While automated payments can be beneficial, the individual needs simple means to adjust, control, or disable them as financial situations change.

CONCLUSION

This paper sets the groundwork for case studies of relevant sectors, populations, and geographic areas. These case studies will be illustrative in themselves but will also be selected for their representative elements and broader applicability.

Among underbanked individuals, there are financial decision-makers whose increased inclusion will benefit themselves and the wider community. They are important financial actors in their domains. Moreover, through their networks, they have the capacity to influence other underbanked individuals toward greater participation in traditional financial systems, including digital payments. Three such significant stakeholders are women, the middle class in the Asia-Pacific region, and migrants taking part in the current global surge in migration.

This paper briefly discussed these three sets of actors, sketching their participation and barriers to more inclusion. Building upon that initial introduction, each case study will go into greater depth.

NOTES

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[3] The Global Findex 2017 stated that there were approximately 1.7 billion unbanked individuals around the world, defining this category as "without an account at a financial institution or through a mobile money provider." Demirgüç-Kunt, Asli, Leora Klapper, Dorothe Singer, Saniya Ansar, and Jake Hess. 2018. The Global Findex Database 2017: Measuring Financial Inclusion and the Fintech Revolution. Washington, DC: World Bank. doi:10.1596/978-1-4648-1259-0. License: Creative Commons Attribution CC BY 3.0 IGO, p. 4.

[4] "The future of the world's population is urban. With more than half of the world's people living in urban areas (55 per cent, up from 30 per cent in 1950), urbanization determines the spatial distribution of the world's population and is one of the four demographic mega-trends, with the growth of the global population, population ageing, and international migration. Estimates and projections of urbanization introduced in this report indicate that the future growth of the human population can be accounted for almost entirely by a growing number of city dwellers. By mid-century, roughly two thirds (68 per cent) of the world's population will be living in urban areas." United Nations, Department of Economic and Social Affairs, Population Division (2019). World Urbanization Prospects: The 2018 Revision (ST/ESA/SER.A/420). New York: United Nations, p. 1.

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[8] "A nonbank financial institution (NBFI) is a financial institution that does not have a full banking license and cannot accept deposits from the public. However, NBFIs do facilitate alternative financial services, such as investment (both collective and individual), risk pooling, financial consulting, brokering, money transmission, and check cashing. NBFIs are a source of consumer credit (along with licensed banks)." World Bank. 2019. Global Financial Development Report 2019/2020: Bank Regulation and Supervision a Decade after the Global Financial Crisis. Washington, DC: World Bank. doi:10.1596/978-1-4648-1447-1. Key Terms Explained, https://www.worldbank.org/en/publication/gfdr/gfdr-2016/background/nonbank-financial-institution (accessed October 31, 2021).

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