Leveraging Digital Financial Services for Financial Inclusion in the Philippines: An Initial Assessment

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ABSTRACT

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Countries, including the Philippines, are considering ways of leveraging the widespread use of mobile phones and rapid digital innovations to promote financial inclusion. With the potential to reach a greater number of individuals and households, digital financial services (DFS) could help address a significant portion of the unmet demand for payments services and credit needs of the unbanked and underserved segments of society. The ease of access and affordability that DFS provide have allowed millions of poor individuals and households to move from purely cash-based transactions to formal financial services. These developments have, in turn, led to improved household welfare and contributed to overall economic growth. This study explores the potential of DFS in promoting financial inclusion in the Philippines. It contributes to the existing literature by 1) providing an empirical assessment of Filipino households' use of DFS and the factors that affect it; and 2) examining the impact of the use of DFS on Filipino household welfare. Our results indicate that the use of DFS by Filipino households are significantly affected by factors that include educational level, ownership of deposit account, and access to the internet. Moreover, the use of DFS can contribute to the improvement of household welfare.

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1.   Introduction

Financial inclusion is an important tool in alleviating poverty and increasing economic growth in emerging and developing economies. It is a state wherein individuals, households and businesses have access to useful and affordable financial products and services that meet their needs (i.e., transactions, payments, savings, credit, and insurance) and which are delivered in a responsible and sustainable way (World Bank, 2018). While significant strides have been made in promoting financial inclusion in many countries, 1.7 billion adults, or almost a third of the global adult population, remain unbanked or without access to formal financial services like savings and credit (Demirguc-Kunt et al., 2017). Moreover, an estimated 200 million businesses in emerging economies lack access to credit (Manyika et al., 2016).

Countries, including the Philippines, have considered ways of leveraging the widespread use of mobile phones and rapid digital innovations to promote financial inclusion. With the potential to reach a greater number of individuals and households, digital solutions could help address a significant portion of unmet demand for payments services and credit needs in the bottom of the pyramid (BoP)[1] and the micro, small, and medium enterprises (MSMEs) segments (ADB, 2017). Banks and non-banks have developed and offered digital financial services (DFS) to their traditional clients but have been expanding their client base to include the financially excluded and underserved segments of society. The ease of access and affordability that DFS provide have allowed millions of poor individuals and households to move from purely cash-based transactions to formal financial services (CGAP, 2015). These developments have, in turn, led to improved household welfare and contributed to overall economic growth.

This study explores the potential of DFS in promoting financial inclusion in the Philippines. It contributes to the existing literature by 1) providing an empirical assessment of Filipino households' use of DFS and the factors that affect it; and 2) examining the impact of the use of DFS on Filipino household welfare.

Our results indicate that the use of DFS by Filipino households are significantly affected by factors that include educational level, ownership of deposit account and access to the internet. Households that are better educated are more likely to use DFS as compared to households with lower educational attainment. The use of DFS, or a digital platform, tend to require skills equivalent to a certain level of education (e.g., at least secondary level). This is in line with the observation that early adopters of digital finance tend to have higher levels of education. Additionally, the ownership of deposit accounts can encourage the use of DFS. Online financial transactions like bank transfer, payment for purchases using

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[1] The Bottom of the Pyramid (BOP) is a socio-economic concept that pertains to the largest (estimated to be in excess of about four billion) but poorest groups of the world's population, who live with less than US$2.50 a day and are excluded from the modernity of our globalized civilized societies, including consumption and choice as well as access to organized financial services. (Source: http://lexicon.ft.com/Term?term=bottom-of-the-pyramid-(BOP))

ATM/debit card, and e-money transactions are often linked to a deposit account. Households' internet access is also found to have a positive and significant effect on the use of DFS. Regions (e.g., the National Capital Region (NCR), Region IV-A and Region III) that have higher proportion of households with internet access tend to also have higher proportion of DFS users.

One of the key findings of this study is that digital financial inclusion, as proxied by DFS use, can contribute to the improvement of household welfare. Households that have higher demand, not only for financial services in general, but also for DFS in particular, have higher per capita income or per capita expenditure. It is interesting to note that higher-income or higher-spending households tend to be managed by economically dominant person/s who are more educated, have job or business, and have more positive attitude towards financial matters. This group of households may have adopted DFS mainly because doing financial transactions via digital platform can provide convenience as well as savings in terms of time and cost.

The next section gives a brief overview of financial inclusion and digital financial services. The third section discusses the survey data used and estimation methodology. The fourth section presents the empirical results and analysis. The fifth section offers some policy initiatives and directions to leverage the use of DFS for financial inclusion. The last section concludes.

2.   Financial inclusion and digital financial services (DFS) in the Philippines

Financial inclusion has been strongly advocated by various stakeholders, including governments, people's organizations, international institutions, and other interest groups. An expanding literature has also underscored the relevance of financial inclusion for poverty reduction, welfare improvement and economic growth. Nowadays, financial inclusion is getting some boost from developments in digital technologies and innovations. DFS are expected to reach a wider population, provide better access, and be more affordable.

Financial inclusion in the Philippines

Having a transaction account is the initial step to financial inclusion. A transaction account allows individuals, households and businesses to save money, make payments, and send and receive remittances and transfers. It is also the means through which these economic agents are able to access other financial services like credit and insurance. Access to financial services enable households and businesses to better plan their consumption, spending, and investment decisions as well as prepare for unforeseen events like emergencies and financial shocks. These can help improve the quality of lives and contribute to better well-being.

In the Philippines, the General Banking Act (GBA) of 2000 mandated the BSP to set the rules and regulations for the practice of microfinance within the banking sector. The BSP would later expand its advocacy on microfinance to inclusive finance and became the first central bank in the world to create a dedicated office for financial inclusion in 2007. In 2015, the BSP together with relevant stakeholders launched the National Strategy for Financial Inclusion (NSFI). The NFSI provides the national vision for financial inclusion and a platform for public and private sector coordination to ensure synergy of efforts in achieving shared objectives. With the signing of Republic Act (RA) No. 11211 on 14 February 2019, financial inclusion and its complementary objectives of financial literacy and consumer protection became a mandate for the BSP.

While important milestones have been achieved, the Philippines still has a long way to go in attaining its financial inclusion objectives. In the 2019 BSP Financial Inclusion Survey (FIS) Report, a little more than 71 percent of Filipino adult population or around 51.2 million Filipinos continue to lack ownership of a transaction account. Moreover, relative to its ASEAN peers, the Philippines lags behind in the onboarding of its adult population to the formal financial sector (World Bank Global Findex, 2017; Figure 1). Formal account ownership as percent of the country's adult population stood at 26.6 percent in 2011, increasing to 31.3 percent in 2014 and improving to 34.5 percent in 2017. The average for East Asia and Pacific economies was more than twice the figures for the Philippines at 59.9 percent in 2011, 71.9 percent in 2014, and 73.7 percent in 2017.

Figure 1. Ownership of formal account
(as percent of adult population[1])
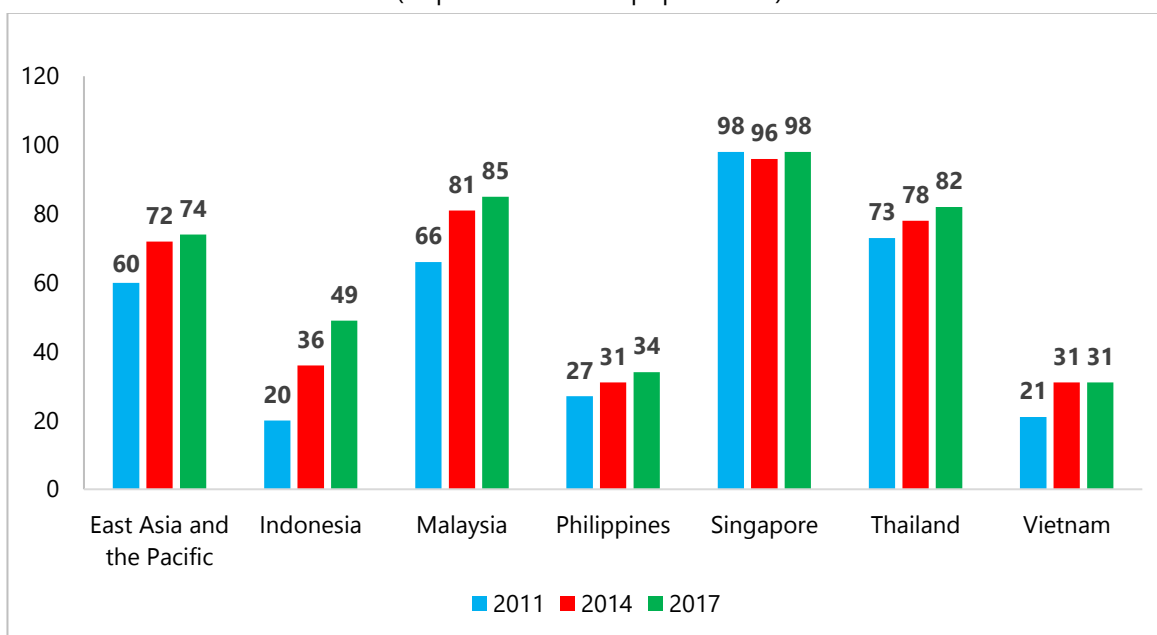
[1] Respondents are individuals 15 years old and above (i.e., adults).
Source: World Bank Global Findex, various years

Towards digital financial inclusion

To boost financial inclusion initiatives, the Philippines is leveraging on the use of digital technologies and innovations. Digital innovations could play an enabling role in the provision of financial services to a significant number of the population that remains unreached and unserved by traditional market players due to physical barriers and costs. Moreover, digital technologies have the potential to deliver financial services at much lower costs and promote financial access. These, in turn, would lead to wider financial inclusion and larger productivity gains for the economy.

In the Philippines, the digitalization of payments and promotion of financial inclusion are seen as being mutually reinforcing. Payments continue to be the most common financial transaction for Filipinos. According to the 2019 BSP FIS, 61.2 million Filipinos, or 85 percent of the adult population, make and receive payments in various forms, including as income (i.e., salaries, benefits, pension, dividends, or income from business), loan proceeds and insurance pay-outs. Cash remains the most preferred means of payment and these are usually done over-the-counter (OTC). In 2015, the BSP launched the National Retail Payment System (NRPS), the flagship program for digital finance. The NRPS intends to facilitate the access of every Filipino to financial services, utilize their account to make payments as well as receive and transfer funds to other account at any time and day and at reasonable prices through the use of digital devices.

The Digital Transformation Roadmap 2020–2023, which was launched in 2020, is expected to further reinforce the thrust towards a cash-lite society and to broaden financial inclusion in the country. The roadmap aims to convert 50 percent of the total volume of retail payments into digital form and expand the financially included to 70 percent of Filipino adults through the use of payment or transactions accounts. Moreover, the roadmap sees the development of more innovative and responsive DFS.

A key element that would support these objectives is the implementation of the Philippine Identification System Act (PhilSys). The PhilSys establishes a single national identification system for all citizens in the country. It is expected to strengthen financial inclusion[2] in the country as identification is usually required for opening transaction accounts, obtaining loans and credit, as well as in enrolling in social welfare programs (D'Silva et al., 2019).[3] As a foundation for a digital ID system, the PhilSys will help transform

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[2] In India, the implementation of a unique biometric identity system, known as Aadhaar (Hindi for "foundation" or "base"), provided a strong impetus to financial inclusion as well as innovation in the delivery of financial services. The adoption of Aadhaar contributed to the remarkable increase in bank accounts in India. Between 2011 and 2017, an estimated 470 million Indian adults opened a bank account in a financial institution (D'Silva etal., 2019). As a proportion of the adult population, individuals with bank accounts significantly increased from 35 percent in 2011 to 80 percent in 2017 (Global Findex, 2017).

[3] Using the Global Findex database, D'Silva et al. (2019) observed a strong, positive relationship between the proportion of the population with an ID and those with a bank account. With verifiable IDs, individuals are able to open bank accounts with ease, access financial services like credit, loans and insurance as well as enroll in social welfare programs.

the delivery and access of Filipinos to services and accelerate the transition to a digital economy.

Digital payment is but one of the DFS offered by banks and non-banks. DFS pertain to financial services (e.g., payments, credit, savings, transfers) that are delivered through mobile phones, personal computers, the internet, or cards linked to a reliable digital platform/infrastructure (Ozili, 2018; Manyika et al., 2016). Access to these services is expected to contribute to poverty alleviation and to the attainment of financial inclusion goals of developing countries (UN ITU, 2016). DFS are commonly made up of three main components – a digital transactional platform, a network of retail agents, and the device through which customers and agents access the financial services (CGAP, 2015; Figure 2).[4] In many countries, mobile phones have been the key access device for DFS. Estimates show that there are 5.27 billion unique mobile users worldwide, which implies that more than two-thirds of all individuals in the world own a mobile phone (Kemp, 2021). Through these mechanisms, financial services such as payments and transfers, savings, credit, insurance as well as investments can be provided digitally for individuals and households, including those who are financially excluded and underserved.

Figure 2. The Digital Financial Services Ecosystem
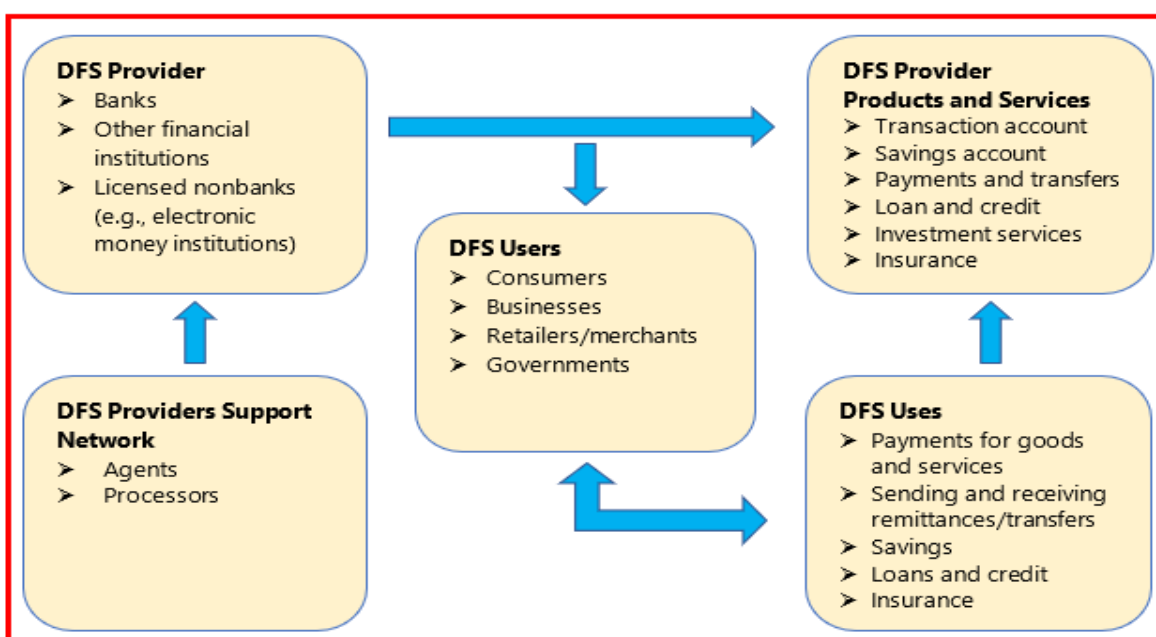
Source: Adapted from ITU (2016)

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[4] Digital transactional platform allows individuals to make or receive payments and transfers and to store value electronically through the use of a device that transmits and receives transaction data, and which is connected to a bank or a non-bank institution. Meanwhile, retail agents use a digital device connected to a digital infrastructure to transmit and receive transaction details that enables clients to convert cash into electronically stored value and vice versa. The access device can be digital like a mobile phone that is used to transmit data and information or an instrument, such as a payment card, that connects to a digital device.

Access to and use of DFS by the unbanked and underserved segments of the population have been referred to as digital financial inclusion (CGAP, 2015). Between 2014 and 2017, Sahay et al. (2020) observed that digital financial inclusion increased, particularly in Africa and Asia, even where traditional financial inclusion was stalling or declining. Moreover, digital financial inclusion fills the gap in areas where the traditional delivery of financial services is less present.

Digital financial inclusion can lessen the occurrence of loss, fraud and theft – risks that are commonly associated with loss, fraud and theft. It can likewise help reduce the cost of transacting in cash. Eventually, digital financial inclusion is seen as contributing to economic growth by facilitating asset accumulation and increasing economic participation, particularly of women (World Bank Development Research Group, Better than Cash Alliance, and Bill & Melinda Gates Foundation, 2014; CGAP, 2015).

Digitally-driven financial inclusion: benefits and risks

Estimates have shown that the acceleration of financial inclusion through digital means could significantly contribute to economic growth. The widespread use of DFS could raise annual GDP of all emerging economies by a total of six percent, or US$ 3.7 trillion, by 2025 (Manyika et al., 2016).[5] Around two-thirds of the increase is accounted for by the expected increase in productivity of financial and non-financial firms and governments as a result of digital payments. One-third would be from the additional investment that broader financial inclusion of individuals, households and MSMEs business would bring. The small remainder would come from the time saved by individuals in doing their financial transactions which could translate to more hours of work. The projected economic growth could lead to the creation of up to 95 million jobs across all sectors.

Meanwhile, ADB (2017) estimates that the Philippine GDP could increase by more than 14 percent if the financial inclusion gap[6] were closed. An integral part of this solution is digital enablement. Digital innovations could produce more than US$7 billion in additional electronic payment flows, lead to more than US$ 4 billion in additional credit uptake, and mobilize more than US$ 7 billion in savings. These opportunities could boost the country's GDP by about three percent and yield an increase of about 11 percent in the incomes of the population segment earning less than US$2 per day.

Furthermore, Sahay et al. (2020) argued that digital innovations could play a significant role in mitigating the economic fallout from the COVID-19 pandemic and

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[5] Manyika et al. (2016) used McKinsey's proprietary general equilibrium macroeconomic model to calculate the impact of digital finance on the level of GDP of emerging economies. The estimated impact hinges on two important assumptions: 1) digital payments in emerging economies should grow by 25 to 50 percent of total transactions by volume; and 2) at least 91 percent of adults gain access to financial services.

[6] Financial inclusion gap refers to the difference between the demand of the poorest households (i.e., households living on less than US$2.50 a day), women, and MSMEs for financial services (i.e., payments and transfers, savings, credit, and insurance) and the supply that the formal financial sector provides.

provide support to the recovery given that countries with higher digital financial inclusion can: 1) ensure continued access to financial services while adhering to physical distancing measures; 2) deliver government subsidies and support effectively and securely; and 3) support consumption, investments, innovations, and productivity through developments in the digital economy.

Nonetheless, while digital innovations can provide a significant boost to financial inclusion, there are also attendant risks to these developments. Mobile applications and the required infrastructure support need to be seamlessly integrated to work. From a financial stability standpoint, this could invoke risks associated to interconnectedness (at the users and transactions level) and interoperability (at the backroom and infrastructure level). Moreover, cybersecurity risks and data privacy issues could undermine the trust of individuals, households and firms in the system. There is also the possibility that the growth in digital lending could lead to relaxation of credit standards.

DFS can also pose risks to financial inclusion. These risks could result from unequal access to digital infrastructure, limitations to financial and digital literacy, and potential biases magnified by new data sources and data analytics (Sahay et al., 2020). The possibility of a digital divide (e.g., lack of connectivity and access to digital platforms) could lead to financial exclusion rather than inclusion.

3. Demand for digital financial services in the Philippines: empirical observations and results from a household survey

To assess the potential of the use of DFS in promoting financial inclusion in the Philippines, we look at the demand of Filipino households for these kinds of services and determine the factors that affect it. We also examine the impact of the use of DFS on overall household welfare.

Data

This study utilized the 2014 Consumer Finance Survey (CFS) dataset, which is a nationwide triennial[7] survey of the Bangko Sentral ng Pilipinas (BSP) on the financial conditions of Filipino households. The survey collects data on households' demographic characteristics, ownership of financial and non-financial assets, outstanding liabilities, income and employment, business, expenditure, as well as risk preference and behavior. The CFS was primarily developed to address the data gaps on household wealth and indebtedness in the country and to complement the Family Income and Expenditure Survey (FIES) and Annual Poverty Indicators Survey (APIS) of the Philippine Statistics Authority (PSA).

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[7] The CFS was conducted every four years. Starting 2018, the CFS will be conducted every three years, per Monetary Board Resolution No. 1802 dated 26 October 2017.

The survey covered a total of 18,000 households that were randomly selected from the 2003 Master Sample for Household-Based Surveys of the PSA, which adopted a two-stage cluster sampling scheme. With a response rate of 86.1 percent, the 2014 CFS dataset contains a total of 15,503 observations.[8]

Estimation

The instrumental variables (IV) regression was employed in this study to determine the factors affecting the Filipino households' use of DFS[9] and to examine whether the use of DFS significantly affects household welfare as measured by their income and expenditure levels. The two-stage IV regression model was estimated to address the potential endogeneity between the use of DFS and household welfare. Due to data limitations, the provincial-level variable on the proportion of households with internet access was used as instrument. The first- and second-stage equations of the IV model are as follows:[10]

$$y = w\theta + \mathbf{X}\boldsymbol{\beta} + \varepsilon \qquad (1)$$
$$w = \mathbf{Z}\boldsymbol{\alpha} + \tau \qquad (2)$$

Equation 1, which is the second-stage or outcome equation, estimates the household welfare, y, based on the use of DFS variable, w, and a set of observed household characteristics, $\mathbf{X}$. θ and $\boldsymbol{\beta}$ are the coefficients of the DFS variable and a set of observed household characteristics, respectively. ε is the error term, which is assumed to be normally distributed and is independent from the right-hand side variables, w and $\mathbf{X}$.

Equation 2, which is the first-stage or DFS equation, tests whether or not the DFS, w, is influenced by a set of household characteristics, $\mathbf{Z}$. $\mathbf{Z}$ is basically $\mathbf{X}$ plus IV. $\boldsymbol{\alpha}$ contains the coefficients of a set of observed characteristics and the IV while τ is the error term that is assumed to have a normal distribution and is independent from $\mathbf{Z}$.

The propensity score matching (PSM) was also employed as a robustness check to the results of the IV regression. In the PSM, the treatment (DFS users) and comparison (non-DFS users) samples were restricted to households with similar observable characteristics. The top 30 percent income or expenditure group was used as the outcome variable and the set of household characteristics, $\mathbf{X}$, was used in the comparison of samples.

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[8] The 2014 CFS round did not cover households in the Autonomous Region in Muslim Mindanao (ARMM) due to security concerns and Leyte due to households' displacement after the Typhoon Yolanda. For more details, readers may refer to the 2014 CFS report, which can be accessed at 2014 CFS Main Report Pages 1-38 (bsp.gov.ph).

[9] DFS covered in the 2014 BSP CFS include e-money, mobile banking, internet banking, ATM/debit card, and credit card.

[10] The specification of these two equations follows those in Llanto (2015).

Variables

We use as outcome variables the natural logarithm of household per capita income and expenditure.[11] Per capita income and expenditure are commonly used as measures of household welfare. Meanwhile, our variable of interest is the use of DFS.

In the first-stage equation, use of DFS is the dependent variable and is hypothesized to be affected by factors like location and other household characteristics. In the second-stage equation, use of DFS is hypothesized to have a positive effect on household welfare. It is assumed that the use of DFS facilitates households' access to savings, credit, insurance, and eases payments and transfers. These financial services can, in turn, enable households to undertake productive activities. Moreover, the use of DFS can result in lower transactions costs for households (i.e., in terms of time, cost, and energy spent) as they would no longer have to go to and queue at traditional brick-and-mortar offices to do financial transactions.

The DFS variable is assumed to be correlated with household welfare. Thus, it needs to be instrumented by another variable that is strongly correlated with the DFS variable but with no direct relationship with household welfare. Due to data limitations, the proportion of households with internet access (sourced from the PSA's 2010 Census of Population and Housing) is used as the IV in this study.[12]

The set of household characteristics used in this study are as follows.[13] These are the factors hypothesized to have significant effects on the use of DFS or household welfare, or both.

(1) Location: whether the household is located in an urban or a rural area;
(2) Profile of the survey respondent, as follows: age, sex, marital status, financial status, highest educational attainment, and employment status;[14]
(3) Household composition or number of dependent members (aged 0–4 years old and at least 65 years old);

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[11] We note that a household in the CFS dataset is limited to the primary economic unit (PEU). The PEU consists of the survey respondent, his/her spouse/partner (if any), and other members of the household who are financially interdependent on the couple. Nonetheless, the term "household" is used throughout the paper. Thus, household income and expenditure here are income and expenditure, respectively, of the PEU.

[12] This variable, which is the average of the proportion of households with internet access from home and that of household with internet access elsewhere, is the only variable that is not sourced from the CFS dataset.

[13] These are limited to those that are available in the CFS dataset.

[14] The profile of the respondent is considered in this study, and not of the head, because only the respondent is asked in all items. Items like ownership of financial assets, outstanding other loans, financial attitude, risk preferences, etc., are only asked from the respondent. The respondent is an adult person (at least 18 years old) living in the household who is the most knowledgeable and credible to answer questions about household finances—either the head, his/her spouse/partner or any knowledgeable member with a significant contribution in the household's finances.

(4) Respondent's ownership of at least one deposit account (any type), which is held by either a bank or a non-bank institution, e.g., non-stock savings and loan association, cooperative or microfinance institution;

(5) Financial attitude of the respondent, which is measured by a number of Likert-type items on his/her feeling about money, savings, spending, and planning for the future and converted into an index using the Principal Component Analysis (PCA);[15]

(6) Household's ownership or co-ownership of a business, regardless of percentage of ownership or management structure; and

(7) Respondent's preference/behavior, measured by his/her responses to items related to risk attitude and time discounting. For the risk attitude question, the respondent is asked about his/her willingness to undertake a new business venture that could possibly increase their current level of income. For the time discounting question, the respondent is asked, suppose he/she won a raffle prize of ₱10,000 cash, to choose between receiving ₱10,000 cash immediately or getting ₱10,500 after a month.

Table 1 in the Appendix presents a more detailed description and summary statistics of the variables used in model estimation. Meanwhile, Table 2 lists all items in the CFS questionnaire that are related to DFS and, thus, used in the generation of the DFS variable.

4.   Empirical results

The first-stage estimation results are shown in Tables 3 and 4 in the Appendix. Empirical results reveal that the following factors have highly significant effect on the use of DFS: (i) respondent's education; (ii) respondent's ownership of deposit account; and (iii) households' internet access.[16]

Respondents with higher educational attainment are more likely to use DFS as compared to their less-educated counterparts. This is consistent with the findings of similar studies (e.g., Azeez and Akhtar, 2021; Ghosh and Chaudhury, 2020).[17] Figure 3 reveals that DFS users, albeit fewer relative to non-users, are larger in proportion at higher educational levels. Apparently, the use of DFS, or at least a digital platform, may require skills equivalent to a certain educational level (i.e., at least secondary level). Morgan et al. (2020) noted that, in fact, early adopters of digital finance tend have high level of education.

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[15] The PCA is a multivariate statistical technique commonly used to resolve the multicollinearity problem.

[16] Having a partner was also found to have a positive effect on the use of DFS but only for the expenditure equation. Some male respondents are more likely to be DFS users as well, although the correlation is not that strong.

[17] Respondents, who must be the economically dominant members, might have been the main or frequent users of DFS within their household.

Figure 3. Proportion of users of DFS,[1/] by educational level
(in percent)

Ownership of deposit account also induces use of digital finance. While majority of DFS users do not have any deposit account, the proportion of DFS users with a deposit account is relatively higher than that of DFS users without a deposit account (Figure 4). One possible explanation is that financial transactions done via online are often linked to a deposit account. These transactions include online bank transfer, payment for purchases using ATM/debit card, fund transfer from bank account to e-money account, among others.

Figure 4. Proportion of users of DFS,[1/] by status of ownership of deposit account
(in percent)

The instrument, households' internet access, is found to have a positively significant effect on the use of DFS,[18] with or without the presence of other regressors (or household characteristics). As shown in Figure 5, regions that have higher proportion of households with internet access tend to also have higher proportion of DFS users, i.e., the NCR, Region IV-A and Region III.

Figure 5. Proportions of households that are DFS users and those with internet access, by region
(in percent)

Source: 2014 Consumer Finance Survey, Bangko Sentral ng Pilipinas

In the second-stage estimation results, the main finding is the large, positive, and highly significant effect of the use of DFS on both income and expenditure of households. Th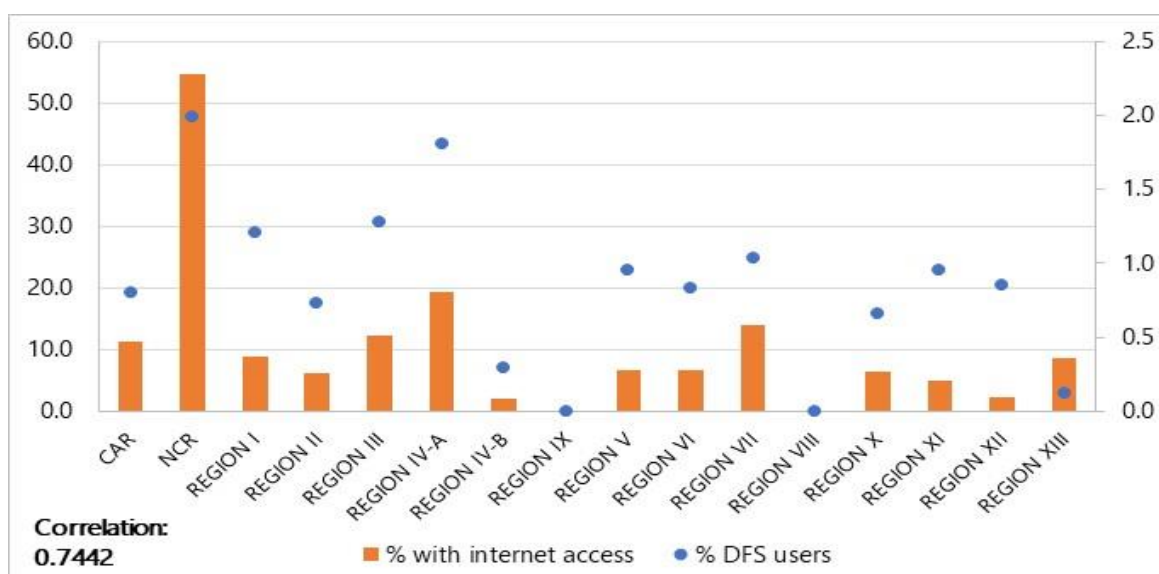ese results provide evidence that digital financial inclusion, as proxied by DFS use, can contribute to the improvement of the household welfare, either through higher per capita income or expenditure. Households that are relatively better-off in terms of these welfare measures have higher demand, not only for financial services in general, but also for DFS in particular. As shown in Figure 6, DFS users are more concentrated in the upper deciles, particularly the top 20 percent (Figure 6).[19] These findings are also supported by the results of the PSM in that DFS users are more likely to have higher per capita income or expenditure than the non-users.[20]

The estimation results also revealed that the higher-income or higher-spending households tend to be managed by economically dominant person/s who are more

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[18] The use of DFS was confirmed to be an endogenous variable so it must really be instrumented.

[19] The effects of income and expenditure on the use of DFS will be explored in the next paper.

[20] The outcome variables used in the PSM are indicators of whether the household belongs to the top 30 percent income and expenditure groups, or not.

educated, have job or business, and have more positive attitude towards financial matters. This group of households may have adopted DFS mainly because doing financial transactions via digital platform can provide convenience as well as time and cost savings to them.

**Figure 6. Proportions of households that are DFS users,
by per capita income and expenditure decile**
(as percent of DFS users)
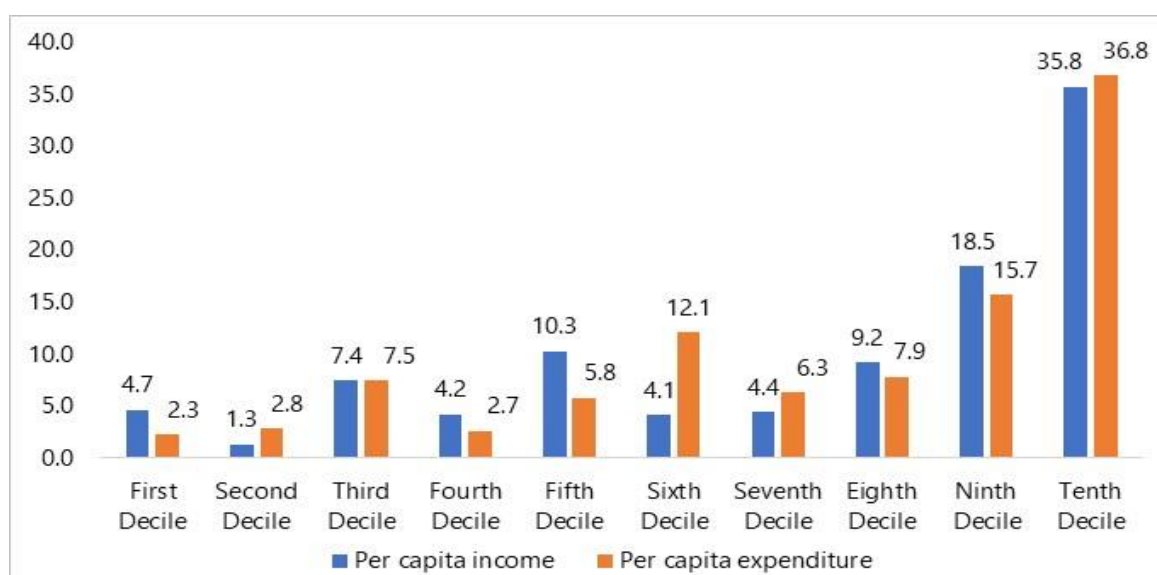
Source: *2014 Consumer Finance Survey, Bangko Sentral ng Pilipinas*

5.   Policy initiatives and directions

While a positive correlation has been observed to exist between the use of DFS and financial inclusion (ADB, 2017; Sahay et al., 2020; Ozili, 2018), the results in the previous section highlighted that the relationship is stronger for certain groups of households (e.g., with internet access, better educated, higher income). Thus, the potential of DFS for financial inclusion, particularly for the low-income households may not be fully realized. Concerns have even been raised for the possibility of a digital divide[21] that could, in turn, lead to financial exclusion instead of inclusion.

In this section, we highlight some policy initiatives and directions that could help leverage the use of DFS for financial inclusion in the Philippines. These include:

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[21] Digital divide pertains to the uneven distribution of information and communication technologies in society. It refers to the differences in both access and usage. These differences can compound existing social inequalities and cause persistent information and knowledge gap between people with access and those without. Moreover, it can lead to a gap between those who are able to benefit from the digital age and those who do not. (Source: https://www.britannica.com/topic/digital-divide)

1) addressing digital infrastructure gaps; 2) expanding financial education and digital literacy programs; and 3) creating financial inclusion opportunities and possibilities.

Addressing digital infrastructure gaps

Digital infrastructure gaps, including the lack of internet access, could result in a significant digital divide in the Philippines. In 2018, only 60.1 percent of the country's total population and 42.7 percent of total households have internet access (ITU, 2018). These estimates imply that there remains a large portion of the population and households that are unable to access online and digital services. Moreover, those with access have to pay a high cost for broadband and other internet services. These factors could hinder the access of individuals and households to DFS.

The national government (NG) recognizes the importance of establishing a stronger digital infrastructure for the Philippines to reap the benefits of digitalization. Key initiatives have been developed and implemented, including the National Broadband Plan (NBP), free public wi-fi program, and entry of a third major telecommunication provider.

In 2017, the NG, through the Department of Information and Communications Technology (DICT), rolled out the National Broadband Plan (NBP). Over a period of 10 years (i.e., 2017–2027), the NBP aims to: i) accelerate investments; ii) mobilize and engage public and private sectors; iii) connect more places; and iv) increase the take-up rate (Bhunia, 2017). The NG intends to accelerate investment, particularly in the countryside, to attract existing and new market players to invest in unserved and undeserved areas and improve services to currently served areas. The NG likewise seeks to engage the public and private sectors in the development of the telecommunications and ICT sector. Initiatives under the NBP aim to connect government agencies, health institutions, MSMEs, among others, to the broadband infrastructure. Additionally, programs and interventions will be provided to stimulate the demand for broadband such as promotion of the use and production of local content and applications, conduct of digital literacy programs and introduction of fiscal incentives to broadband users.

The Free Internet Access in Public Places Act of 2017 targets to provide internet access to over 100,000 public sites nationwide by 2022. However, despite having a huge budget, the program was faced with challenges that hindered its implementation. Since 2015, only 3,283 free wi-fi sites, or roughly 3 percent of the target, has been put in place (Free Public Wi-Fi Office, 2020).

One of the often-cited issues hampering the efficient provision of internet service, including the high cost of broadband services, in the country is the existing market structure in the telecommunications sector. Thus, in 2019, the NG awarded a license to a third telecom company. The entry of a new market player in the telecom industry is expected to result in better internet service as well as wider coverage.

There still has much to be done to improve the country's digital infrastructure. The Philippines should take note of the substantial budget and major initiatives that neighboring ASEAN countries (e.g., Thailand, Malaysia, Vietnam) have been undertaking to strengthen their digital infrastructure. It is crucial for the Philippines to strengthen its digital infrastructure to take full advantage of the benefits of digitalization, including for greater financial inclusion.

Expanding financial education and digital literacy programs

Having a financially literate population implies that every Filipino can make prudent financial decisions which will contribute to improved welfare and to higher productivity of the Philippine economy. To achieve this, financial education and information dissemination are crucial. It is through these programs that the public acquire the knowledge and skills to make well-informed economic and financial choices and decisions. Additionally, it gives them confidence and trust in the financial system and its processes.

For its part, the BSP has been conducting public information campaigns (PICs) and other economic information learning sessions in the different parts of the country targeted at audiences from various sectors of society. Additionally, the BSP, in partnership with a private foundation, have been collaborating with key government agencies, including the Department of Education (DepEd), the Civil Service Commission, the Overseas Workers and Welfare Administration (OWWA), and the Armed Forces of the Philippines, in implementing a Financial Education Program for students, government employees, overseas Filipinos and their families, and military personnel.

The BSP also implements a Digital Literacy Program as part of its financial education advocacy. The Program aims to increase public trust and confidence in the digital finance ecosystem and encourage greater usage of DFS by consumers across all sectors — individuals, corporations, businesses, and even government institutions. Through these information campaigns, consumers are informed and educated to generate familiarity with DFS and reduce their vulnerability to usage errors, scams and frauds. Also, these information sessions provide consumers with the relevant information and awareness that help mitigate the risk of loss, protect consumer welfare, and ensure positive customer experiences and outcomes.

Recognizing the potential reach of social media, the BSP and other relevant agencies (e.g., banks) have been disseminating information on financial products and services. Filipinos are some of the world's most digitally connected people. Filipinos spend an average of 11 hours online per day, which is the highest in the world. Social media takes up four hours of this time and more than five hours are spent on mobile internet (Kemp, 2021). Thus, innovative, informative, and interactive social media content on financial education and digital literacy that targets different demographics can be a significant tool for promoting the use of DFS and financial inclusion. Popular social media platforms like video logs (vlogs), Twitter, Instagram can be utilized to reach a wider audience.

Creating financial inclusion opportunities and possibilities

The NG leads the way in the use of digital payments. It remains as the most cash-lite sector in the country, with two in every three payments made digitally. Government payments, such as salaries, social welfare subsidies, payments to suppliers, internal revenue allotments to local government units (LGUs), are estimated to total to around ₱23–30 million in a month, with ₱14–19 million being paid digitally (Better than Cash Alliance, 2020). Various government agencies, including the Department for Social Welfare and Development (DSWD), Pag-IBIG and Social Security System (SSS), have undertaken notable efforts towards the use of digital payments for government-to-people (G2P) transfers.

To promote the adoption of digital payments in the country, the NG launched the Government e-Payments (EGov Pay) facility in November 2019. The EGov Pay is a payment solution that allows a streamlined digitalization of NG collections and disbursements. This is anticipated to lead to a more efficient government collection, better audit, and enhanced transparency. Ultimately, this will result in lesser revenue leaks. The NG continues to encourage government agencies and LGUs to be part of the EGov Pay as it envisions a more digital bureaucracy.[22]

Another initiative to increase the use of digital payments is the adoption of the National Quick Response Code Standard (QR Ph). The use of a National QR Standard has transformed the fragmented QR-driven payment services into interoperable payment solutions. This eliminated the need for the merchants and customers to maintain several accounts and for the merchants to display numerous QRs. The use of a person-to-merchant payment through the QR Ph (P2M QR Ph) is expected to advance financial inclusion in the country. This will not only benefit large enterprises but also small unbanked vendors and their customers. The facility offers a simple and affordable mode of payment. Transactions through this payment mode entails merchants printing or sending their QR Ph code and customer scanning the code using their smartphone.

In 2018, the BSP introduced basic deposit accounts (BDAs) to boost financial inclusion among Filipinos. These are no-frills account that can be opened for ₱100 or less, with no maintaining balance, no dormancy changes and simple identification requirements (e.g., Barangay certificate). Through BDAs, lower-income Filipinos or poorer households can still have their own transactions account that they can use to avail the financial services that they need.

The NG has created opportunities for greater financial inclusion in the country. Nonetheless, there may still be some areas that it could further explore. For example, while the DSWD disburses majority of the Pantawid Pamilyang Pilipino Program (4Ps) social

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[22] The agencies that are currently part of the EGov Pay facility include the Bureau of Internal Revenue, Philippine National Police, Department of Trade and Industry, OWWA, Philippine Health Insurance Corporation (PhilHealth).

transfers digitally, the cash cards given to beneficiaries are of limited use. These cash cards are mainly for withdrawing the 4Ps benefits. Converting the cash cards into full-service transaction accounts will onboard 4Ps beneficiaries to the formal financial system, thereby expanding financial inclusion and, potentially, increasing the use of DFS.

6. Concluding thoughts

Financial inclusion is an important tool in alleviating poverty and increasing economic growth. Financially included individuals have access to financial services like savings, credit, payments, and insurance which allow them to better plan their investment, borrowing, spending, and consumption as well as prepare for unforeseen events like emergencies and financial shocks. These can help improve their quality of lives and contribute to better well-being. While significant strides have been made in promoting financial inclusion in many countries, 1.7 billion adults, or almost a third of the global adult population, remain unbanked or without access to formal financial services like savings and credit.

Countries, including the Philippines, have considered ways of leveraging the widespread use of mobile phones and rapid digital innovations to promote financial inclusion. The ease of access and affordability that DFS provide have allowed millions of poor individuals and households to move from purely cash-based transactions to formal financial services.

While there is a positive relationship between the use of DFS and financial inclusion, the relationship is stronger for certain groups of households (e.g., better educated, with internet access, higher income). Thus, the potential of DFS for financial inclusion, particularly for the low-income households, may not be fully realized. Concerns have even been raised for the possibility of a digital divide that could, in turn, lead to financial exclusion instead of inclusion.

Our empirical results have shown that digital financial inclusion could lead to improve household welfare. Households that have higher demand, not only for financial services in general, but also for DFS in particular, have higher per capita income or per capita expenditure.

Some policy initiatives that could help leverage the use of DFS for financial inclusion in the Philippines include: 1) addressing digital infrastructure gaps; 2) expanding financial education and digital literacy programs; and 3) creating financial inclusion opportunities and possibilities.

A follow-up study will use the 2018 CFS and 2019 FIS datasets to explore the changes to the demand of households for DFS. It will also consider the impact of the COVID-19 pandemic on the uptake of DFS and the implications to financial inclusion in the Philippines.

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APPENDIX

Table 1. Definition and summary statistics of variables used in model estimation

Variable	Definition	No. of Observations	Mean	Standard Deviation	Minimum	Maximum
Household welfare:						
ln(pcinc)	Natural logarithm of household per capita income (pesos)	9,214	10.05	1.01	7.35	14.86
ln(pcexp)	Natural logarithm of household per capita expenditure (pesos)	15,482	10.11	0.82	3.20	15.11
Variable of interest:						
DFS	Use of DFS: 1 = used DFS; 0 = did not use DFS	15,500	0.01	0.10	0.00	1.00
Household characteristics:						
urban	Location: 1 = urban; 0 = rural	14,448	0.36	0.48	0.00	1.00
age	Age of respondent (year)	15,483	49.17	14.24	14.00	97.00
sex	Sex of respondent: 1 = male; 0 = female	15,483	0.39	0.49	0.00	1.00
partner	Marital status of respondent: 1 = with a partner; 0 = without a partner	15,503	0.76	0.43	0.00	1.00
financial status	Financial status of respondent: 1 = financially independent;[23] 0 = financially dependent[24]	15,483	0.57	0.50	0.00	1.00

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[23] A financially independent household member provides or pays for his/her own expenses in at least two of the three major expense categories: rent, food, and/or other living expenses (e.g., clothing, toiletries, transportation, among others); e.g., live-in domestic help hired by household, boarders.

[24] e.g., children of the respondent and/or his/her spouse/partner who may not live with but are dependent on the couple for financial support

Variable	Definition	No. of Observations	Mean	Standard Deviation	Minimum	Maximum
education	Highest educational attainment of respondent: 1 = no grade completed; 2 = some elementary; 3 = elementary; 4 = some high school; 5 = high school; 6 = vocational/technical; 7 = some college; 8 = college; 9 = some postgraduate; 10 = postgraduate	15,131	4.51	1.91	1.00	10.00
employed	Employment status of respondent: 1 = employed;[25] 0 = not employed[26]	15,503	0.24	0.43	0.00	1.00
dependent members	Number of dependent household members (aged 0–14 years old and at least 65 years old): 1 = less dependents; 0 = more dependents	15,503	0.85	0.35	0.00	1.00
own deposit account	Ownership of deposit account: 1 = with a deposit account; 0 = without a deposit account	15,503	0.11	0.31	0.00	1.00

[25] worked for at least an hour during the reference period
[26] either unemployed or not in the labor force during the reference period

Variable	Definition	No. of Observations	Mean	Standard Deviation	Minimum	Maximum
financial attitude	Principal Component Analysis (PCA) index on financial attitude of respondent	15,503	0.00	1.33	-7.45	4.90
own business	Ownership of business: 1 = with a business; 0 = without a business	15,503	0.18	0.38	0.00	1.00
risk attitude	Respondent's choice in risk attitude question: 1 = stick to business with permanent income; 0 = choose new business which may earn lower or higher income	15,503	0.65	0.48	0.00	1.00
time discounting	Respondent's choice in time discounting question: 1 = get prize immediately; 0 = get prize after a month	15,503	0.71	0.45	0.00	1.00
Instrument:						
internet access	Proportion of households with internet access (%)	15,503	2.17	0.80	0.00	4.14

Table 2. List of items in the CFS that are related to the use of DFS*

Section / Sub-Section Name	Variable Code/Question	Choice/Response Option	Remark(s)
C. RESPONDENT'S RESIDENCE / CA. HOUSING CHARACTERISTICS	C15. What form/s of payment was/were used in the purchase of the property?	1 Cash 2 Check 3 Credit Card 4 Bank deposit using bank-to-bank transfer 98 Others	The property refers to respondent's residence.
D. REAL PROPERTY OWNERSHIP AND LOANS TO OTHERS / DA. REAL PROPERTY OWNERSHIP	D9a-c. What was the form/s of payment used in buying this (property _)?	1 Cash 2 Check 3 Bank deposit using bank-to-bank transfer 98 Others	The property refers to other real property purchased by the household.
E. FINANCIAL ASSESTS / EB. MUTUAL FUNDS, STOCKS, BOND AND OTHER FINANCIAL ASSETS / EB4. FIXED INCOME SECURITIES	E54. What forms of payment was/were used in the purchase of these securities?	1 Cash 2 Check 3 Credit Card 4 Bank deposit using bank-to-bank transfer 98 Others	
F. VEHICLES AND OTHER NON-FINANCIAL ASSETS / FA. VEHICLES	F6a-c. What is the form/s of payment used in buying the vehicle?	1 Cash 2 Check 3 Credit Card 4 Bank deposit using bank-to-bank transfer 98 Others	
G. CREDIT CARDS AND OTHER LOANS / GA. CREDIT CARDS	G5a-a-c. What was the mode of payment?	1 Bank (over the counter) 2 Bayad center / Bills payment center 3 Pawnshops 4 Mobile banking 5 Direct cash payment (person to person, debt collector) 6 Salary Deduction 7 Internet banking 8 ATM 98 Others	The mode of payment refers to that used in paying for the total bill of each of the three most frequently used credit cards for the past month.

Section / Sub-Section Name	Variable Code/Question	Choice/Response Option	Remark(s)
G. CREDIT CARDS AND OTHER LOANS / GA. CREDIT CARDS	G10a-b. What was the mode of payment?	1 Bank (over the counter) 2 Bayad center / Bills payment center 3 Pawnshops 4 Mobile banking 5 Direct cash payment (person to person, debt collector) 6 Salary Deduction 7 Internet banking 8 ATM 98 Others	The mode of payment refers to that used in paying for the total bill of each of the other credit cards (i.e., fourth up to sixth most frequently used) for past month.
G. CREDIT CARDS AND OTHER LOANS / GB. OTHER LOANS	G28a-a-c. What was the mode of payment?	1 Bank (over the counter) 2 Bayad center / Bills payment center 3 Pawnshops 4 Mobile banking 5 Direct cash payment (person to person, debt collector) 6 Salary Deduction 7 Internet banking 8 ATM 98 Others	The mode of payment refers to that used in paying for the amortization of each of the three biggest loans of the household.
I. WORK AND INCOME / IA. DETAILS OF RESPONDENT'S EMPLOYMENT	I-32. How did you usually send these remittances?	1 Banks 2 Agency / Employer / Local office 3 Friends / Co-worker 4 Electronic Money (i.e., Smart Padala, Globe, etc.) 5 Non-bank Institutions (Western Union, Lhuillier, LBC, Aboitiz, etc.) 98 Others	If the respondent worked abroad in 2013
I. WORK AND INCOME / IB. DETAILS OF RESPONDENT'S SPOUSE / PARTNER'S EMPLOYMENT	I-66. How did you usually receive the remittance sent by your spouse/ partner?	1 Banks 2 Agency / Employer / Local office 3 Friends / Co-worker 4 Electronic Money (i.e., Smart Padala, Globe, etc.) 5 Non-bank Institutions (Western Union, Lhuillier, LBC, Aboitiz, etc.) 98 Others	If the respondent's spouse worked abroad in 2013

Section / Sub-Section Name	Variable Code/Question	Choice/Response Option	Remark(s)
K. OTHER INCOME AND EXPENDITURES / KA. INCOME FROM OTHER SOURCES	K3. In what mode is this received? 1 Vehicles 2 Household Appliances 3 Jewelry 4 Work of Art (i.e. painting) 5 Antique 6 Furniture (dining set, etc.) 98 Others	1 Cash 2 Check 3 Credit card 4 Debit card / ATM 5 Internet banking 6 Other electronic payment (GCash, Smart Money, other e-money payments) 98 Others	Mode of receipt of income from sale of assets
K. OTHER INCOME AND EXPENDITURES / KD. EXPENDITURES IN 2013	K18–K22. How do you normally pay for your expenses? K18. Food and beverage consumed at home per month in 2013? *[This includes expenses on food and drinks (including mineral water) deliveries, food items purchased in supermarket, grocery, wet market, sari-sari store or peddlers]* K19. Food and beverage consumed outside the home per month in 2013? *[This includes expenses on meals eaten in restaurants, school or place of work]* K20. Regular transportation per month in 2013? *[This includes fares for public transport, airfares, car gasoline, driver's salary etc.]* K21. Communications per month in 2013? *[This includes telephone bills, cell phone bills/prepaid card, etc.]* K22. House rent per month in 2013? *[If house is owned, get the imputed rent of house]*	1 Cash 2 Check 3 Credit card 4 Debit card / ATM 5 Internet banking 6 Other electronic payment (GCash, Smart Money, other e-money payments) 98 Others	

Section / Sub-Section Name	Variable Code/Question	Choice/Response Option	Remark(s)
K. OTHER INCOME AND EXPENDITURES / KD. EXPENDITURES IN 2013	K34–K44. How do you normally pay for your expenses? K34. Utilities such as electricity in 2013? K35. Utilities such as water in 2013? K36. Kerosene / gas in 2013? K37. Clothing in 2013? K38. Medicine and medical services in 2013? K39. Education in 2013? *[This includes tuition fee, school supplies, books, allowance, uniform and other expenses that has to do with education]* K40. Recreation such as movie tickets, concert passes, purchase of VCD/ DVD, going to the gym, spa, etc. in 2013? K41. Travel or vacation in 2013? K42. Purchase of furniture, household appliances and other equipment in 2013? K43. Housing repairs and maintenance in 2013? K44. Household help like yaya, gardener, maid, laundry woman, cook, houseboy, etc. in 2013?	1 Cash 2 Check 3 Credit card 4 Debit card / ATM 5 Internet banking 6 Other electronic payment (GCash, Smart Money, other e-money payments) 98 Others	

* Sourced from the 2014 Consumer Finance Survey's (CFS) Data Dictionary

Table 3. Estimated models on the use of DFS and on impact on household income

First-stage equation:	
Dependent variable: Use of DFS	
Independent variable	*Estimate*
urban	0.0020
	(0.0030)
age	0.0001
	(0.0001)
sex	0.0064 *
	(0.0033)
with partner	0.0051
	(0.0034)
financial status	0.0010
	(0.0030)
education	0.0025 ***
	(0.0007)
employed	-0.0020
	(0.0034)
dependent members	0.0010
	(0.0040)
own deposit account	0.0232 ***
	(0.0061)
financial attitude	-0.0013
	(0.0011)
own business	-0.0023
	(0.0035)
risk attitude	-0.0022
	(0.0032)
time discounting	0.0015
	(0.0032)
ln(internet access)	0.0060 ***
	(0.0019)
constant term	-0.0269 **
	(0.0105)

Second-stage equation:	
Dependent variable: ln (per capita income)	
Independent variable	*Estimate*
DFS	34.5492 ***
	(11.2454)
urban	0.0270
	(0.1176)
age	0.0003
	(0.0043)
sex	-0.1354
	(0.1342)
with partner	-0.2851 **
	(0.1322)
financial status	-0.0875
	(0.1080)
education	0.0591
	(0.0406)
employed	0.2236 *
	(0.1239)
dependent members	0.1340
	(0.1462)
own deposit account	-0.4496
	(0.2837)
financial attitude	0.0368
	(0.0413)
own business	0.2820 **
	(0.1276)
risk attitude	0.1138
	(0.1181)
time discounting	-0.0695
	(0.1166)
constant term	9.3578 ***
	(0.4012)

Notes: Figures in parentheses are robust standard errors;

* significant at 10% level; ** significant at 5% level; *** significant at 1% level

**Table 4. Estimated models on the use of DFS and on impact
on household expenditure**

First-stage equation:		Second-stage equation:	
Dependent variable: DFS		Dependent variable: ln (per capita expenditure)	
Independent variable	Estimate	Independent variable	Estimate
urban	0.0018 (0.0021)	DFS	38.4304 *** (10.7156)
age	0.0001 (0.0000)	urban	0.1132 (0.0912)
sex	0.0039 * (0.0022)	age	0.0030 (0.0033)
with partner	0.0058 *** (0.0022)	sex	-0.0483 (0.0939)
financial status	-0.0000 (0.0020)	with partner	-0.3837 *** (0.1066)
education	0.0022 *** (0.0005)	financial status	0.0256 (0.0804)
employed	0.0016 (0.0026)	education	0.0611 * (0.0338)
dependent members	0.0012 (0.0025)	employed	-0.0359 (0.1045)
own deposit account	0.0189 *** (0.0050)	dependent members	0.0873 (0.0993)
financial attitude	-0.0008 (0.0006)	own deposit account	-0.3949 (0.2435)
own business	0.0012 (0.0028)	financial attitude	0.0545 * (0.0285)
risk attitude	-0.0019 (0.0022)	own business	0.1506 (0.1091)
time discounting	0.0004 (0.0023)	risk attitude	0.0912 (0.0901)
ln(internet access)	0.0056 *** (0.0015)	time discounting	-0.0108 (0.0899)
constant term	-0.0266 *** (0.0075)	constant term	9.4258 *** (0.3282)

Notes: Figures in parentheses are robust standard errors;
* significant at 10% level; ** significant at 5% level; *** significant at 1% level