

1. Introduction

As elsewhere, digitalization is rapidly spreading in Vietnam—a trend accelerated by the pandemic. Vietnam has a relatively high penetration of mobile phones and internet (fixed and mobile-broadbands at 20 and 70 percent, respectively), comparable to ASEAN peers (Figure 1). Vietnam is also one of the first countries in the world to trial 5G ([Cameron et al, 2019](#)) and offers competitive cellular and broadband prices for its region, although internet speed remains relatively low (Figure 2). Further, while Vietnam lags behind peers on traditional measures of financial inclusion such as access and usage of accounts at financial institutions, it performs well on digital measures of financial inclusion such as access and usage of internet and mobile accounts (Figure 3). There are also successful e-gov achievements, including initiatives such as the national public services portal, the e-document exchange platform, and the new national financial inclusion strategy.

Notwithstanding widespread digitalization, the use of digital tools for social protection remains limited. Despite ongoing efforts, the coverage provided by Vietnam's social protection system is still incomplete, and delivery remains fragmented. Even prior to the pandemic, coverage of social protection programs was low compared to peers, partly due to a large informal workforce. In 2019, only about 35 percent of the labor force was covered by social protection (Figure 4). Classification of beneficiaries was also piecemeal, and coverage was particularly low in the existing emergency support programs ([World Bank, 2021a](#)). Furthermore, while Vietnam has well developed social programs for the very poor, there is relatively little assistance offered to other vulnerable groups, such as informal urban workers, increasing the importance of self-insurance mechanisms for such households.¹ The delivery system for providing support was also suboptimal, relying on manual, time-consuming registration and inefficient payment procedures.

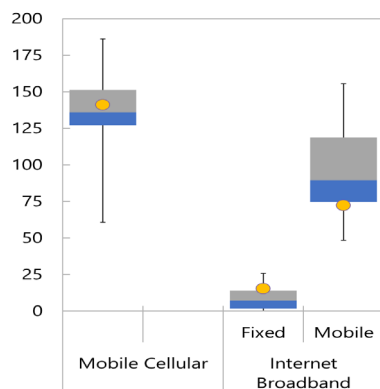
Limited use of digital tools during the pandemic affected the timeliness and effective delivery of assistance, particularly during lockdowns. According to the [World Bank \(2022b\)](#), an estimated US\$1.9 billion in aggregate household income was lost during the lockdowns in 2021Q3. Since existing vulnerable groups and social protection recipients were pre-approved to receive COVID-19 relief top-ups, the benefits from pandemic relief were received by poor households. However, because of strict criteria and the lack of data on the informal sector that could be verified or cross-checked against social insurance or other databases, expansion of the safety net to reach new beneficiaries was much smaller in scale than in regional peers. As a result, millions of workers working on an informal basis were left out of existing safety nets. Understanding the extent of this issue and how digital tools can be used to improve the coverage of social protection programs is therefore extremely relevant for policymaking. In addition, Vietnam is an ideal case study, as it has limited social protection coverage, but has high levels of digital access.

This paper presents macro and micro evidence on how digitalization can help improve the functioning of social protection systems in Vietnam. Drawing on cross-country experiences with digital tools to enhance social protection, we first provide a comparison with the state of play in Vietnam. [Gelb and Mukherjee \(2020\)](#) illustrate how the use of digital technology can help along the two broad stages of the “social assistance value chain”: identification and delivery. Cross-country experiences suggest that variety of digital tool can be used to both identify and authenticate individuals, helping governments improve targeting and coverage of social programs by reducing leakage and non-take-up problems ([IMF, 2018](#); [IMF, 2020](#)). Once eligible beneficiaries are identified

¹ See [Townsend \(1995\)](#) and [Dercon \(2002\)](#) for a discussion of self-insurance in developing countries.

and authenticated, digital payments (including mobile money) can allow quick rollout of government transfers, especially in countries with limited access to traditional financial services and/or high levels of informality. Second, using household data for Vietnam, we examine potential distributional implications of the Covid-19 pandemic and provide policy counterfactuals.

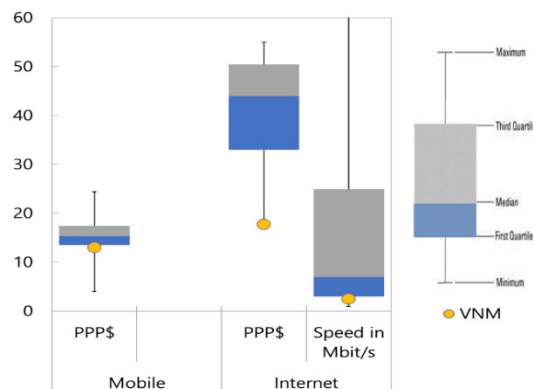
Fig 1: Mobile and Internet Subscriptions
(per 100 inhabitants, VNM vs ASEAN, 2019)



Source: Calculations based on [ITU](#).

Note: Subscriptions per 100 inhabitants. The box plot represents ASEAN.

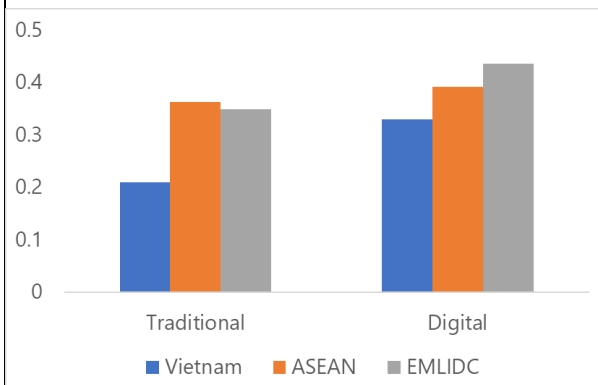
Fig 2: Mobile and Internet Prices
(VNM vs ASEAN, 2019)



Source: Calculations based on [ITU](#).

Note: Mobile cellular prices are for a low usage basket (70 min and 20 SMS; in PPP\$). Internet prices are residential monthly subscriptions for fixed-broadband internet (5GB; in PPP\$). The box plot represents ASEAN.

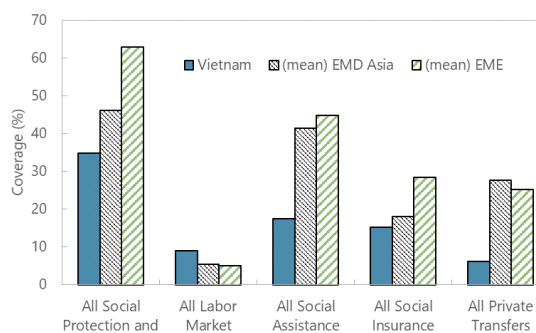
Fig 3: Financial Inclusion Indices
(0-1 index, higher is better, 2017)



Source: Calculations based on [Sahay et al \(2020\)](#).

Note: Indices combine indicators of access to and usage of traditional and digital payments services, such as ATM and bank branches, mobile and internet access, account holding, and usage of financial institutions/mobile account for wage and utility payments. Country groups are simple averages.

Fig 4: Coverage, Social Protection and Labor
(most recent available year)



Source: IMF FAD Social Protection & Labor Assessment Tool (SPL-AT) and World Bank [ASPIRE](#).

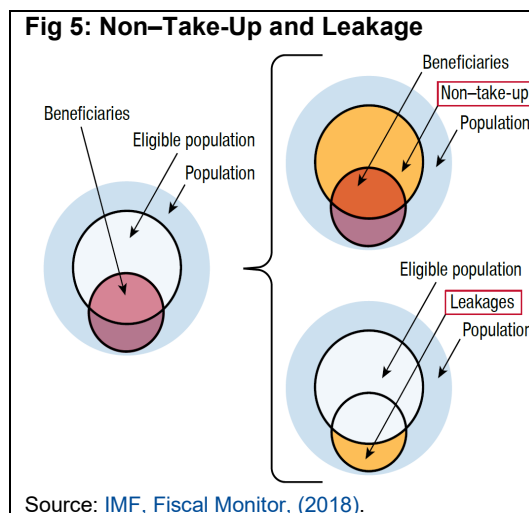
Note: Labor market (wage subsidies and unemployment benefits); Social assistance (non-contributory cash and in-kind transfers); Social insurance (contributory pensions and health); Private transfers (remittances).

Evidence using household data shows that implementing digital payments could have significantly cushioned the impact of Covid-19 in Vietnam. Using detailed household data from the 2018 vintage of the Vietnam Household Living Standards Survey (VHLSS), we simulate the potential gains from expanding the coverage of social protection through digital payments. Following [De Stefani et al. \(2022\)](#), we model the Covid-19 recession as an exogenous income shock that primarily affects workers in the service sector. Under this assumption, we can construct counterfactual income distributions, including under the current unemployment insurance benefit scheme in Vietnam, and under a potential system that provides benefits to informal workers via digital payments. Our baseline result suggests that implementing a digital payments system that reached informal workers could have reduced the average household income loss by half. While our analysis rests on rather strong assumptions, we note that the attempt is not to quantify the impact of the Covid recession (see, for e.g., [Morgan and Long, 2021](#)). Instead, our goal is to estimate the income distribution under different social protection programs and to highlight how digitalization could be an important policy tool to protect vulnerable populations against income shocks.²

The rest of this paper is structured as follows. Sections 2 and 3 discuss cross-country experiences on how digital tools can help with identifying and reaching eligible beneficiaries, respectively. Section 4 uses detailed Vietnamese household data to simulate the welfare gains of expanding the coverage of unemployment insurance to informal workers. Section 5 discusses how to manage potential risks from digitalization. Section 6 concludes.

2. Identifying Beneficiaries: Cross-Country Considerations

Governments often face leakages and take-up challenges in social protection (Figure 5 and [IMF 2018](#)). In addition, these trade-offs can be particularly pronounced in countries with large informal sectors. On the one hand, governments may adopt tight eligibility criteria to ensure that no “undeserving” beneficiary receives support, running the risk of excluding some eligible individuals (exclusion errors), leading to *non-take-up*. On the other hand, a wide net could be cast so that most of the poor are reached, which risks the inclusion of “undeserving” cases among the beneficiaries (inclusion errors), leading to *leakage*. This is often the case when social administrations find it difficult to identify and/or locate beneficiaries (“ghost” beneficiaries), or fully verify whether the program’s eligibility criteria are met (for example, socioeconomic characteristics of beneficiaries). Both types of errors threaten the efficiency of social insurance and public service provision ([IMF, 2018](#)).



Cross-linking and cross-checking of databases can facilitate identifying and verifying eligible beneficiaries. While identification alone does not include the details needed for program targeting, it can link an individual to

² It should be noted that the data used in this paper was collected before the Covid-19 pandemic, as datasets that contain data from the worst sections of the pandemic in Vietnam are not yet available.

information stored in other databases. Thus, many countries have used unique identifiers to cross-link databases, both pre-Covid and during the pandemic. For workers in the formal sector, available social security and tax administration databases could be electronically linked to identify and verify beneficiaries. Pakistan and Thailand are an example, having cross-checked their national IDs against the social benefit system and the revenue department database, respectively, to determine eligible beneficiaries ([World Bank, 2018a; 2018b](#)).

Coverage of the Vietnam Social Security (VSS) is mixed. Social protection in Vietnam includes social insurance (pension) schemes (mandatory for employees with contract over 1 month and voluntary for others) and unemployment insurance (compulsory for workers with contract above 3 months); a health insurance system that fully subsidizes the premium for the poorest and children under 6, and offers partial subsidies for other categories; social assistance (cash transfer) programs (regular benefits and emergency relief); and a large number of programs targeted to specific vulnerable groups, areas and sectors. Health coverage (near universal) is higher than pensions (33 percent) and unemployment insurance (27 percent). The absence of a unique identifier for eligible beneficiaries complicates the cross-linking of programs even within the VSS ([World Bank, 2015](#)), despite the country being on the cusp of a significant ageing of the population ([World Bank, 2022a](#)). High coverage in the health fund implies that identifying vulnerable households in the informal sector may not be the problem. Instead, low benefits or high costs of joining pensions/unemployment funds could be at the heart of the issue. One solution could be to introduce mandatory social contribution payments by independent workers, as Cape Verde, Colombia, and the Philippines have done to expand pension coverage in the informal sector ([ILO, 2013](#)).

Country experiences suggest that automated processes can cross-link and cross-check databases even in the informal sector. This includes: (i) beneficiaries of social security sub-systems;³ (ii) beneficiaries of public utilities' "social tariffs" or subsidized tariffs (electricity, gas, water); (iii) databases of students attending schools and/or health service beneficiaries in low-income areas; (iv) data on the informal sector collected by local government entities and NGOs, and (v) data from the voter/election registration databases.⁴

The cross-linking of databases in Vietnam is hampered by limited data sharing across agencies. Despite several individually comprehensive government databases, data is frequently stored and used only within the organization that collects it. For instance, [Handayani et al \(2017\)](#) reports that over 1.3 million duplicate health insurance cards had been issued in Vietnam in 2012-13, partly due to the lack of integration between provincial and district offices and the absence of a nationally standardized user identifier system. Limited data sharing has been an impediment to speedy disbursement of cash transfers during the pandemic. In 2020, only 30 percent of the announced cash transfers in response to Covid-19 were eventually disbursed, suggesting problems with both identifying and reaching eligible beneficiaries ([IMF, 2021](#)).

Several countries have adopted digital and biometric IDs. Digital IDs are in principle universal, and thus cover both formal and informal workers.⁵ Biometric IDs can both identify and authenticate individuals, helping

³ For example, Colombia uses electronic platforms for independent workers to establish and pay contributions to social security and cross-references such information in its sub-systems of health, pensions and professional hazards.

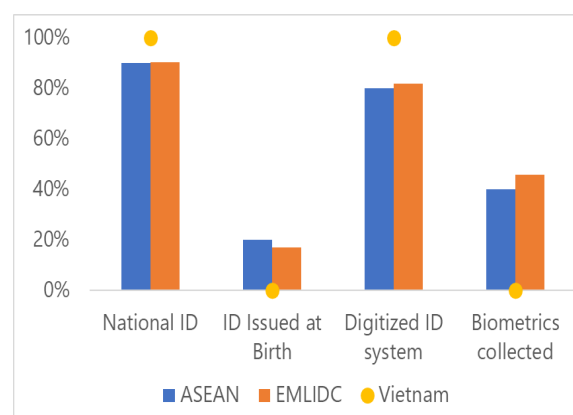
⁴ Self-enrollment could also be encouraged, using simple webpage/mobile app or even a call center, within an extensive public awareness campaign. The beneficiary enrolment process should be smooth with clear communication about the prerequisites.

⁵ Establishing legal identity for all, including through birth registration, by 2030 is target 16.9 of the SDGs.

governments improve targeting and coverage of social programs, remove duplicate records, and reduce leakage and non-take-up problems (Gelb and Clark, 2013; Muralidharan et al, 2016; World Bank, 2018b).⁶ As of end-2018, World Bank data suggests that 175 of 196 surveyed countries had some type of national ID system. Of these, most were digitized and around half collected biometric features for issuing a digitized ID. Vietnam currently has a (partial) digital ID, but no biometrics collected (Figure 6). Gelb and Metz (2018) estimate that a developing country would need to spend 0.6 percent of GDP to establish a national biometric identification system (or about \$4-11 per registrant for enrollment and credential issuance), with maintenance costs of 0.1 percent of GDP annually. Similarly, Gelb and Decker (2011) and Gelb and Clark (2013) estimate the cost at around \$5 per person. India's biometric identification system, Aadhaar, is a pioneer in this area with more than 1.2 billion registered citizens. India's government initiative JAM (Jan Dhan-Aadhaar-Mobile) links Jan Dhan accounts, biometric digital ID Aadhaar cards and the mobile network as a service delivery platform. Evidence from India shows that digitalization can reduce intermediaries and leakages and improve targeting and delivery of public services (D'Silva et al, 2019; Gelb and Metz, 2018; World Bank, 2018b; Handayani, et al 2017). Similarly, by requiring biometric registration, South Africa eliminated 850,000 ghost and ineligible public-program beneficiaries in 2014 and halved administrative costs (IMF, 2018).

Fig 6: Digital/Biometric IDs

(VNM vs peers, percent of countries, 2018)



Source: Calculations based on WB ID4D Global Dataset.

Note: Country groups are simple averages.

Digitalization can save fiscal resources.⁷ While specific estimates of cost reductions due to digitalized identification processes vary, estimates suggest that moving to electronic Know-Your-Customer (e-KYC) reduces the average cost of verifying customers from \$15 to \$0.50 (World Bank, 2018b). In the case of India, GSMA (2017) reports that Aadhaar-enabled e-KYC reduced the cost of KYC process from Rs 40 (\$0.60) per customer to Rs 5 (\$0.07). As of 2018, the Government of India reported estimated fiscal gains of more than \$12 bn since 2013 from Aadhaar-enabled direct benefit transfers and related reforms, around nine times the cost of reform implementation (World Bank, 2018b).

Ongoing efforts to issue full digital IDs in Vietnam are key for successful e-gov operations. As of 2020, a partially digitized foundational ID system exists in Vietnam.⁸ By comparison, half of the ASEAN member countries had fully digitized ID systems, most of which used smartcards and biometrics (World Bank, 2019). While Vietnam's national ID is near universal, an electronic unique authentication is not yet available. In an effort to contribute to building the national population database, the Ministry of Public Security has started issuing chip-based ID cards to replace existing paper-based national IDs for more than 50 million citizens since July 1st, 2021. It will also

⁶ Though biometrics are often discussed in conjunction with digital ID systems, they are not synonymous. One of the world's most successful digital ID systems, Estonia's eID, does not use biometrics, but instead employs a chip card (also called a smart card) and a personal identification number (PIN). Most new digital ID systems, however, are increasingly using biometrics (Gelb and Metz 2018; GSMA 2019a).

⁷ See IMF (2018) for more country case studies on fiscal savings from digitalization.

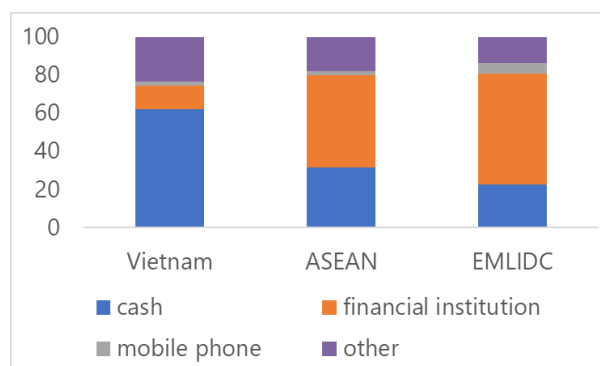
⁸ Currently, Vietnamese citizens are using either paper-based 9 or 12-digit ID cards, or (as of 2016) ID cards with a 2D barcode (only available in 16 cities and provinces nationwide). Vietnam had previously long operated a household registration (ho khau) system, with details included in a family book (Gelb and Metz 2018).

include information on biometric identifiers (fingerprints)⁹, taxes, and health insurance, among others. At this stage, the proposed digital ID scheme is to enable e-transactions with government agencies only.

3. Reaching Beneficiaries: Cross-Country Experiences

Several governments were already making digital payments and transfers to households (G2P) and businesses (G2B) pre-pandemic. G2P payments include payments (or transfers) of tax refunds, subsidies, social programs, salary, stipends, pensions, scholarships, and emergency assistance. Notable examples of digitized G2P payments include Brazil's Bolsa Familia, a conditional cash transfer program established in 2003 that provides low-income families with monthly transfers via smart cards ([Gelb et al, 2020](#)); Iran's direct cash electronic transfers to compensate vulnerable households during fuel subsidy reforms in 2010 ([Gelb and Decker, 2011](#)); and Sierra Leone's digital payments to response workers during the 2014-15 Ebola crisis ([Bangura, 2016](#)). Routing G2P transfers through bank or mobile accounts, in turn, encourage greater financial inclusion ([Gelb et al, 2020](#); [Prady, 2020](#); [D'Silva et al, 2019](#)). For example, Chile and Peru are making payments through state-owned banks ([Una et al, 2020](#)), with the advantage of digital ID systems not only allowing unique identification, but also quick and direct deposits to beneficiaries' ID-linked bank accounts.¹⁰ Namibia and South Africa have been using biometric smart cards to disburse social pensions through mobile and fixed ATMs ([Devereux and Vincent, 2010](#)). Payments to businesses from the government (G2B) have also been increasingly disbursed using digital methods in many countries. In Peru, for instance, 59 percent of subnational government G2B procurement payments were made via checks and 41 percent via electronic transfers before the pandemic ([Agur et al, 2020](#)). In Vietnam, government transfer payments are predominately done in cash, compared to ASEAN and EMLIDC peers (Figure 7).

Fig 7: G2P (Government Transfer Payments)
(share of payment method, in percent, age +15, 2017)



Source: Calculations based on [WB FINDEX](#) database.

Note: Government transfers include payments for educational or medical expenses, unemployment benefits, subsidy payments, or any kind of social benefits. It does not include pensions or public sector wages. Country groups are simple averages.

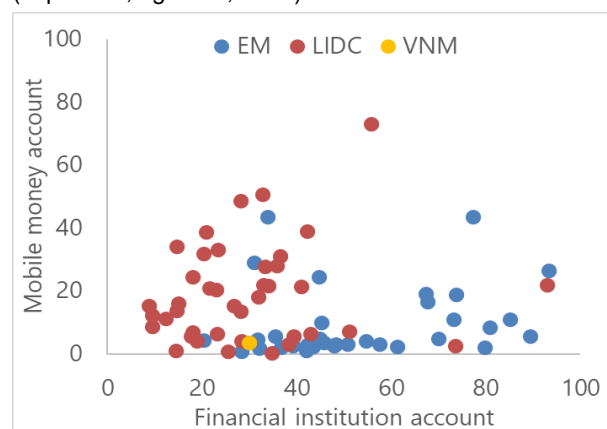
Mobile money can be a cost-effective alternative, especially in countries with limited penetration of traditional financial services. Mobile money accounts are particularly prevalent in LIDCs in Sub-Saharan Africa ([IMF 2020](#); [GSMA 2019a](#)), which also happen to have lower penetration of traditional financial services (Figure 8). [Lund et al \(2017\)](#) estimate that digitalizing government payments could save the equivalent of 1 percent of GDP per year. The cost of mobile payments is often lower than other disbursements methods, including because of larger number of access points and wider reach in rural areas ([Bazarbash et al, 2020](#); [World Bank, 2016](#)). In ASEAN countries, per 100,000 adults in 2019, there were 282 mobile money outlets compared to only 48 ATMs and 24

⁹ In 2005, Vietnam had a successful, albeit limited, experience with using biometrics (fingerprints) to verify identities in a cholera vaccine trial, with volunteers from Son La, Vietnam ([Gelb and Clark 2013](#)).

¹⁰ See [World Bank's G2PX](#) initiative and the [IMF Financial Access Covid-19 Policy Tracker](#) for additional examples.

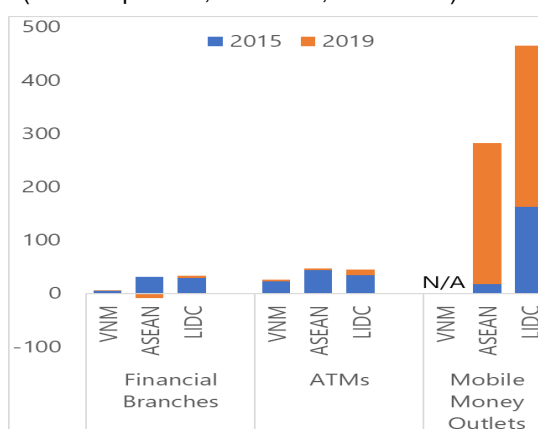
banks (Figure 9). M-Pesa—common in African countries—is an SMS-based system which enables money transfers through mobile phones. It started as P2P payments, then institutional payments (such as salaries and utility bills) were introduced, then G2P cash transfers were used including in the context of Covid-19 ([Gentilini et al., 2020](#)). Agents, located throughout the country, act as a (mobile) ATM where one can deposit or withdraw cash conveniently.

Fig 8: Mobile Money vs Financial Institutions Accounts
(in percent, age +15, 2017)



Source: Calculations based on [WB FINDEX](#) database.
Note: Country groups are simple averages.

Fig 9: Mobile Money Outlets vs Financial Branches and ATMs
(Number per 100,000 adults, 2015-2019)



Source: Calculations based on [IMF FAS](#) database.
Note: Financial branches include commercial banks, credit unions, microfinance institutions and other deposit takers. Country groups are simple averages.

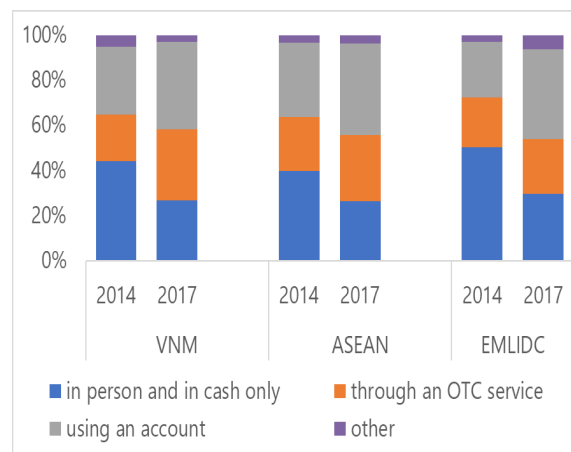
G2P mobile transfers allow for a quick rollout of government transfers, especially in the context of the Covid-19 ([Gentilini et al., 2020](#); [World Bank 2016](#)). Mobile networks can achieve multiple objectives, including to disseminate crucial information, collect household data to better target support, and provide a platform to deliver G2P payments. For instance, in response to the pandemic, Togo launched the cashless transfer program [Novissi](#), where G2P transfers are made through mobile money targeting informal workers impacted by lockdowns. Further applications include a top-up for female recipients, and other digital payments such as utility bills. In Brazil and Peru, informal workers received support via mobile money accounts. This promotes financial inclusion (by reaching the unbanked) and efficient government operations (by reducing leakages), in addition to improving the response time (by quickly and automatically reaching beneficiaries in case of shocks).

“Mobile G2P” programs follow certain steps. First, the government selects one or multiple mobile money operators (MMOs) such as mobile network operators (MNOs), commercial banks, or fintech firms. MMO’s need to have high quality of service, wide coverage, especially in harder-to-reach rural areas. Second, the government identifies eligible recipients and wires the money to the bank(s) partnering with the MMOs. Third, banks authenticate beneficiaries through KYC or e-KYC processes and convert these funds into mobile money. Beneficiaries then receive the funds via mobile wallets (mobile apps or access codes via SMS). Here, it is important to ensure branches and ATM efficacy, customer trust and risk management, including in KYC requirements. Finally, mobile wallet owners can cash-out the money, typically through MMOs access points or other partnering local (mobile) agents.

The engagement of other public and private actors can further encourage the adoption and use of mobile money, across government (G), people (P), and businesses (B). For example, beneficiaries can use the funds they received from the government through MMOs to digitally send money to each other or receive remittances (P2P; Figure 10), purchase goods and services at merchants who accept mobile money (P2B; Figure 11), and/or digitally pay utility or other bills (P2G; Figure 12). Data suggests that digital payment methods are gaining traction in Vietnam, although it is still more dependent on cash than in ASEAN and EMLIDC peers (Figures 10-12). Larger availability and affordability of such digital services would set the stage for longer term benefits from mobile money.

Fig 10: P2P Payments

(Sent or received domestic remittances, % of senders and recipients, age +15, 2014-2017)

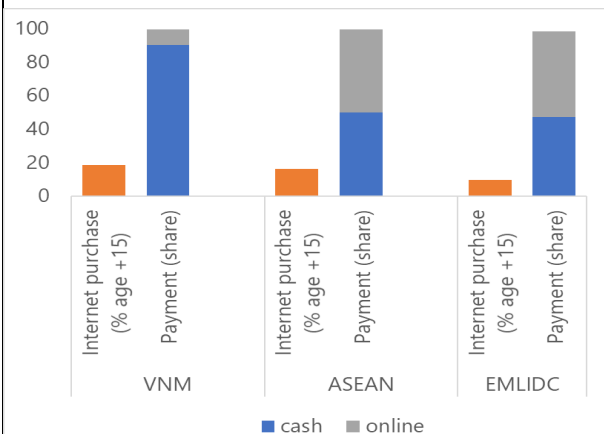


Source: Calculations based on [WB FINDEX](#) database

Note: OTC is over-the-counter services (in a bank branch, a mobile banking agent, or a money transfer service). Country groups are simple averages.

Fig 11: P2B Payments

(Internet online purchases, age +15, 2017)

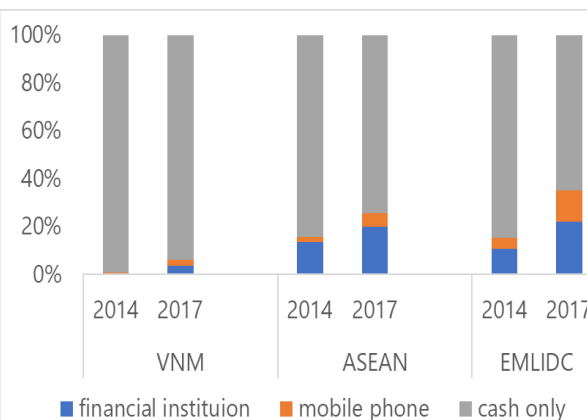


Source: Calculations based on [WB FINDEX](#) database

Note: First bar is share of population who used the internet to make online purchases. Second bar is the share of method of such payments; cash-on-delivery or online payment. Country groups are simple averages.

Fig 12: P2G Payments

(Paid utility bills, methods of payment, 2017)

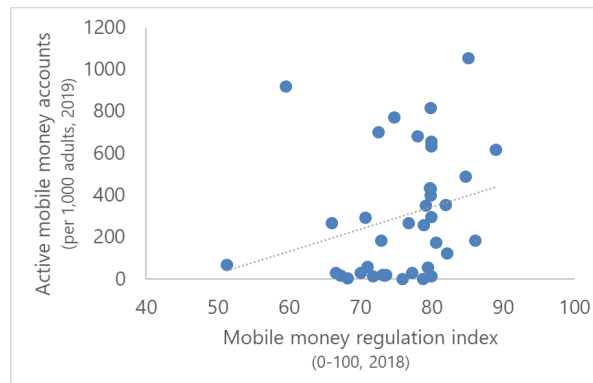


Source: Calculations based on [WB FINDEX](#) database

Note: Country groups are simple averages.

Regulation has a material impact on the adoption of mobile money. There is a positive relationship between the number of active mobile money accounts and the [GSMA \(2019b\)](#) mobile money regulatory index, a cross-country index computed for 81 countries and based on six broad enabling dimensions: authorization, consumer protection, transaction limits, KYC requirements, agent networks, and investment and infrastructure environment (Figure 13). This suggests that collaboration between the government and MMOs is essential for the success of G2P mobile payments. Non-bank fintech companies, if adequately regulated, can accelerate mobile G2P programs. For example, tech companies such as GCash, Wave Money, and GrabPay have each facilitated G2P programs in the Philippines, Myanmar, and Malaysia, respectively ([Davidovic et al, 2020](#)).

Fig 13: Regulation and Mobile Money Adoption
(in EMLIDCs)



Source: [GSMA \(2019b\)](#) and [IMF FAS](#) database.

Vietnam is piloting mobile money. The PM 2021 Decision 316-TTg approved a nationwide pilot for mobile money, prioritizing rural and remote areas. The pilot runs for 2 years, allowing cash deposits/withdrawals into mobile money accounts, linked to customers' financial institutions or e-wallets, as well as sending/receiving domestic remittances and payments for goods and services, with transaction limits at VND 10 mn (around \$430) per month. Mobile money service providers (telecommunication companies and enterprises with licensed e-wallet services) can open mobile money accounts via e-KYC, which the MoF and SBV are tasked with developing, according to PM 2020 Decision 2289/QD-TTg. Implementation decrees would need to follow with concrete steps.

4. Simulating the Welfare Gains of Digital Social Protection for Households During Covid-19

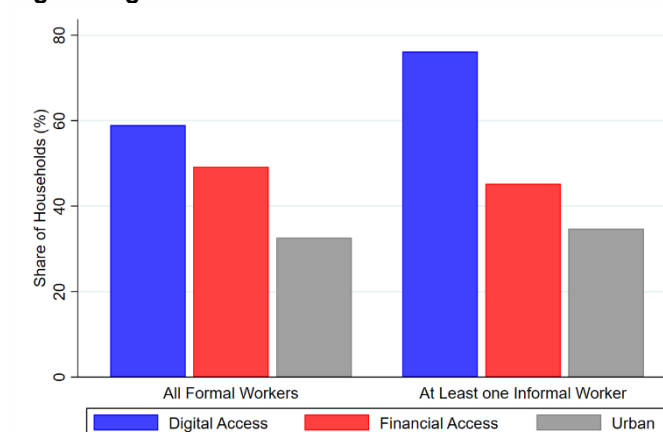
Digital payments can increase the coverage of social safety nets by reaching workers that are not registered in traditional social security programs. The need for increasing the coverage of social protection networks was made clear by the Covid-19 pandemic and the ensuing recession, where millions of workers either lost their jobs or saw their incomes severely reduced. For formal workers, unemployment insurance in Vietnam acted as one of the main stabilizers, temporarily providing them with 60 percent of their lost wages ([IMF, 2021](#); [World Bank, 2021b](#)). However, informal workers, who represent more than half of the workforce in Vietnam ([Dabla-Norris et al, 2020](#)), do not have access to such insurance and were thus largely ineligible for government assistance.

To illustrate the potential benefits from expanding social protection using digital payments, we first analyze the extent to which workers that are not covered by traditional social protection could potentially have access to digital payments. To do that, we use data from the 2018 vintage of the VHLSS, a nationally representative survey of households that is regularly conducted in Vietnam (see annex for details). Our data confirms that informality in Vietnam is pervasive: approximately 53 percent of households have at least one member that is an informal

worker.¹¹ It is also an important share of the labor force across sectors, representing about 30 percent of workers in the service sector, and even higher shares in industry and agriculture.

Among households with informal workers, about 55 percent do not have access to financial services (bank accounts, credits cards, among others; see annex), while 28 percent are not eligible to receive social security payment because all members are informal workers. However, given how pervasive informal jobs are, many informal workers live in urban areas and are likely to have digital access, proxied by internet usage. In fact, 76 percent of households with at least one informal worker claim to have accessed the internet in the month preceding the VHLSS data collection (Figure 14). These numbers are encouraging for the implementation of a system of digital payments by the government.

Fig 14: Digital and Financial Access in Vietnam



Source: Calculations based on the VHLSS 2018.

Using the 2018 VHLSS as a benchmark, we simulate the potential gains from expanding the coverage of social protection through digital payments during the Covid pandemic. Following [De Stefani et al. \(2022\)](#), we model the Covid-19 recession as an exogenous income shock that primarily affects workers in the service sector, as service jobs were much more likely to be disrupted by social distancing restrictions. Specifically, we assume that non-service workers' incomes are not affected by the Covid shock, but workers in the service sector lose a portion of their income. This results in a shock that causes households' incomes to decline by a factor directly proportional to the share of working members employed in retail, restaurants, logistics, or the hospitality sectors. Under these assumptions, the income of household h is:

$$y_h(\varepsilon) = y_h(0) \times [1 - s_h^i \varepsilon - (1 - \theta) s_h^f \varepsilon]$$

where $y_h(0)$ is household h 's pre-Covid income (see annex for details on measuring income in the data), s_h^i is the share of workers with informal jobs in the service sector, s_h^f is the share of workers with formal jobs in the service sector, θ is the share of income that workers receive from unemployment benefits (equal to 0.6 in Vietnam's case), and ε is the size of the income shock. The size of the shock can either be interpreted as the share of income lost during the pandemic or as the amount of time (as a share of the year) during which a worker received no income. We simulate three different scenarios with $\varepsilon \in \{0.25, 0.5, 1\}$ to test for different severities of the recession.

Next, we construct the income buffer stemming from higher (digital) social coverage. Our counterfactual exercise consists of expanding social protection (UI benefits) to all informal workers that have digital access (proxied by

¹¹ Informal workers are defined as those who do not have a labor contract *and* no access to social insurance. If this information is missing, we also classify self-employed workers whose primary job is in a household business as informal. To calculate the share of informal workers in a household, we only consider those able to work, i.e., we exclude any member that marks "young/studying", "retired", or "sick" as the reason for not working.

access to the internet; see annex for details), for example through digital payments. Under those conditions, the counterfactual income of household h becomes:

$$y_h^{digital}(\varepsilon) = y_h(0) \times [1 - (1 - d_h\theta)s_h^i\varepsilon - (1 - \theta)s_h^f\varepsilon]$$

where d_h indicates whether household h has access to the internet. As evidenced by the equation above, the gains from expanding coverage through the digitalization of social security nets crucially depend on the current coverage (i.e., share of informal workers) and on digital access of the population that is currently not covered.

We compute the income distributions under four different scenarios:

- 1) Pre-Covid (data).
- 2) Covid shock and no transfers.
- 3) Covid shock and existing transfers (unemployment insurance (UI) only to formal workers).
- 4) Covid shock and digital payments (UI payments to informal workers with digital access).

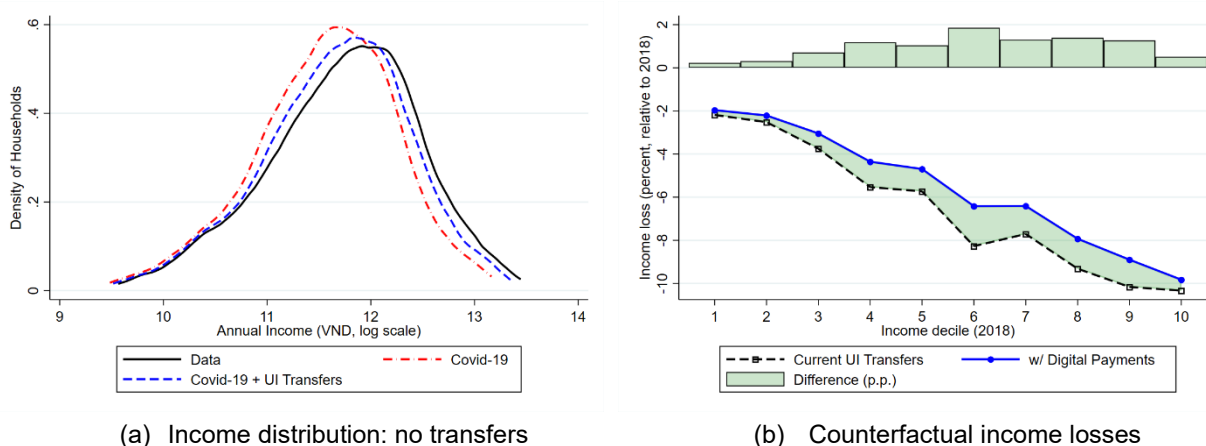
Each of these cases is shown in Figure 15. Panel (a) plots the income distribution before and after the pandemic, showcasing the shift in the income distribution caused by Covid. Note that the Covid shock affects the income of households across the entire distribution, shifting it to the left and compressing it around a smaller mean. Curiously, the least affected households are those at the bottom of the distribution, as those are overwhelmingly more likely to be employed in agriculture. This results directly from the assumption that the Covid shock affects only workers in services, although it does match the fact that the pandemic had a much milder impact on workers in agriculture, relative to urban/service workers. We also see in panel (a) that the UI transfers are able to undo a large portion of the effect of the Covid shock on income, even though a significant difference relative to the initial income distribution remains.

Panel (b) shows the average income lost in each decile of the distribution under different social insurance regimes: current UI benefits and its expansion using digital UI payments. Average losses are shown in absolute values and calculated as a percentage of households' income in 2018. Again, we find that higher income losses occur at the top of the distribution, where workers are more likely to be employed in the service sector. However, comparing income losses under the current UI regime and a UI regime with digital payments, we find that the greatest beneficiaries of such a policy are in the middle of the distribution. This is intuitive: households in the top of the income distribution are less likely to be informal workers, and thus already benefit from the current UI system. Households at the bottom of the distribution are less likely have digital access (see below), and thus cannot receive digital payments. This leaves the urban middle class, where both informality *and* digital access are pervasive, as those who benefit the most from digital payments in the UI system.

Table 1: Average income loss (percent, relative to 2018 baseline)

	$\varepsilon = 0.25$	$\varepsilon = 0.5$	$\varepsilon = 1$
No transfers	-9.3	-18.7	-37.4
UI transfers	-4.3	-8.6	-17.2
Digital payments	-3.8	-7.6	-15.2

Source: Calculations based on VHLSS 2018.

Fig 15: Income Distribution and Losses Under Counterfactual Scenarios, $\varepsilon = 0.5$ 

Note: distribution truncated at top and bottom 1% for plotting.

Source: Calculations based on VHLSS 2018.

Looking at the overall gains from the implementation of each social insurance scheme, we find that digital payments could have significantly reduced the average income loss incurred by households *relative to the existing UI regime* (see Table 1). Our results also suggest that the benefits increase with the duration or intensity of the Covid crisis: for $\varepsilon = 0.25$, the average household “gains” 0.5 percent of the 2018 annual income, while with $\varepsilon = 1$ this number increase to 2 percent (although the overall loss is much bigger). Those gains are again concentrated in urban middle-class households, who are likely to have both digital access and informal workers.

We end this section with a word of caution about our estimates. First, we note that the assumptions made to construct the Covid income shock are very strong. The size of the income shock we impose on service sector workers is arbitrary, while other workers are assumed to be completely unaffected by the pandemic. In addition, service sector workers may have not lost the entirety of their income during 2020, and workers in other sectors were affected as well, either directly or through general equilibrium effects. Our exercise also implicitly assumes that all informal workers were eligible for social assistance during the pandemic. During the acute phase of pandemic when strict lockdowns were in place, informal workers (particularly those in the service sector) were most likely to be unemployed, so this difference was arguably of second-order importance. However, a typical social protection program also requires that authorities are able to validate employment status and verify any additional conditions for eligibility (see section 2). Given all these caveats, our estimation results should be interpreted with caution. Nevertheless, we believe they remain useful to shed light on the size and distribution of the potential gains from the adoption of digital payments to expand the social insurance network.

Digital Access and Inequality

While digitalization could increase inclusion in the long-run, there is a risk of exacerbating inequality in the short-term if households in the very bottom of the income distribution are not be able to enjoy immediate benefits (e.g., because of lack of digital access). To examine this, we again use the VHLSS data to assess the correlation between digital access and various household characteristics. We do this by estimating a linear probability model,

$$I\{\text{digital access}_h\} = \beta X_h + \delta_{m(h)} + \delta_{p(h)} + \varepsilon_h,$$

where $I\{\text{digital access}_h\}$ is an indicator that equals 1 when if at least one member of household h has used the internet in the month preceding the survey (our measure of digital access). As explanatory variables, X_h , we

include household income, highest education attained by a member of the household, urban/rural status, family size, gender of the household head, the share of members of the household that are informal workers, as well as the share of members that work on industry and that work in the services sector. Finally, we also include fixed effects for the month when the survey was conducted with household h , $\delta_{m(h)}$, and for the province where the household is located, $\delta_{p(h)}$, which account for seasonal and geographic differences across households.

The coefficients are estimated via OLS and the results are shown in columns (1) and (2) of Table 2. We find that income and education have the largest (positive) impact on digital access. Households located in urban areas, with female heads, and with a higher share of informal workers seem to also have higher digital access (column 1), but these effects disappear (and even reverse) when the sector in which household members work is included (column 2). Those findings suggest that low income, poorly educated households, whose earnings rely mostly on agricultural activity, are still mostly excluded from the potential benefits of digitalization. This notwithstanding, evidence shows that increased access to mobile technology, when coupled with financial transfers, can improve outcomes for households (Gelb et al., 2020). Another option to tackle the digital divide is to make a non-digital option available to households.

Table 2: Digital and Financial Access for Households in Vietnam

	Digital Access (1)	Digital Access (2)	Financial Access (3)	Financial Access (4)
log(Income)	0.211*** (0.010)	0.176*** (0.011)	0.204*** (0.012)	0.165*** (0.012)
Education (HH head)				
Secondary	0.245*** (0.019)	0.232*** (0.019)	0.083*** (0.017)	0.068*** (0.017)
College+	0.317*** (0.023)	0.264*** (0.024)	0.262*** (0.024)	0.222*** (0.025)
Urban	0.030** (0.014)	0.024* (0.014)	0.097*** (0.017)	0.075*** (0.017)
Family Size	0.029*** (0.005)	0.028*** (0.005)	-0.029*** (0.005)	-0.019*** (0.005)
Female HH head	0.035** (0.014)	0.023* (0.014)	0.048*** (0.015)	0.048*** (0.015)
Share Informal	0.061*** (0.018)	-0.064*** (0.022)	-0.218*** (0.019)	-0.358*** (0.022)
Share Service		0.205*** (0.026)		0.259*** (0.027)
Share Industry		0.181*** (0.030)		0.339*** (0.028)
Digital Access			0.196*** (0.018)	0.167*** (0.018)
Observations	4,663	4,476	4,663	4,476
R-squared	0.379	0.368	0.408	0.431

Robust standard errors in parentheses. All specifications include province and survey month fixed effects.

*** p<0.01, ** p<0.05, * p<0.1

Notes: Digital access indicates whether at least one member of the household has used the internet in the month preceding the survey, and 0 otherwise. Financial access indicates that at least one member of the household uses any of the following financial services: ATM card, bank account, savings account, credit card, life or other insurance, or owns securities.

Source: Calculations based on the 2018 vintage of the Vietnam Household Living Standard Survey (VHLSS).

The expansion of digital payment services can also widen inequalities in the presence of financial exclusion, as households cannot benefit from these services if they lack ways to make or receive payments. In fact, many of the same characteristics associated with the lack of digital access are also associated with lack of financial access in Vietnam. This can be seen in columns (3) and (4) of Table 2, which show the coefficients obtained by estimating a similar model as the one above, but that replaces the left-hand side variable by an indicator of financial access (see annex for details). Note, however, that it is possible that an increase in digital access might alleviate issues of financial exclusion, for example through the use mobile money, as is currently being considered in Vietnam.

5. Conclusion

Drawing on cross-country evidence and using Vietnam as a case study, this paper shows that digitalization can help with identification and delivery of social protection programs. Country experiences suggest that automated processes can cross-link and cross-check relevant databases. Digital IDs can identify and authenticate individuals, helping governments improve targeting and coverage of social programs. Digital payments, including mobile money, can then allow for a quick rollout of government transfers, especially in countries with limited penetration of traditional financial services and/or high levels of informality. Using detailed household data from the 2018 vintage of the VHLSS, we find evidence that implementing digital payments could have cushioned the Covid-19 income shock in Vietnam, especially among the urban middle-class.

The country is advancing on individual pieces of the digitalization puzzle, including full digital IDs and mobile money. Progress is being made to issue fully digitized foundational IDs with biometric features, to replace existing, largely paper-based, ID cards. Vietnam is also piloting a nationwide mobile money project, including procedures to facilitate e-KYC, to facilitate digital payments and better reach rural and unbanked populations.

The next step will be to put the pieces together. For example, once digital/biometric IDs are fully rolled-out, it would be useful to expand on their use beyond government agencies and cross-link them with existing socioeconomic databases. For social protection purposes, a unified and comprehensive beneficiary database should ideally be available securely to all relevant ministries and agencies. Linking digital IDs with bank and/or mobile money accounts would facilitate greater financial inclusion, helped by easily verifiable e-KYC requirements. This would also allow quick and targeted delivery of social protection programs. The PM 2020 Decisions 749/QD-TTg and 2289/QD-TTg approving the national digital transformation program and promulgating the national strategy on the 4th industrial revolution, respectively, are steps in the right direction. Implementation decrees would need to translate the government's objectives (for instance on improvements in global rankings in e-gov indices) into actionable plans and targets. Data sharing across government agencies will also be key to implement these ambitious plans. However, it is important to note that gains are not automatic as technology is only a tool, opening up new opportunities, but also new risks. Appropriate regulations to manage digital exclusion, cyberattacks, digital fraud, privacy and security concerns are needed to reap the benefits of digitalization ([Agur et al, 2020](#); [Una et al, 2020](#)).

References

- Agur, Itai, Soledad Martinez Peria, and Celine Rochon (2020) [“Digital Financial Services and the Pandemic: Opportunities and Risks for Emerging and Developing Economies”](#), *Special Series on COVID-19*.
- Bangura, J. A. (2016) [“Saving Money, Saving Lives: A Case Study on the Benefits of Digitizing Payments to Ebola Response Workers in Sierra Leone”](#), Better than Cash Alliance (BTCA).
- Bazarbash, M., J. Moeller, N. N. Griffin, H. C. Villanova, E. Chhabra, Y. Fan, and K. Shirono (2020) [“Mobile Money in the COVID-19 Pandemic”](#), *Special Series on Fiscal Policies to Respond to COVID-19*. Washington, DC: International Monetary Fund.
- Cameron, A, T H Pham, J Atherton, D H Nguyen, T P Nguyen, S T Tran, T N Nguyen, H Y Trinh and S Hajkowicz (2019) [“Vietnam’s Future Digital Economy – Towards 2030 and 2045”](#), CSIRO, Brisbane.
- D'Silva, Derryl, Zuzana Filková, Frank Packer and Siddharth Tiwari (2019) [“The Design of Digital Financial Infrastructure: Lessons from India”](#), *BIS Papers* no. 106. Bank of International Settlements.
- Dabla-Norris, Era, Ganelli Giovanni, Anh Thi Ngoc Nguyen, Mai Thi Thanh Nguyen and Thuy Thi Thu Vu (2020) [“Role of Individual Characteristics and Policies in Driving Labor Informality in Vietnam”](#), *IMF Working Paper* no 2020/273. Washington, DC: International Monetary Fund.
- Davidovic, S., S. Nunhuck, D. Prady, H. Tourpe (2020) [“Beyond the COVID-19 Crisis: A Framework for Sustainable Government-To-Person Mobile Money Transfers”](#), *IMF Working Paper* no. 20/198. Washington, DC: International Monetary Fund.
- De Stefani, Alessia, Athene Laws and Alexandre Sollaci (2022) [“Household Vulnerability to Income Shocks in Emerging and Developing Asia: the Case of Cambodia, Nepal and Vietnam”](#), *IMF Working Paper* no 2022/064. Washington, DC: International Monetary Fund.
- Dercon, S. (2002) [“Income Risk, Coping Strategies, and Safety Nets”](#), *The World Bank Research Observer* 17 (2): pp. 141-166.
- Devereux, Stephen and Katharine Vincent (2010) [“Using Technology to Deliver Social Protection: Exploring Opportunities and Risks”](#), *Development in Practice* 20 (3): pp. 367-379.
- Gelb, A., and A. Diofasi Metz (2018) [“Identification Revolution: Can Digital ID Be Harnessed for Development?”](#), Washington, DC: Center for Global Development.
- Gelb, A., and Anit Mukherjee (2020) [“Digital Technology in Social Assistance Transfers for COVID-19 Relief: Lessons from Selected Cases”](#), *CGD Policy Paper* 181. Center for Global Development.
- Gelb, A., and C. Decker (2011) [“Cash at Your Fingertips: Biometric Technology for Transfers in Resource-Rich Countries”](#), *CGD Working Paper* 253. Washington, DC: Center for Global Development.
- Gelb, A., and J. Clark (2013) [“Identification for Development: The Biometrics Revolution.”](#) *CGD WP* 315.
- Gelb, A., Anit Mukherjee, and Kyle Navis (2020) [“Citizens and States: How Can Digital ID and Payments Improve State Capacity and Effectiveness?”](#), Washington, DC: Center for Global Development.
- Gentilini, U., M. Almenfi, I. Orton, and P. Dale (2020) [“Social Protection and Jobs Responses to COVID-19: A Real-Time Review of Country Measures”](#), Washington, DC: The World Bank Group.
- GSMA (2017) [“Aadhaar: Inclusive by Design: A look at India’s National Identity Programme and its Role in the JAM Trinity”](#), London.
- GSMA (2019a) [“Overcoming the KYC Hurdle: Innovative Solutions for the Mobile Money Sector”](#), London.

- GSMA (2019b) [“The Mobile Money Regulatory Index”](#), London.
- Handayani, S. W., M. Domingo-Palacpac, P. Lovelock, and C. C. Burkley (2017) [“Improving the Delivery of Social Protection through ICT—Case Studies in Mongolia, Nepal, and Viet Nam”](#), *ADB Sustainable Development Working Paper Series* no. 50. Manila, Philippines: Asian Development Bank.
- ILO (2013) [“Innovations in Extending Social Insurance Coverage to Independent Workers: Experiences from Brazil, Cape Verde, Colombia, Costa Rica, Ecuador, Philippines, France and Uruguay”](#), Geneva: ILO.
- IMF (2018) [“Digital Government”](#), Chapter 2 in April 2018 *Fiscal Monitor: Capitalizing on Good Times*.
- IMF (2020) [“Digitalization in Sub-Saharan Africa”](#), Chapter 3 in *SSA REO*.
- IMF (2021) [“Vietnam : 2020 Article IV Consultation-Press Release; Staff Report; and Statement by the Executive Director for Vietnam”](#), *IMF CR 2021/042*. Washington, DC: International Monetary Fund.
- Lund, S. O. White and J. Lamb (2017) “The Value of Digitalizing Government Payments in Developing Economies”, Ch 13 in [Digital Revolutions in Public Finance](#), edited by S. Gupta et al.
- Morgan, Peter; and Trinh Long (2021) [“Impacts of COVID-19 on Households in ASEAN Countries and Their Implications for Human Capital Development”](#), ADBI Working Paper Series 1226/2021.
- Muralidharan, Karthik, Paul Niehaus and Sandip Sukhtankar. 2016. [“Building State Capacity: Evidence from Biometric Smartcards in India”](#), *American Economic Review*, 106 (10): pp. 2895-2929.
- Prady, Delphine (2020) [“Reaching Households in Emerging and Developing Economies: Citizen ID, Socioeconomic Data, and Digital Delivery”](#), *Special Series on Fiscal Policies to Respond to COVID-19*.
- Sahay, R., U. E/ von Allmen, A. Lahreche, P. Khera, S. Ogawa, M. Bazarbash, and K. Beaton (2020) [“The Promise of Fintech Financial Inclusion in the Post COVID-19 Era”](#), *MCM Paper* no. 20/09.
- Townsend, R. M. (1995) [“Consumption Insurance: An Evaluation of Risk-Bearing Systems in Low-Income Economies”](#), *The Journal of Economic Perspectives* 9 (3): pp. 83-102.
- Una, Gerardo, Richard Allen, Sailendra Pattanayak and Gwenaelle Suc (2020) [“Digital Solutions for Direct Cash Transfers in Emergencies”](#), *Special Series on Fiscal Policies to Respond to COVID-19*.
- World Bank (2015) [“Study on e-ID Infrastructure to Improve Public Services Delivery: Technical Report”](#).
- World Bank (2016) [“Digital Dividends”](#). Washington, DC: The World Bank Group.
- World Bank (2018a) [“G20 Digital Identity Onboarding”](#), G20 Argentina 2018. Washington, DC: The World Bank Group.
- World Bank (2018b) [“Public Sector Savings and Revenue from Identification Systems: Opportunities and Constraints”](#), Washington, DC: The World Bank Group.
- World Bank (2019) [“The Digital Economy in Southeast Asia: Strengthening the Foundations for Future Growth”](#), Washington, DC: The World Bank Group.
- World Bank (2021a) [“The Distributional Impact of COVID-19 Fiscal Policies on Households, with Emphasis on Da Nang City”](#), Washington, DC: The World Bank Group.
- World Bank (2021b) [“The Labor Market and the COVID-19 Outbreak in Vietnam: Impacts and Lessons Learned for Social Protection”](#), Washington, DC: The World Bank Group.
- World Bank (2022a) [“Assessment of VSS’s Voluntary Pension Scheme and Policy Recommendations”](#), Washington, DC: The World Bank Group.
- World Bank (2022b) [“No Time to Waste: The Challenges and Opportunities of Cleaner Trade for Vietnam”](#) Taking Stock January 2022”, Washington, DC: The World Bank Group.

Annex: Data and Measurements

The main source of individual and household-level data used in this paper is the Vietnam Household Living Standards Survey (VHLSS), a nationally and regionally representative survey conducted by Vietnam's General Statistics Office (GSO). This survey is conducted periodically and collects information on

- Demographic characteristics related to living standards
- Education
- Health and healthcare
- Labor and employment
- Income
- Expenditures (consumption and durable goods)
- Housing, electricity, water, sanitation facilities
- Participation in poverty alleviation programs
- Household businesses
- Commune general characteristics

To establish our baseline of the Vietnamese economy, we use the 2018 vintage of the VHLSS, as it is the latest available year before the Covid-19 crisis and thus provides a useful benchmark for the economy under “normal” circumstances. Around 46,995 households were surveyed in face-to-face interviews, but only 9,399 households were asked about the full range of questions (income, expenditure, and other issues). See <https://www.gso.gov.vn/en/data-and-statistics/2020/05/result-of-the-vietnam-household-living-standards-survey-2018/> for more details on the survey and data collection.

After basic data cleaning, our sample retains information on 4,713 households, including separate data on 17,478 individuals (members of those households, including children and elderly members). Individual data covers age, education, employment, and other basic demographic questions.

Variable Construction

Income is a measure of the household's net annual income, aggregating all sources of revenue net of costs. It is calculated as the sum of

- All revenues from employment, including wages, bonuses, subsidies, and other revenues
- Revenue from education and healthcare aid, as well as from rental of properties
- Sales of crops and revenues from land, animal husbandry, hunting, agriculture, aquaculture, forestry and other non-farm activities, **net of their respective costs of production.**

Financial access is measured by the use of financial services by any household member in the month before the survey was conducted. Specifically, we assume a household has financial access if any of the following services are used: ATM cards, bank accounts, savings accounts, credit cards, life insurance, securities, and other insurance. If none of those are used, we assume the household does not have financial access.

Digital access is measured in a similar way to financial access: we consider members of a household to have digital access if at least one member of that household claims to have used the internet in the month prior to answering the VHLSS.