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Financial Inclusion and Savings in Indonesia

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Abstract: *This paper discusses the status of financial inclusion in Indonesia and examines the impact of financial inclusion – based on availability of bank branches on household outcomes – in Indonesia. Based on analysis of the World Bank's Financial Inclusion Survey (FINDEX) data, Indonesia has made some progress on expanding financial inclusion. The share of individuals with bank accounts rose from less than 20% to just under 50% in 2017. Interestingly, while the gain between 2011 and 2014 was greater for individuals in the upper 60 percentile of income, the gains between 2014 and 2017 were more pro-poor. This progress was made possible due to concerted government efforts to expand financial inclusion. In our empirical analysis, we study how financial inclusion enables households with income gains into savings for assets and earnings. Using the Indonesian Family Life Survey data, we find that living in areas with high density of bank branches helps poor households accumulate savings. The marginal effect of financial inclusion on savings is highest amongst the households in the bottom quintile of per capita consumption distribution. Thus, access to formal financial institutions can lead to improvement in household welfare.*

Keywords: Financial inclusion, savings, Indonesia

JEL Classifications: G20, D14, I31

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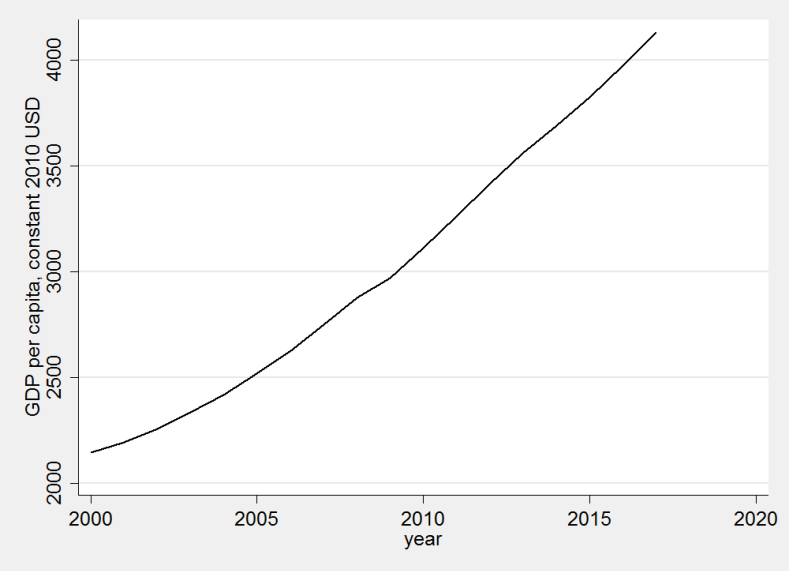
1. Introduction

Financial inclusion can contribute towards poverty alleviation by enabling poor households to use products and services of formal financial institutions to optimally save, invest, and manage risks, and to benefit from the financial deepening of the broader economy. The benefits of financial products are well known (Beck and Demirgüç-Kunt, 2006; Karlan and Morduch, 2010): with savings, households can accumulate assets, which in turn can enable them to invest in capital and access credit. If they can obtain credit at a reasonable interest rate, they can make profitable investments and grow their enterprise. With insurance, poor households can insure against unanticipated income and health shocks due to environmental conditions (e.g. inclement weather, pollution, natural disasters, etc), macroeconomic upheaval (recession, financial crisis), or other reasons. Currently, many poor households rely on informal sources to meet their financial needs—borrowing from family and friends or village moneylenders that charge exorbitant fees, and saving in informal groups. These sources are usually costly, inadequate, risky, and insufficiently regulated, which may lead to exploitation. Recognising the importance of access to formal finance in improving household welfare, many developing countries have been emphasising financial inclusion over the past decade.

Focused financial inclusion policies have met with some success in encouraging bank account openings, which remain the most basic financial service. However, existing studies find that while opening a bank account is an important first step towards financial inclusion, it does not reliably translate into usage. When poor households were offered opportunity to open a savings account at low cost, Prina (2015) found high frequency of usage amongst new account holders in Nepal. However, a similar intervention in three African countries by Dupas et al. (2018) found that new bank account holders did not actively use them. Lack of income was an important barrier in the latter setting. This suggests income growth and financial inclusion interact positively to improve welfare. The question then is whether financial inclusion in a high growth economic environment enables households to make investments that puts them in a stable trajectory of welfare gains.

This paper studies the relationship between financial inclusion and household savings in Indonesia, a setting with rapid economic growth *and* concerted government effort to expand financial inclusion over the past decade. The setting allows us to explore how financial inclusion translates income growth into accumulation of financial assets. Indonesia has consistently grown at over 5.5% per year over the past decade, with nominal income per capita rising by US$1,300 between 2006 and 2016, an increase of 50% (see Figure 1). The additional income would have enabled households to expand their consumption and move out of poverty. Indeed, the World Bank estimated that during this period poverty headcount fell from 22.5% to 6.5%.[3] Nonetheless, many households in Indonesia remain vulnerable to falling back into poverty, and rising inequality is a concern, making inclusivity an important policy concern (Tim Nasional Percepatan Penanggulangan Kemiskinan 2018). Thus, understanding the relationship between financial inclusion and savings behaviour can contribute to the discussion about sustained poverty alleviation.

Figure 1. Indonesia's Real GDP per capita
(in 2010 US$)



GDP = gross domestic product.
Source: Authors' calculation from World Development Indicators.

[3] This is based on a US$1.9 per day poverty line. Data are available at http://povertydata.worldbank.org/poverty/country/IDN. This is different from the Indonesian Central Statistical Agency's estimation of poverty headcount rate based on the national poverty line, which was 12.52% in 2007 and 10% in 2016.

We use the Indonesian Family Life Survey (IFLS) data on household income, assets, consumption, and economic characteristics. The same households can be observed at two points in time, that is, 2007 and 2014, which allows investigating how households with different characteristics benefit from financial inclusion. We focus on households whose baseline characteristics (in 2007) made them likely to experience income growth during the 2007–14 period, and study variation in savings in 2014 by level of financial inclusion. To measure the level of financial inclusion of the households, we construct a sub-district (*kecamatan*)[4] index derived from the density of bank branches. The calculation follows the methodology of Sarma and Pais (2014) and uses the 2014 Village Potential Survey (PODES) data.

We find that poor households have higher probability of owning a savings account if they live in areas with a higher density of bank branches. According to our baseline results, a 0.1 increase in index of financial inclusion (whose average value in the sample is 0.23) increases the probability of savings ownership by 2.9 percentage points amongst the poorest consumption quintile households in 2014 (the sample savings rate amongst the poorest quintile is 14%). The marginal effect on each of the four higher quintiles is approximately equal to 1.3%. Using different proxies for household welfare level (for example, education level of the household head) does not alter the main inference. Thus, access to formal financial institutions can be most beneficial to increase savings amongst the poorest households.

The paper contributes to our understanding of the role of financial inclusion in moving households securely out of poverty by enabling them to accumulate savings and other assets. The importance of savings on household welfare has been well-argued in the literature (Karlan et al., 2010). This is especially important in Indonesia given the vulnerability of many non-poor households to many types of shocks and lack of access to financial services for a sizable population. With rising income, Indonesia is also facing increasing inequality. It has been argued that as the country becomes more advanced, financial

[4] *Kecamatans* are the third-level sub-national administrative units in Indonesia, after provinces and districts. In 2014, there were 7,024 sub-districts, with the median sub-district comprising 6,500 families.

development can exacerbate inequality (Greenwood and Jovanovic, 1990). Hence, universal financial inclusion becomes a key factor for financial expansion to generate positive impact for economic development (Sarma and Pais, 2011).

2. Background: Financial Inclusion in Indonesia

While financial development can increase economic growth (Levine, 2005; Beck et al., 2007), one concern is that it may leave behind individuals who lack access to the formal financial system and thus exacerbate inequality. Due to low profitability and information problems, the private market tends to underserve the poor. At the same time, high monetary costs vis-à-vis informal financial services or low financial literacy (or both) may prevent use of formal financial services in developing countries like Indonesia (Cole et al., 2011). Thus, expanding financial inclusion requires additional incentives, innovative financial products, and financial education. Policymakers are now actively pursuing strategies to expand financial services amongst the poorer and underserved segments of the population. Indonesia, too, has been focused on giving a larger share of the population access to formal financial services, and, by recent statistics, has had some success in this regard.

In the first decade of 2000s, Indonesia was seriously underbanked despite steady economic recovery in the aftermath of the Asian Financial Crisis (Rosengard and Prasetyantoko, 2011). Indonesia remained well below its peers on available metrics of financial depth relative to its economic position. The World Bank's 2010 nationwide household survey of access to financial services found that 50% of Indonesia's population had access to formal financial services (World Bank, 2010). Kikkawa and Xing (2014) report that, at the time, the government pursued various strategies to improve financial access of SMEs and poor households, including financial deregulation, education, no-frills bank accounts, financial identity programmes, and government-backed small business loan programmes, while also encouraging commercial banks to establish bank branches and install more automated teller machines. This was also when Indonesia reformed financial regulations to allow operation of mobile money and enable telecommunication companies to provide financial services.

Since 2011, available data provide evidence of the progress in financial

inclusion. In this discussion, we mainly use the information from the World Bank's Financial Inclusion Database (FINDEX). Summary statistics of selected information from the FINDEX data are provided in Table 1. In terms of access, the percentage of individuals with a bank account was just 20% in 2011,[5] but increased to almost 50% in 2017; this was the fastest progress amongst developing countries in East Asia and the Pacific, although the level is still lower than the global average of 69% (Demirgüç-Kunt et al., 2018). The International Monetary Fund Financial Access Survey shows that, during this period, the number of deposit accounts with commercial banks increased from 109 million to 300 million, which is remarkable for a country with population of 264 million. The same data show that 100 million accounts were added in 2017 alone.[6]

There is also a trend of the poorer segments of the population being included in the formal financial system in greater numbers. While the gain between 2011 and 2014 was greater for individuals in the upper 60th percentile of income, the gains between 2014 and 2017 were more pro-poor. Still, the gap by income level remains high. In 2017, 57% of those in the upper 60% income distribution had bank accounts, compared to only 37% of those in the bottom 40%.

Table 1. Summary of Selected FINDEX Variables

FINDEX Variable	2011	2014	2017
Account (% age 15+)	19.6	36.1	48.9
Financial institution account (% age 15+)	19.6	35.9	48.4
Account, rural (% age 15+)	16.2	28.6	47
Account, female (% age 15+)	19.2	37.5	51.4
Account, male (% age 15+)	20	34.6	46.2
Account, income, poorest 40% (% ages 15+)	11	22.1	36.6
Account, income, richest 60% (% ages 15+)	25.3	45.3	57
Account, primary education or less (% ages 15+)	10.2	15.8	33.6
Account, secondary education or more (% ages	29.4	53.7	62.7
Account, young adults (% ages 15-24)	12.8	35.2	46.8
Saved at a financial institution (% age 15+)	15.3	26.6	21.5
Saved using a savings club or a person outside the	13.9	25.2	29.9
Borrowed from a financial institution (% age 15+)	8.5	13.1	17.2

[5] In the same year, Bank Indonesia's Household Balance Sheet Survey 2011 shows that 48% of households in Indonesia have accounts with banks and other formal financial institutions. So, financial inclusion at the household level is higher than amongst individuals as many families use a single account.

[6] http://data.imf.org/?sk=E5DCAB7E-A5CA-4892-A6EA-598B5463A34C&sId=1390030341854

Borrowed from family or friends (% age 15+)	42.3	41.5	35.7
Credit card ownership (% age 15+)	0.5	1.6	2.4
Debit card ownership (% age 15+)	10.5	25.9	30.8
Received government payments: into a financial		22.7	41
Received government payments: into an account		22.7	41
Received government payments: through a mobile		0.3	0.8
Received government transfers: first account		52.8	50.5
Received wages: into a financial institution account (% wage recipients, age 15+)		22.5	24.5
Borrowed any money in the past year (% age 15+)		56.8	54.8
Borrowed from a financial institution or used a		13.7	18.4
Debit card used to make a purchase in the past		8.5	11.3
Deposit in the past year (% with a financial		80.4	51.7
No deposit and no withdrawal from a financial institution account in the past year (% age 15+)		4.6	14.7
Coming up with emergency funds: not possible		50.2	49.6
Coming up with emergency funds: possible (%		43	46.3

Source: World Bank FINDEX Database. Not all variables were covered each year.

Progress is slower on the actual usage of financial accounts. Only 21% of the respondents reported saving at a financial institution account, which is an increase of 6 percentage points from 2011. Nonetheless, about 30% of respondents saved in an informal way using savings clubs or with a person outside the family. Debit card ownership has increased, but credit card usage remains low. Likewise, regular use of financial institutional accounts has not increased as rapidly. While 80% of the respondents with a financial institution account made a deposit in the previous year in 2014, this reduced to 52% in 2017. This is partly due the large share of newly opened accounts not being utilised. Moreover, the fraction of respondents who reported not being able to come up with emergency funds remained almost the same in 2014 and 2017.

The progress in account ownership has been possible due to a concerted government effort to expand financial inclusion. Indonesia has adopted a comprehensive financial inclusion strategy touching upon all three of its dimensions: access, usage, and quality. Commitment to a National Strategy for Financial Inclusion was specified in the Chairman Statement in the ASEAN Summit 2011. In June 2012, Bank Indonesia cooperated with the Vice President's

Secretariat - National Team of Poverty Alleviation Acceleration (TNP2K) and Fiscal Policy Agency of Ministry of Finance to issue a National Strategy for Financial Inclusion. The National Strategy, promulgated as Presidential Regulation 82/2016,[7] set an ambitious target of covering 75% of the adult population by formal financial institutions by 2019. The progress towards this goal is tracked by a specially designed National Financial Literacy and Inclusion Survey, which shows a higher rate of financial inclusion at 68% in 2016, with bank account ownership at 63.6%. To coordinate various government agencies, Indonesia has established a National Secretariat for Financial Inclusion, an inter-governmental body comprised of Indonesia's Financial Authority (OJK), Bank Indonesia, TNP2K, and the Ministry of Finance.

The national strategy pays special attention to the underserved groups: poor households, small and micro enterprises (SMEs), and students. One effective strategy has been to convert government assistance from in-kind to cash and transfer them through the bank. Furthermore, Indonesia instituted a policy of directly transferring welfare payments into a recipient's bank account rather than providing cash, thus requiring them to open bank accounts. The conditional cash transfer (Family Hope Program or PKH) is now channelled through the banks in areas where the infrastructure is present. Other agencies are also encouraged to convert their programmes, but the complexity of some makes this approach not feasible for all programs. The strategy to combine poverty programmes and financial inclusion seems to be working. Between 2014 and 2017, the share of adults receiving government transfers into a financial institution account almost doubled to 41%. Half of the respondents reported that they first opened an account to receive government transfers.

The Indonesia policy initiative is well-rounded as it targets multiple aspects of financial inclusion: access, availability, usage, and quality. Based on the National Financial Literacy and Inclusion Survey conducted by the OJK, the financial inclusion index in 2016 was 67.82%, increasing from 59.74% in 2013. On the other hand, the financial literacy index in 2016 was 29.66%, increasing from 21.84% in 2013.

[7]https://www.bi.go.id/id/perbankan/keuanganinklusif/edukasi/Contents/Booklet%20Financial%20Inclusion%20(English%20Version).pdf

The OJK also monitors the financial landscape in such areas as knowledge/literacy, usage, and access. According to the OJK survey, conventional methods and physical access are still prominent in Indonesia, with physical offices becoming the main access channel of financial products. In addition, ATMs have also become the second-largest channel for people accessing financial products. On the other hand, the utilisation of the digital technology is still small, with only 5.8% respondents using phone banking and only 25% of respondents experienced in using online transactions to access the stock market.

The number of bank branches—the most basic conduit for access to financial service for a large majority of Indonesians—is expanding. The number of commercial bank offices increased from 26,894 in 2012 to 31,618 in 2018, while the number of rural bank offices increased from 4,425 to 6,273 over the same period (Otoritas Jasa Keuangan 2015, 2019). However, the expansion of commercial bank branches has plateaued since 2015, although the number of rural banks (*Bank Perkreditan Rakyat*)[8] continues to rise. Moreover, there is substantial variation across locations. Using PODES, we create two indicators of bank branches: the share of families living in villages with a commercial bank branch, and the number of commercial bank branches per 1,000 families. These are reported in Table 2. Given the uneven distribution of Indonesia's population, the density and share of families living close to bank branches is different. While 96% of the population in DKI Jakarta lives in 'villages' with a bank branch, the rate is less than 11% in Aceh. Bank branches tend to be highly concentrated in urban and peri-urban locations.

[8] In Indonesia, commercial banks provide a full range of banking products, while rural banks mostly work with microenterprises in rural and urban areas.

Table 2. Bank Branches Density by Province

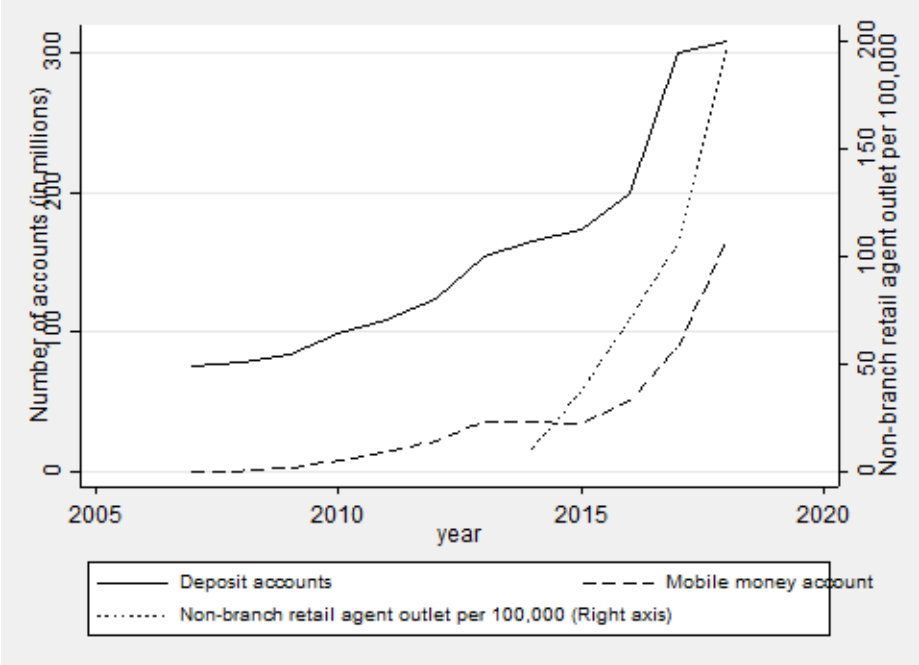
Province	Share of families	Density
Aceh	10.86	0.33
Sumatera Utara	23.53	0.29
Sumatera Barat	35.63	0.35
Riau	35.53	0.36
Jambi	21.18	0.35
Sumatera Selatan	22.67	0.27
Bengkulu	16.67	0.38
Lampung	16.58	0.20
Kepulauan Bangka Belitung	26.64	0.39
Kepulauan Riau	51.19	0.37
Dki Jakarta	96.02	0.62
Jawa Barat	32.36	0.23
Jawa Tengah	22.92	0.24
D I Yogyakarta	51.89	0.39
Jawa Timur	25.32	0.23
Banten	30.36	0.22
Bali	42.88	0.43
Nusa Tenggara Barat	18.21	0.18
Nusa Tenggara Timur	14.31	0.27
Kalimantan Barat	30.47	0.29
Kalimantan Tengah	31.07	0.25
Kalimantan Selatan	28.90	0.31
Kalimantan Timur	53.07	0.40
Sulawesi Utara	16.52	0.33
Sulawesi Tengah	16.54	0.28
Sulawesi Selatan	24.37	0.31
Sulawesi Tenggara	14.09	0.34
Gorontalo	12.23	0.31
Sulawesi Barat	16.50	0.25
Maluku	21.03	0.29
Maluku Utara	10.93	0.30
Papua Barat	35.10	0.52
Papua	24.13	0.28
Total	**28.17**	**0.32**
N	**33**	

Source: Authors' calculation from PODES 2014. Kalimantan Utara, which was a newly formed province in 2014, is included into its parent Kalimantan Timur.

The traditional model of bank branches is not commercially viable everywhere across the archipelago, which means branchless banking will play a central strategic role in expanding access to financial services. Indonesia's attempt to make progress in this respect started with regulatory changes that enabled the

launch of Digital Financial Services in 2009. The take-up of digital banking had been slow owing to regulatory hurdles, but its usage has expanded, according to the International Monetary Fund Financial Access Survey. Since the provision of branchless banking, both the number of deposits and mobile money accounts have increased rapidly (see Figure 2). Telkomsel's T-Cash and Go-Jek's Go-Pay are the most popular payment and money transfer services, which are well integrated with bank accounts. However, existing services are biased towards individuals who already have some degree of financial inclusion. For example, e-money regulations require providers to maintain a bank balance equivalent to the issued cash balance.

Figure 2. Expansion of Banking in Indonesia.



Source: International Monetary Fund Financial Access Survey Statistics

The provision of branchless banking received another boost with the launch of the service locally known as *Laku Pandai* in 2015 by four major commercial banks (Amianti, 2015). Under this programme, banks can provide (basic) savings, loan, and microinsurance services through their agents. In 2016, Bank Indonesia changed the regulation to make it easier for agents to sign up new customers for savings accounts (Diela, 2016).

The use of non-branch outlets is rising in Indonesia, with the number of non-bank retail outlets increasing exponentially from 10.75 per 100,000 adults in 2014 to 197 in 2018. In the FINDEX data, the proportion of respondents making or receiving digital payments[9] increased from 22% to 35% between 2014 and 2016. Although the rich–poor divide also exists in the use of digital payment services, progress is evident even amongst the poorest 40%, one-fifth of whom used digital payments in 2017. The service is equally available in rural areas, where one-third of respondents reported using digital payment services. Nonetheless, more effort is required to narrow the income and education gap in use of digital payments.

Table 3. Percent of Adults who Made or Received Digital Payments in the Past Year

Sample group	2014	2017
Overall	22.4	34.6
By subgroups:		
Female (% age 15+)	23.1	35.5
In labour force (% age 15+)	25.1	38.5
Income, poorest 40% (% age 15+)	10.2	21.5
Income, richest 60% (% age 15+)	30.4	43.4
Male (% age 15+)	21.6	33.7
Older adults (% age 25+)	21.1	34.2
Out of labour force (% age 15+)	17.6	27.9
Primary education or less (% age 15+)	7.3	20.1
Rural (% age 15+)	15.7	33.4
Secondary education or more (% age 15+)	35.5	47.8
Young adults (% age 15-24)	26.6	36.0

Source: World Bank Financial Inclusion database.

[9] World Bank FINDEX defines digital services as 'using mobile money, a debit or credit card, or a mobile phone to make a payment from an account or using the internet to pay bills or to buy something online, in the past 12 months, [and] also includes… paying bills or sending remittances directly from a financial institution account or through a mobile money account in the past 12 months.'

2. Literature review – financial inclusion and savings

Given the concerted effort towards increasing financial inclusion, we conduct an original microdata analysis to understand its impact on households. We focus on savings ownership as our main outcome. Savings is one of the basic human activities and is seen as a universal indicator of financial inclusion. Economic theory suggests that most households would have a reason to save money. The lifecycle hypothesis by Modigliani (1986) theorises the relationship between consumption, income, wealth, and savings of households. The main idea is that households would save part of their income to accumulate their wealth and use it in retirement. This hypothesis is supported by much evidence, especially on rich or developed countries (Karlan and Morduch, 2010).

However, the lifecycle hypothesis requires some adjustments to be able to postulate savings behaviour in poor households. Rather than accumulate wealth, poor households tend to have a precautionary motive for savings to smoothen out their consumption (Deaton and Paxson, 1997; Karlan et al., 2010). Because many poor households have volatile income, they need to save in anticipation of lump-sum expenditure in the future. In this case, poor households need a mechanism to make deposits in small amounts and make occasional large withdrawals since most of their needs to cope with emergencies will require lump-sum money.

Adequate savings also allow households to accumulate assets that enable movement out of poverty and stable future income. Increased savings induces higher expenditure on health and education. Moreover, parents will save and make investments for their children's education and health outcomes, leading to intergenerational mobility (Becker and Tomes, 1979; Deaton and Paxson, 1997).

Despite this strong motive to save, many poor households do not save enough. Whilst lack of income is an obvious constraint, there are many additional reasons. One of these is because they lack safe places to keep their money, indicating a lack of financial access (Banerjee and Duflo, 2007). This issue is exacerbated by their lack of trust in formal financial institutions and knowledge of financial products (Bachas et al., 2016). Therefore, even if banking institutions are available in their regions, they are still less likely to have accounts (Allen et al., 2012; Karlan and Morduch, 2010; Guiso et al., 2009). Recent research also

highlights behavioural reasons for low savings. Households in rural areas tend to spend a significant part of their disposable income on festival expenses for sociocultural reasons (Banerjee and Duflo, 2007; Karlan and Morduch, 2010). Moreover, there may also be a commitment issue, where individuals or households have difficulty resisting impulsive consumption, or a lack of commitment to save a part of their income gradually (Banerjee and Duflo, 2007; Karlan and Morduch, 2010).

There is a large academic literature showing that improved financial inclusion can improve the welfare of poorer households. Bruhn and Love (2014) presented evidence that financial inclusion through the increase in banking access in Mexico decreased poverty levels, with banking access positively impacting small businesses and households below median income levels. Burgess and Pande (2005) also showed similar evidence with bank openings in rural areas in India, where the government through its licensing policy strongly encouraged commercial banks to open branches in unbanked locations from the 1970s through the1990s. Therefore, reducing barriers to entry for bank branches could ease household and individual access to banking services, including account ownership (Beck et al., 2006).

While digital technology is changing the financial landscape, owning a bank account is one of the basic indicators of financial inclusion. Randomised control trials show that poor households take up savings accounts that have low costs and with banks that have branches nearby (e.g. Prina, 2015, Dupas et al., 2018). Distance to bank branches is an important barrier in Indonesia as well. The 2017 FINDEX data ask about the reason for not having a back account. The most common answer is lack of sufficient funds, which was chosen by 72% of the respondents, as shown in Table 4. However, one in three also indicated that financial institutions are too far away and financial services are too expensive.

Table 4. Reason for Not Having Bank Account

FINDEX Variable	2017
Financial institutions are too far away	33.0
Financial services are too expensive	31.7
Insufficient funds	72.1
Lack of necessary documentation	26.4
Lack of trust in financial institutions	8.0
No need for financial services ONLY	1.7
Religious reasons	5.2
Someone in the family has an account	29.2

Source: World Bank Financial Inclusion database.

While the evidence of the positive effect from bank branches towards savings ownership increase is ubiquitous, the effectiveness of bank accounts to increase savings amounts is still debated. A recent study by Dupas et al. (2018) showed that simply having bank accounts does not necessarily translate into an increase in savings, even when the accounts are subsidised. One important reason is because poor households are simply unable to save or their necessities are unable to be fulfilled with the current saving products. On the other hand, in their previous study, Dupas and Robinson (2013) found a positive effect of savings account ownership to savings amounts in rural Kenya, even with high withdrawal fees. This evidence is also supported by the finding of Ashraf et al. (2006), where the increase in savings accounts also increased savings balances, although in this case the savings account was tied with individual commitment.

3. Analysis of IFLS data

In our empirical analysis, we study how financial inclusion as determined by local bank branch density impacts household welfare. While the concept of household welfare is quite broad and depends on a multitude of factors, in a developing country context, arguably the most important measure of welfare is the ability to escape poverty in a sustained way. While current consumption is a way of measuring welfare, it is subject to transitory shocks (positive or negative) that

may provide a misleading picture. For a more permanent transition out of poverty, households must accumulate assets, which could include 'conventional, privately held productive and financial wealth, as well as social, geographic and market access positions that confer economic advantage' (Carter and Barrett, 2006, p. 179). In this regard, accumulation of savings is an important variable.

The main data for this analysis derive from the IFLS, which asks many relevant questions. The IFLS tracked the same 7,200 households (and their offshoots) since 1993. So far, five waves have been conducted in 1993, 1997, 2000, 2007, and 2014 (for details, see Strauss et al., 2009 and Strauss et al., 2016). We use the 2007 and 2014 rounds (IFLS 4 and 5, respectively).

The survey asked households about possession of various types of assets, including savings or certificates of deposit. As in many developing countries, households tend to own various types of assets. In poor households especially, durable rather than financial assets are more common. We show ownership rates of various types of assets by the poorest 40% IFLS households in Table 5. House and land ownership is high at 80%, while ownership of additional land or houses is rare. Many poor households own livestock. Vehicle ownership is high, having increased significantly between 2007 and 2014, as did ownership of household appliances.

Table 5. Asset Ownership amongst Poorest 40% of Households

Type of asset	2007	2014
House and land occupied by this household	.8	.76
Other house/ building (including land)	.063	.06
Land (not used for farm nonfarm)	.086	.085
Poultry	.35	.22
Livestock/ fishpond	.082	.049
Hard stem plant that not used for farm or non-farm business	.2	.12
Vehicles (cars, boats, bicycles, motorbikes)	.49	.65
Household appliances	.8	.94
Savings/ certificate of deposit/ stocks	.13	.18
Receivables	.059	.073
Jewelry	.47	.38
Household Furniture and Utensils	.98	.98
Other assets	.08	.031

Source: Authors' compilation from IFLS 2007 and 2014.

Some questions about financial inclusion were also available in the survey, although we do not use them in this study. Nonetheless, it is revealing to discuss some of them here as they cover aspects of financial literacy. Table 4 summarises several financial inclusion indicators of Indonesian households in 2007 and 2014. In general, Indonesian households knew how to get a loan from many sources. In addition, the majority (around 87% in 2007 and 83% in 2014) knew that they can get a loan from banks or other financial institutions. Savings rates increased slightly from 26% to 30% over the 7 years. Likewise, the average amount of savings in banks doubled since 2007, with around Rp17 million in 2014. Disaggregating the data by quantiles of per capita consumption, we find that lower expenditure group is less financially literate since fewer households could identify borrowing sources, or knew financial institutions, and they were more likely to be rejected when requesting loans. In addition, the lower expenditure group was also less likely to have savings and receivable accounts. Nonetheless, we do find that savings ownership increased by 6 percentage points amongst the poorest quintile of households, which shows gains at the bottom of the income distribution.

Table 6. Household Financial Inclusion Status in IFLS

Year	2007	2014	Unit
Known place to borrow money	88.08	82.29	%
Known financial institution (from known place)	87.01	83.56	%
Have Savings (Overall)	26.09	30.42	%
Have Savings (Bottom 20%)	9.2	15.4	%
Have Savings (Top 20%)	47.8	46.8	%
Observations	12,987	15,178	

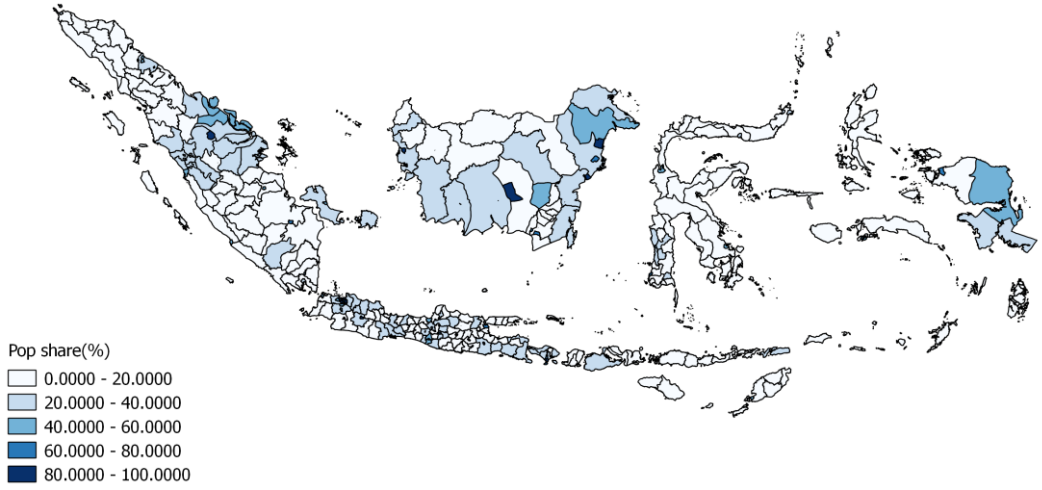
Source: Indonesia Family Life Survey (IFLS), calculated.

For our regression analysis, we focus specifically on savings ownership. For the dependent variable, we construct an indicator that takes value one if the household owned savings as well as a continuous variable that measures the value of the assets. It should be stressed that savings ownership is not the same as a savings account at a financial institution, as many Indonesians, especially those who are poor or living in rural areas, use informal savings arrangements. The FINDEX survey shows that, in 2017, almost 30% used savings clubs or saved with persons outside the family (see Table 1).

The measurement of financial inclusion at the household level is one of the key issues in the literature. Much of the literature has focused on developing national indicators (e.g. Sarma and Pais, 2011) and cross-country analysis of relationships to various development outcomes (e.g. Park and Mercado, 2015). For households, financial status, i.e. whether the household owns a savings account, is the outcome rather than measure of financial inclusion. In a recent contribution, Zhang and Posso (2019) construct a multidimensional financial exclusion index by combining proxies for savings and credit and study the relationship between financial inclusion and household income.

In this paper, financial inclusion is measured as a household's access to formal financial institutions in the form of a bank branch. The source of the data is the *Pendataan Potensi Desa* (Village Potential Survey – PODES) 2014. PODES is a census of over 60,000 villages in Indonesia that is conducted by the central statistical agency every 3 years. Starting in 2011, PODES queried the presence of commercial or rural bank branches in the village, and, if not present, the distance to nearest one. In 2011, the median village had a bank within 7 km, but there was a wide variation across provinces, with those in eastern Indonesia having sparser banks (see Figure 2). In 2014, the survey asked about the existence of facilities but not the distance to the facility in case one does not exist in the village. The 2014 survey also distinguished between government and private commercial banks.

Figure 3. District-Wise Share of Population Living in Villages with a Bank Branch



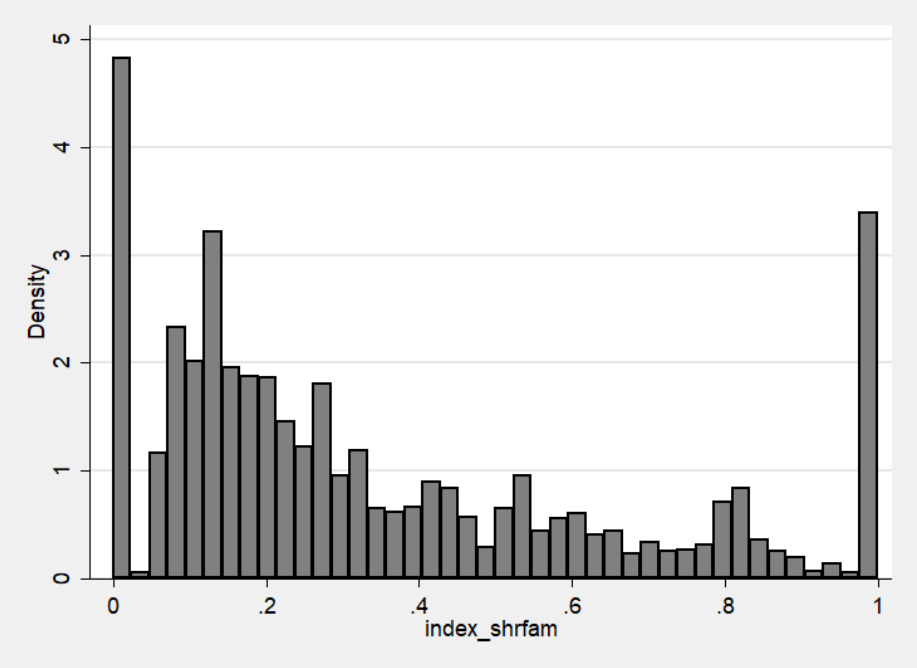
Source: Authors' calculation from PODES 2014.

We use PODES to calculate a sub-national index of financial inclusion derived from the density of bank branches in the sub-district where households were located. For location j, S_j is the share of families living in villages with at least one bank branch. Then the financial inclusion index of location j,

$$FI_j = \frac{S_j - \underline{S}}{\bar{S} - \underline{S}}$$

where $\underline{S} = \min\{S_j\} \forall j$, $\bar{S} = \max\{S_j\} \forall j$. This mirrors the index constructed by Sarma and Pais (2011), but for sub-national locations. Figure 4 shows the distribution of financial inclusion indicators across sub-districts, which shows large variations. In many sub-districts, the availability of bank branches is quite low, with an index value below 0.4.

Figure 4. Distribution of Sub-National Financial Inclusion Index



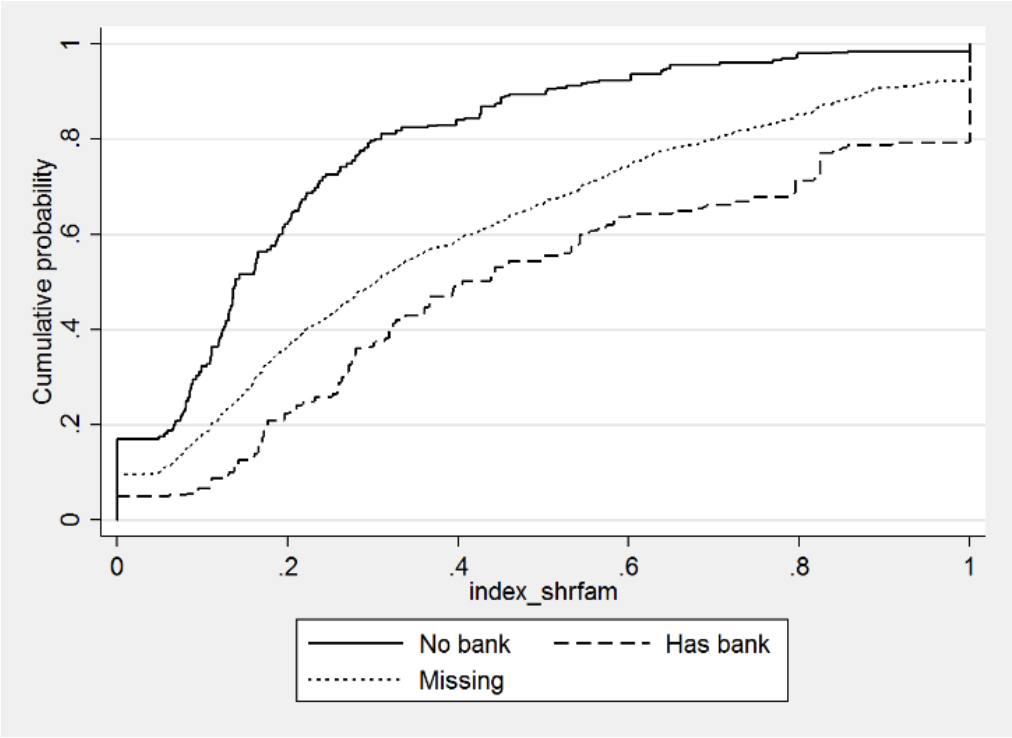
Source: Authors' calculation from PODES 2014.

We conduct some robustness checks to ensure consistency of information provided by the IFLS community survey and indicators of financial inclusion. The IFLS community module asked about the presence of bank branches in the location. Out of the 311 IFLS communities, 181 (58%) had no banks in the village

in 2007. By 2014, this number of had reduced slightly to 171. Thus, within the dataset, there is no temporal variation in the availability of bank branches. We treat financial inclusion as a time-invariant explanatory variable.

The difference in the two sources of information arises because the IFLS data pertain to the village where the household is located.[10] In Figure 4, we plot the distribution of the sub-national financial inclusion index derived from PODES separately for those IFLS communities that reported having a bank branch and those that did not. The financial inclusion index for locations with bank branches strongly dominates those without. In sub-districts with no bank present, 80% of the locations had a financial inclusion index below 0.35. On the other hand, over 60% of locations with banks also had 0.35 or higher financial inclusion index.

Figure 5. Financial Inclusion Index by Bank Presence in IFLS Sub-District



IFLS = Indonesian Family Life Survey
Note: Missing includes those households that had moved to non-IFLS locations where community data including bank facilities were not collected.
Source: Authors' calculation from IFLS 2014 and PODES 2014.

[10] While it is straightforward to merge PODES data with IFLS community locations at the sub-district level, we cannot do so at the village level.

We estimate the following relationship between outcome Y_{ijt} of household i in location j at time t and financial inclusion F_{ijt}:

$$Y_{ijt} = \delta + \beta F_{ijt} + \boldsymbol{\alpha} F_{ijt} \times T_{ij0} + \boldsymbol{\gamma} X_{ijt} + \sigma_{ij} + e_{ijt},$$

where T_{ij0} denotes household characteristics at the baseline, X_{ijt} is a vector of time-variant household characteristics, σ_i indicates unobserved time-invariant household heterogeneity, and e_{ijt} is time-variant unobserved factors. The interaction between financial inclusion and baseline characteristics is to capture the heterogeneous impact across various types of households. A household-level fixed effects estimator is used to capture unobserved variation across households.

Baseline household characteristics include income level, presence of poor health for individuals (determines demand for health expenditure), and presence of school-age children (determines demand for education expenditure). Time-variant household characteristics include the number of family members, current income, etc.

4. Results

In this section, we discuss the results of our econometric estimation. Before delving into the regression analysis, we provide some summary statistics of the household data and descriptive analysis of financial inclusion variables and household outcomes.

4.1. Descriptive analysis

The summary statistics are shown in Table 6. The median nominal monthly per capita expenditure more than doubled between 2007 and 2014, from Rp0.44 million to Rp0.9 million.[11] In 2007, 26% of the households reported that they had any savings; this increased slightly to 30% in 2014. The share of households residing in villages with any bank branch did not change during this period. For villages that did not have any bank branches, the closest bank branch was 6.5 km away.

[11] As of August 2019, Rp1 million is equivalent to US$70.

Table 7. Summary Statistics of Selected Variables in IFLS data

Variable (unit)	2007	2014
Number of households (N)	12,987	15,178
Household consumption per capita (Nominal Rp, median)	438,399	904,598
Has savings (% households)	26.1	30.4
Savings rate (% of household income, all households)		
HH education		
< 5 years	20.8	
6–8 years	23.2	
9–11 years	15.5	
12–15 years	27.8	
16 years	12.7	
Has bank branch in village (% households)	34.7	35.1
FI index (2014, median)	0.23	0.24

FI = financial inclusion, HH = household.
Source: Indonesia Family Life Survey (IFLS), calculated.

The presence of bank branches is an important factor in owning savings, as shown in Table 8. Within each consumption quintile, the likelihood of owning a savings account is higher if the household lives in a community where a financial inclusion indicator is above median. Over time, savings ownership has improved at each consumption quintile, with most improvement observed at the lowest three consumption quintiles. But the increase was larger in high financial inclusion locations. While savings ownership rate was about 10% amongst the lowest consumption quintile in 2007, it increased to 14% in low financial inclusion areas and 19% in high financial inclusion locations. We also note a slight decline in savings ownership amongst households in the highest consumption quintile in locations with a low financial index. This indicates that savings ownership could be more volatile amongst high income households in absence of financial institutions.

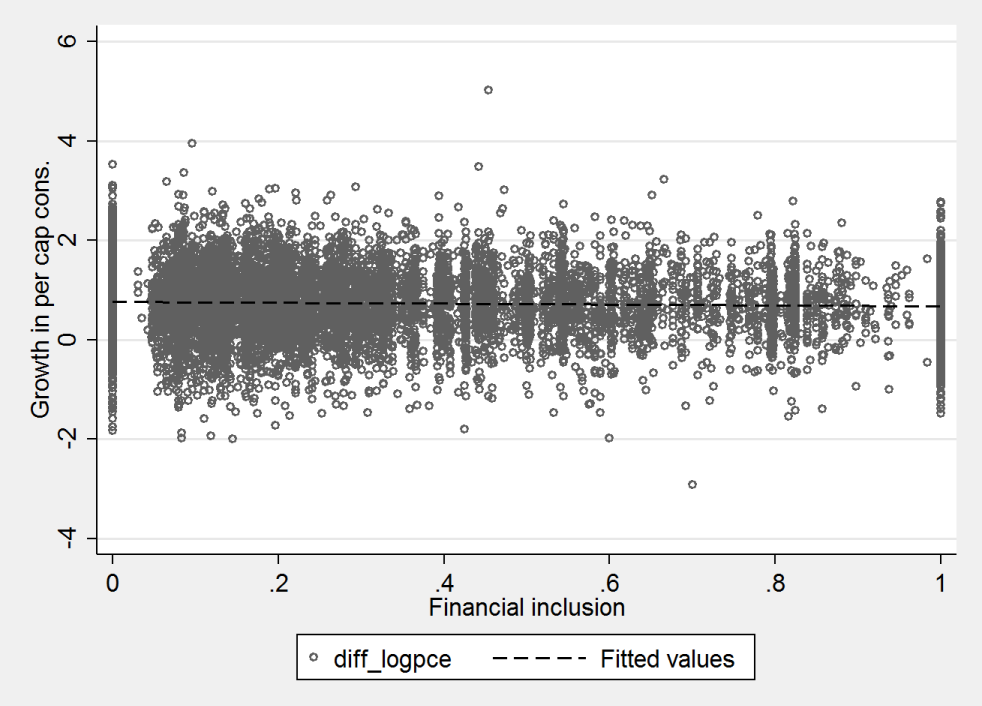
Table 8. Savings Ownership Rate by Consumption Quintile and FI indicator

Consumption quintile	(1) 2007, Low FI	(2) 2007, High FI	(3) 2014, Low FI	(4) 2014, High FI
1 (Lowest)	0.09	0.10	0.14	0.19
2	0.15	0.18	0.20	0.24
3	0.19	0.26	0.25	0.30
4	0.29	0.37	0.31	0.41
5 (Highest)	0.43	0.51	0.39	0.50
Total	0.19	0.30	0.24	0.36
N	5665	5548	7216	6964

FI = financial inclusion.
Source: Indonesia Family Life Survey (IFLS), calculated.

Consistent with national economic growth, many households in the sample experienced growth in nominal per capita consumption between 2007 and 2014. However, this growth is uncorrelated with the financial inclusion index of the sub-district, as shown in Figure 6. This allows us to study the impact of living in areas with a high degree of financial inclusion on welfare outcomes.

Figure 6. Correlation between Consumption Growth and Financial Inclusion Index



Source: Authors' calculation from Indonesian Family Life Survey 2007 and 2014. Only households observed in both years are included.

4.2. Impact on savings ownership

We now report results of a probit regression with savings ownership as the dependent variable and the financial inclusion index as the explanatory variable. We also report the coefficients on interactions between the financial inclusion index and key household characteristics. The marginal effects by categories of household characteristics are reported in Tables 9, 10, and 11, while the regression coefficients are provided in the Appendix.

In Table 9, the main explanatory variables are interactions between financial inclusion indicators and quintile of per capita household consumption. We find that greater financial inclusion enables poorer households to acquire savings. In the cross-sectional model, we find that financial inclusion has the largest impact on the lowest income quintile. Amongst the poorest households, the probability of owning a savings account increases by 29% for a 1-point increase in sub-district financial index value. At the average savings rate of 0.14 for this consumption quintile, this implies an impact of just under 21% [= (2.9/14) × 100] for 0.1 higher financial inclusion index from current average of 0.23. The estimated marginal effect on the upper four consumption quintiles is similar and about 0.14. Thus, the largest impact of financial inclusion is amongst the poorest segment of the population.

Table 9. Marginal Effect of Financial Inclusion on Savings Ownership by 2014 Consumption Quintile

	2014		**2007**	
	Marginal effect	**Std. err.**	**Marginal effect**	**Std. err.**
Consumption quintile				
1st quintile	0.29	0.05	0.07	0.10
2nd quintile	0.13	0.05	0.16	0.07
3rd quintile	0.14	0.04	0.15	0.04
4th quintile	0.15	0.03	0.13	0.04
5th quintile	0.13	0.02	0.09	0.03
N	**14,177**		**11,211**	

Note: Table shows elasticity of probability of savings account with respect to financial inclusion index. It is based on a probit regression with an indicator for savings accounts as a dependent variable and interaction between the financial inclusion index and consumption quintile as main regressors. Classification into consumption quintile is based on 2014 household per capita consumption. Standard error is computed using delta method.
Source: Authors' calculations.

For robustness check, we study the relationship between savings ownership in 2007 and financial inclusion index of 2014. The results are shown in the third and fourth columns of Table 9. We find that location's financial inclusion index in 2014 has no predictive power in 2007 for savings probability of the poorest quintile. So, we can be assured that the 2014 results are not wholly driven by other location-specific factors. Furthermore, we can infer that the income growth experienced by Indonesian households since 2007 has translated into greater savings in areas with greater financial inclusion.

Next, since current per capita expenditure could be endogenous to current savings, we instead use information from the 2007 survey on the same household for classification into consumption quintiles. This means that we drop households in 2014 that did not appear in the 2007 survey.[12] The estimates of marginal effects by 2007 consumption quintiles are shown in Table 10, column (1), with standard errors in column (2). The financial inclusion elasticity of savings probability is slightly lower—0.21 rather than 0.29—when we divide households into consumption quintiles based on their 2007 per capita consumption. However, the general pattern holds: the strongest effect is found in the lowest quintile. Moreover, the 2014 results for this subsample shown in column (3) are the same as the full sample results from Table 8, assuring that sample selection issues are not driving the main results.

Table 10. Marginal Effect of Financial Inclusion on Savings Ownership by 2007 and 2014 Consumption Quintile

	2007 definition		**2014 definition**	
	Marginal effect	**Std. err.**	**Marginal effect**	**Std. err.**
Consumption quintile				
1st quintile	0.21	0.07	0.30	0.07
2nd quintile	0.14	0.05	0.12	0.05
3rd quintile	0.17	0.04	0.16	0.05
4th quintile	0.11	0.03	0.14	0.03
5th quintile	0.11	0.02	0.13	0.03
N	**10,695**		**10,244**	

FI = financial inclusion, HH = household.
Note: Table shows elasticity of the probability of savings accounts with respect to the financial inclusion index by household education. It is based on a probit regression with indicator for savings accounts as a dependent variable and interaction between the financial inclusion index and household education categories as main regressors. Household education categories are based on the highest educational attainment of adults over 25 years in 2007. Standard error is computed using the delta method. We observe similar patterns when we use the 2007 consumption quintile definition instead of the 2014 consumption quintile definition.
Source: Authors' calculations.

[12] Although the IFLS only tracks the same households over time, if a household member moves to a new household within an IFLS province, then those households are also included in the new round.

Instead of directly using consumption, we next classify households based on determinants of consumption. Based on the highest educational attainment amongst adult household members older than 25 years, we find that households with the lowest education category (where the highest education level is 5 years) exhibit the greatest responsiveness to financial inclusion in their subdistrict (Table IV-3). Thus, the households that are most likely to have lower economic status tend to benefit from being financially included.

Table 11. FI Elasticity of Savings Probability by Household Education Status

	Marginal effect	Std. err.
HH educ. Cat. (2007)		
< 6 years	0.25	0.08
6–8 years	0.16	0.05
9–11 years	0.15	0.04
12–15 years	0.05	0.03
16 years	0.07	0.02
N	**10,084**	

FI = financial inclusion, HH = household.
Note: Table shows elasticity of the probability of savings accounts with respect to the financial inclusion index by household education. It is based on a probit regression with indicator for savings accounts as a dependent variable and interaction between the financial inclusion index and household education categories as main regressors. Household education categories are based on the highest educational attainment of adults over 25 years in 2007. Standard error is computed using the delta method. We observe similar patterns when we use the 2007 consumption quintile definition instead of the 2014 consumption quintile definition.
Source: Authors' calculations.

4.3. Impact on quantity of savings

We also model the impact of financial inclusion on the quantity of savings using hurdle regression, which allows us to utilise information on households with no savings (see Cameron and Trivedi [2013] for exposition of hurdle regression analysis). The intuition behind this approach is that the values of the dependent variable are generated by two probability distributions: one that determines whether the dependent variable takes zero value (in our case, having no savings), and one that determines the actual value given that positive (the value of savings). In our analysis, we study how the financial inclusion index affects not only probability of savings, but also the value of savings, which is used in logarithmic form.

The results are reported in Table 11. Columns (1)–(3) report results from running the estimation on the full sample, while column (4) results are when the sample is limited to the poorest three quintiles. The results indicate that financial inclusion affects whether or not a household owns savings, but not the amount of savings. The coefficient on the financial inclusion index is small and not statistically significant, nor economically meaningful for the savings model, but it does explain the ownership of the account. However, amongst the households with the poorest quintile, the financial inclusion index is significant in explaining not only selection into having savings, but also the amount of savings.

Table 12: Hurdle Regression Model for Quantity of Savings

	(1) logsavings	(2) logsavings	(3) logsavings	(4) logsavings
logsavings				
Consumption:				
2nd quintile	0.493***	0.492***	0.492***	0.435***
	(0.133)	(0.132)	(0.132)	(0.132)
3rd quintile	0.843***	0.838***	0.838***	0.739***
	(0.131)	(0.130)	(0.130)	(0.128)
4th quintile	1.155***	1.150***	1.150***	
	(0.131)	(0.131)	(0.131)	
5th quintile	1.850***	1.837***	1.837***	
	(0.145)	(0.144)	(0.144)	
HH educ cat:				
6–8 years	-0.0902	-0.0941	-0.0941	-0.192
	(0.141)	(0.140)	(0.140)	(0.160)
9–11 years	0.199	0.192	0.192	0.212
	(0.164)	(0.163)	(0.163)	(0.177)
12–15 years	0.538***	0.522***	0.522***	0.436***
	(0.152)	(0.150)	(0.150)	(0.166)
16 years	1.131***	1.113***	1.113***	1.376***
	(0.178)	(0.176)	(0.176)	(0.230)
FI Index		0.170	0.170	0.457**
		(0.172)	(0.172)	(0.224)
_cons	13.60***	13.57***	13.57***	13.48***
	(0.178)	(0.185)	(0.185)	(0.206)
selection_ll				
FI Index	0.290***		0.290***	0.235**
	(0.0833)		(0.0833)	(0.117)
HH educ cat:				
6–8 years	0.221***	0.228***	0.221***	0.240***
	(0.0541)	(0.0550)	(0.0541)	(0.0572)
9–11 years	0.386***	0.402***	0.386***	0.334***
	(0.0547)	(0.0553)	(0.0547)	(0.0684)
12–15 years	0.622***	0.658***	0.622***	0.485***
	(0.0556)	(0.0567)	(0.0556)	(0.0704)

16 years	1.145***	1.186***	1.145***	0.913***
	(0.0675)	(0.0690)	(0.0675)	(0.0975)
_cons	-1.253***	-1.212***	-1.253***	-1.318***
	(0.0751)	(0.0777)	(0.0751)	(0.0935)
lnsigma				
_cons	0.495***	0.494***	0.494***	0.461***
	(0.0153)	(0.0154)	(0.0154)	(0.0223)
N	9178	9178	9178	5929

FI = financial inclusion, HH = household.
Source: Authors' calculation. Standard errors in parentheses. * p<.1, ** p<.05, *** p<.01.

5. Discussion and Conclusion

How might the recent efforts of governments around the developing world to expand access to formal financial institutions lead to better lives for citizens? The Indonesian government's expansion of financial inclusion has relied on various strategies. Recent data suggest that it is on its way to meeting the goal it set in 2015 of financially including 75% of its population. Bank branches remain the most common form of financial access, although awareness and usage of digital financial services is also growing. With the success and growing popularity of homegrown companies like Go-Jek, Indonesia is in a good position to leverage financial inclusion for sustainable growth.

While much of the strategic push for greater financial inclusion in Indonesia took place after 2015, looking at available data still provides clues to the likely impact of this policy. Our results suggest that financial inclusion can be an effective pro-poor policy. It shows that having access to bank accounts increased savings ownership amongst the poor, which is the first step towards financial stability and long-term welfare.

However, our results are not adequate to assess some of the recent developments in the financial inclusion strategy. The advent of digital technology and recognition that true financial inclusion goes beyond access to encompass literacy and consumer protection gives rise to issues that are not salient with bank branches. Thus, further research is required to understand the impact of the recent push towards financial inclusion.

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