Digital and Financial Access: Evidence from Household Consumption in Indonesia

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Abstract: *This research focuses on the influence of formal finance access and digital financial services on household consumption expenditure in Indonesia. Researchers use secondary data by digging into information obtained from Susenas 2019 and using The Ordinary Least Square (OLS) method. The research results show access to formal financial services has a positive impact on overall household consumption. However, digital services have a negative and substantial influence on overall household consumption, particularly for eggs, but rice and other commodities have a positive and significant effect on household consumption. The results of this study are based on previous studies. The results imply that the development of Access to formal finance and digital financial services is increasingly developing, which will increase household consumption expenditure in Indonesia. The potential effects of conventional (formal) household consumption finance, digital finance can improve household consumption by reducing household credit, raising household wealth, facilitating payments, extending demand potential, and others. Policymakers need to find the right mechanism to improve the financial well-being of Indonesia's economically vulnerable population. Promoting the comprehensive and balanced development of financial institutions is an important step to stimulate household consumption. Therefore, financial institutions need to embrace digital finance as a great opportunity and expand their market by providing easier access to financial services for low- and middle-income households so that people can reap the desired benefit.*
Keywords: Financial Service, Household Consumption, Ordinary Least Square

JEL: G2, E2, C3

1. INTRODUCTION

The Central Bureau of Statistics (BPS) has released the results of the Susenas 2019. In the survey results, there is a survey block regarding financial access. Within the survey block are questions about how household behavior in Indonesia saves money in everyday life. The complements the pre-existing inclusive financial indicators, namely how many households have received credit from banks and additional access to bank financial services, both conventional and digital. The application of digital technology has reshaped all aspects of social life, and the impact of financial technology on the economy is unprecedented (Song et al., 2020). Access to financial services plays an important role in household welfare as it provides access to business opportunities, investment, savings, consumption smoothing, and insurance against unexpected events (Demirguc-Kunt & Levine, 2008), (Demirgüç-Kunt & Klapper, 2012).To the best of the author's knowledge, this article is one of the few that discusses the impact of access to conventional and digital financial services in Indonesia based on Susenas data in 2019, which was only published on 21 January 2021. Therefore, according to researchers, it is essential to discuss.

Opportunities for the development of digital financial services for the economy, especially household consumption, can be seen from Indonesia's demographic potential. Based on modern consumption theory, much empirical literature is dedicated to examining the impact of various economic factors on consumption, including digital finance (Li et al., 2020);(Yue et al., 2022). Indonesia is an economy with great potential that can absorb financial digitalization flows with the fourth largest population in the world and is dominated by Gen Z and Millennial generations. In 2018, 49% of Indonesia's adult population had bank savings accounts, and the remaining 51% were unbanked. So Indonesia has the most prospective consumer segment where more than 60% of the population (270.20 million people) in 2020 are between 15 and 64 years old (Penduduk et al., 2021).

The development of digital financial services in bank and non-bank institutions is one of the

payment systems via smartphones. Digital payment system service providers come with a wide variety of services. From internet payments, contactless (NFC / Near Field Communication, RFID / Radio Frequency Identification) to QR Code. With smartphones rapidly developing payment methods such as QRIS, it has dramatically reduced transaction costs and time of financial services, increased payment efficiency, and facilitated household consumption and household consumption transfers (Bank Indonesia, 2022). The rapid development of fintech will improve the quality and efficiency of banking services by transforming traditional financial services (Berger et al., 2003). More robust payments ecosystem creates a multiplier effect that can lead to increases in consumption (Koropeckyj et al., 2016). Financial development can increase demand for consumption by enabling intertemporal smoothing of consumption and allocating resources in a reasonable and efficient manner, so relieving consumers from liquidity constraints (Levchenko, 2005).

Such a pattern of digital finance can indicate its inclusive effect on household consumption. Digital financing includes online loans, mobile payments, smart Internet finance, Internet insurance, and other innovative products, which can affect household consumption. In addition to the potential effects of conventional (formal) household consumption finance, digital finance can increase household consumption by reducing household credit, increasing household wealth levels, facilitating payments, expanding demand potential, and others. Digital currency can affect consumption in a variety of ways. First of all, internet credit allows for the reconciliation of funds between two parties that may not be geographically similar (Pierrakis & Collins, 2014). Different types of P2P platforms have already disrupted traditional credit services, reduced standards for financial services, and improved employee well-being, all of which have led to the elimination of certain liabilities that could hinder household consumption.

So far, research has focused a lot on access to conventional financial services for household consumption, along with the rapid development of digitalization, not only in the economic sector but also in finance. This is supported by Xu (2017), who states that research on access to digital financial services related to household consumption using survey data has been conducted by several researchers, but there are still few. Song, et al (2020) studied the effect of access to financial services on household consumption in China using the OLS model. Furthermore, Lie, et al (2019) studied the impact of digital finance on household consumption in China. So, researchers need to discuss the impact of digital financial access and services by using Susenas Data 2019 in Indonesia to increase knowledge. Therefore, researchers want to see how access to Conventional financial services (banking) and digital financial services affects household consumption in Indonesia.

2. LITERATURE REVIEW

According to Mankiw (2016), Milton Friedman's theory of consumption (the Permanent Income Hypothesis) assumes that households can use a combination of savings and loans to meet their consumption needs during each life cycle period. Milton Friedman stated that income (Y) consists of permanent income (YP) and YS temporary income. A person's consumption relies on his permanent income because consumers use their savings and loans to smooth consumption in response to temporary changes in income. The consumption function is as follows:

$$C = \alpha YP$$

α is a constant that measures the fraction of permanent income that is consumed. According to the Permanent Income Hypothesis, consumption depends on permanent income YP. Furthermore, the implications of Milton Friedman's hypothesis on the average consumption tendency with the following functions:

$$APC = \frac{C}{Y} = \frac{\alpha YP}{Y}$$

According to the Permanent Income Hypothesis, average consumption tends to depend on the ratio of permanent income to current income. Households with high permanent income will consume

proportionally more. If all variations in current income were from a permanent component, the average consumption tendency would be the same across all households. However, some variations in income stem from the transitory component, and households with temporarily high incomes do not have higher consumption. Therefore, the researchers found that households with high incomes, on average, have a lower average propensity to consume. However, until now, many households, especially poor ones, are constrained by access to formal financial institutions such as savings and credit loans. So the use of financial services by households is still low. Therefore access to financial services plays a central role in theoretical household consumption.

The literature on the link between access to finance and financial services and household consumption is linked by constraints on the liquidity of funds. Where Attanasio and Weber (2010) suggest that the high dependence of household consumption on income can reveal imperfections in the credit market to a certain extent, so it is related to the lack of access to financial services. Many researchers have examined the relationship between financial development and consumption growth (Cecchetti, Flores-Lagunes, & Krause, 2006; Ang, 2011; Suzuki, 2014; Beck et al., 2018). Their result research shows a significant negative relationship between financial development and consumption volatility, as measured by the variance of consumption and aggregate measures of financial development. In otherwise, The improvement of the overall level of fintech will not only promote entrepreneurship and employment but also promote household consumption and narrow the urban-rural consumption gap by increasing income (Amer, Buckley, Zetzsche, et al., 2020). Therefore,Digital financial literature can increase consumption according to the World Bank (2014), United Nations (2016), and ADB (2016), which states that digital financial services can be applied to low-income populations, thereby increasing their access to financial services so that financial inclusion rises in the country.

3. METHOD

Researchers used secondary data issued by the Indonesian Central Bureau of Statistics (Susenas data 2019), which includes 320,000 sample households spread across all provinces and 514 districts/cities in Indonesia. Susenas data provides detailed information on household demographics, characteristics, expenditures, and etc. To evaluate the effect of formal financial access on household consumption in Indonesia, the researchers also added digital financial services as a variable. The variables are potential for endogeneity, which allows for causality between digital financial services and household consumption. Formal financial institutions tend to open more branches in areas with higher consumption levels, and households with higher consumption tend to use digital financial services more. So, this study analyzes using 2 models of Ordinary Least Square (OLS) and data processing using Stata. The model used in this study refers to the journal Song, et all (2020). The following is an estimate of the equation:

$$\ln C_{icj} = \gamma_0 + \gamma_1 Digital_{icj} + \gamma_2 School\_Rate_{icj} + \gamma_3 Household\_Members_{icj} + \gamma_4 Marital\_Status_{icj} + \gamma_5 Prov_j + \epsilon 1_{icj} \tag{1}$$

$$\ln C_{icj} = \beta_0 + \beta_1 Access_{icj} + \beta_2 School\_Rate_{icj} + \beta_3 Household\_Members_{icj} + \beta_4 Marital\_Status_{icj} + \beta_5 Prov_{cj} + \epsilon 2_{icj} \tag{2}$$

Where i, c, and j refer to the household (i), district (c), and province (j). C consists of three variables (Rice Consumption, Egg Consumption, and Consumption of other commodities), all using the natural logarithm. Digital refers to digital financial indicators, which measure household use of the number of digital financial service agents in each region. Access represents access to formal services, as measured by the number of bank branches and ATMs per 100,000 population in each region. The control variable included in the study is the demographic characteristics of the head of the household, which is the schooling period of the head, and variable Characteristics represented by the number of household members and marital status. Prov denotes a dummy province.

4. RESULTS AND DISCUSSION

The following are the results of research on the effect of access to formal finance and digital finance on household consumption in Indonesia:

Table 1. The Estimates for Coefficients of Parameters using OLS with Robust Standard Error

(1)	Household Consumption
Digital	-0.023***
	(0.000)
School_Rate	0.034***
	(0.000)
Household_ Members	0.005***
	(0.000)
Marital_Status	-0.022***
	(0.001)
Prov	-0.096***
	(0.001)
Observations	1,018,844
R-squared	0.024

(2)	Household Consumption
Access	0.004***
	(0.001)
School_Rate	-0.013***
	(0.000)
Household_ Members	-0.002***
	(0.000)
Marital_Status	0.003***
	(0.000)
Prov	0.018***
	(0.000)
Observations	272,562
R-squared	0.011

Note: the standard error is in the bracket.
*** = 1% significance level, ** = 5% significance level, * = 10% significance level.
Source: data processed, 2023

Based on Table 1, in the first Household Consumption equation, it is known that the coefficient of determination is 0.024. this means that exogenous variables affect Household Consumption by 2.4%, and the remaining 97.6% is explained by other variables that are not included in the reduction. In the F test, the estimated value of Prob > chi2 is 0.000, meaning that all exogenous variables significantly affect household consumption. The T-test can be seen from the p-value of each exogenous variable, where the p-value is $<5\%$. So, exogenous variables individually influence household consumption.

In the second result, the coefficient of determination is 0.011, this means that the exogenous variable influences Household Consumption by 1.1%. The remaining 98.9% is explained by other variables not included in the agreement. In the F-test, the estimation results are obtained. In the F test, the estimated results of the Prob > chi2 value are 0.000, meaning that all exogenous variables

significantly affect household consumption. The T-test can be seen from the p-value of each exogenous variable, where the p-value is <5%. So, exogenous variables individually influence household consumption. So, the conclusion from the two results above is that formal financial access has a positive and significant effect on Indonesian household consumption. Meanwhile, digital financial services has a negative impact on Indonesian household consumption.

Table 2. The Estimates for Coefficients of Parameters using OLS with Robust Standard Error
Three Categories of Household Consumption

	Rice	Egg	Others
	1	2	3
Digital	0.001	-0.005***	0.001
	(0.001)	(0.002)	(0.001)
School_Rate	-0.003***	0.007***	-0.003***
	(0.001)	(0.002)	(0.001)
Household_ Members	-0.001***	0.005***	-0.001***
	(0.000)	(0.001)	(0.000)
Marital_ Status	0.004***	-0.029***	0.005***
	(0.002)	(0.004)	(0.002)
Prov	0.366***	-0.149***	0.037***
	(0.002)	(0.006)	(0.002)
Observations	68,641	53,714	68,641
R-squared	0.0041	0.0127	0.0041
Access	0.013	0.003	0.013
	(0.008)	(0.028)	(0.009)
School_Rate	0.006***	-0.028***	0.006***
	(0.002)	(0.006)	(0.002)
Household_ Members	-0.001	0.006***	-0.001
	(0.001)	(0.002)	(0.001)
Marital_ Status	0.005***	-0.024**	0.005
	(0.004)	(0.014)	(0.004)
Prov	0.091***	-0.357***	0.091***
	(0.006)	(0.021)	(0.006)
Observations	10,953	8,603	10,953
R-squared	0.0216	0.0379	0.0216

Note: the standard error is in the bracket.
*** = 1% significance level, ** = 5% significance level, * = 10% significance level.
Source: data processed, 2023

Classical Assumption Test
The simultaneous model is good if it fulfills several classic assumptions: non-heteroscedasticity, normally distributed errors, and non-multicollinearity. The following is a test of these assumptions.

a) Normality Test

Table 3. Result of The Normality Test

Equation 1		Equation 2	
Probability	0.00000	Probability	0.00000

Source: Data Processed, 2023

In the normality test, when the probability is > 0.05, and if the probability is <0.05, the data is not normally distributed. The normality test in this study using the Shapiro-Wilk test obtained a probability value of 0.00000 <0.05, so it can be concluded that all the data is not normally distributed.

b) Multicollinearity Test

Table 4. Result of Multicollinearity Test

Variables	VIF	1/VIF
Household Consumption		
Digital	1.63	0.61
School_Rate	1.55	0.65
Marital Status	1.11	0.90
Household_Member	1.04	0.96
Prov	1.08	0.93
Household Consumption		
Access	1.00	0.99
School_Rate	1.05	0.95
Marital Status	1.06	0.94
Household_Member	1.05	0.95
Prov	1.04	0.96

Source: Data Processed, 2023

In the multicollinearity test, if the VIF value is <10, there are no symptoms of multicollinearity in the data. In this study's multicollinearity test, all variables' VIF value was smaller than 10. It can be concluded that Consumption and Access equation were no symptoms of multicollinearity in the research data.

c) Heteroscedasticity Test

Table 5. Result of Heteroskedasticity Test

Equation 1		Equation 2	
Chi2 (1)	34931.21	Chi2 (1)	335.39
Probability	0.00000	Probability	0.00000

Source: Data Processed, 2023

Heteroscedasticity test using Breusch-Pagan. When the probability is greater than 0.05, there are no symptoms of heteroscedasticity in the data. If the probability is less than 0.05, the data shows symptoms of heteroscedasticity. In the heteroscedasticity test using Breusch-Pagan, the probability value is 0.00000 <0.05, so there are symptoms of heteroscedasticity in the data. This study uses OLS with a robust standard error to eliminate bias. In the robust OLS model, it is found that the probability F is 0.0000 <0.05, which means that simultaneously or simultaneously, the X variable affects the Y variable. Then, the R-squared value is also obtained, which is 0.8846, which means that 88.46% of

the X variable is in the model able to explain variable Y.

In the OLS model with robustness, we also get the T-test or partial test of variable X on variable Y, Access affecting the consumption, as evidenced by the probability value of 0.000, which is smaller than 0.05 with a coefficient value of 3023,161 with a positive correlation, which means that if Access increases by 1 unit, then consumption will also increase by 3023,161 rupiah. Furthermore, digital also affects consumption as evidenced by the probability value of 0.0000, which is smaller than 0.05 with a coefficient value of 2068,571 with a positive correlation, which means that if digital increases by 1 unit, consumption will increase by 2068,571 rupiahs. In the demo, it also found that demos affect consumption as evidenced by the probability value of 0.000, which is smaller than 0.05 with a coefficient of 85.8457 with a negative correlation, which means that when the demo increases by 1 unit, consumption will decrease by 85.8457 rupiahs. Furthermore, char also affects consumption with a probability value of 0.000, smaller than 0.05 with a coefficient of 561.3254 with a positive correlation, which means that if char increases by 1 unit, consumption will also increase by 561.3254 rupiahs. In this model, it is also found that provinces in the dummy with 1 = city and 0 = village have differences in consumption levels, as evidenced by the probability value of 0.000, which is smaller than 0.05. It is found that the highest level of consumption is in cities due to a positive coefficient value, which means higher for number 1, namely urban.

According to Beck, et al (2007), the existence of financial institutions can reduce the impact of information asymmetry and customer transaction costs, which will increase household consumption by improving service facilities and reducing credit constraints. People living close to financial institutions will easily access better formal financial services by obtaining credit requests/loans and tend to consume more. Financial institutions will provide access to financial services by facilitating or mobilizing savings and providing payment services. This result is also in line with the results of research conducted by (Luo et al., 2022), financial technology innovation can significantly boost household consumption at the national level. can significantly encourage household consumption at the national level where financial technology can increase income through the main transmission channel, namely through household consumption.

The increasing digital financial services will expand the reach of consumers' access to financial service providers. Gombel, et al (2017) and Ozili (2018) state that people can more easily access financial services via cell phones at lower costs because digital technology lowers the cost of providing financial services and benefits providers to serve poorer and faraway customers. The literature on the link between access to finance and financial services and household consumption is connected by constraints on the liquidity of funds. Attanasio and Weber (2010) argue that high household consumption dependence on income can reveal imperfections in the credit market to a certain extent so that it is associated with a lack of access to financial services. Li et al (2023), electronic payments encourage urban, highly educated and young households to consume significantly more goods.

Many researchers have examined the relationship between financial development and consumption growth (Cecchetti, Flores-Lagunes, & Krause, 2006; Ang, 2011; and Suzuki, 2014). Their result is a significant negative relationship between financial development and consumption volatility, as measured by the consumption variance and the aggregate measure of financial development. Jack & Suri (2014) use the quasi-natural experiments from Kenya to study the impact of mobile payment on consumption smoothing and they find positive and significant results. Electronic payments can encourage an individual's decision to buy, which impacts increasing household consumption in Nigeria (Oyelami et al., 2020). The improvement of the overall level of fintech will promote household consumption and narrow the urban-rural consumption gap by increasing income (Arner et al., 2020). Digital financial literature can increase consumption according to the World Bank (2014), United Nations (2016), and ADB (2016), which states that digital financial services can be applied to low-income populations, thereby increasing their access to financial services so that financial inclusion rises in developing countries.

5. CONCLUSION AND SUGGESTION
CONCLUSION

In this paper, we investigate the impacts of formal finanacial access and digital services on household consumption in Indonesia by using representative household survey data for Indonesia

(Susenas 2019). In general, OLS estimates show that access to formal financial services have positive and significant impacts on overall household consumption. The results of this study are in accordance with previous studies. However, digital services shows negative and significant effect on household consumption overall, especially for egg but for rice and other commodity have positive and significant to household consumption. This implies that, in comparison to formal financial access, the development of digital services is more crucial for promoting household consumption. It is important for policymakers to find the right mechanism to improve the financial well-being of Indonesia's economically vulnerable population. Promoting the comprehensive and balanced development of financial institutions is an important step to stimulate household consumption. Therefore, it is important for financial institutions to embrace digital finance as a great opportunity and expand their market by providing easier access to financial services for low- and middle-income households so that people can reap the desired benefit.

SUGGESTION

This research separates the financial of access and digital services to avoid endogeneity. So, the model uses ordinary least square. The potential for endogeneity is that there may be a causality between digital financial services and household consumption. Formal financial institutions tend to open more new branches in areas with higher consumption levels, and households with higher consumption tend to use digital financial services more. As a result, the OLS regression is biased. For future research, you can use a better model than OLS, such as 2SLS.

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