

THE IMPACT OF FINANCIAL TECHNOLOGY ON CONSUMPTION FUNCTION OF THE THEORY OF ABSOLUTE INCOME HYPOTHESIS: A PARTIAL ADJUSTMENT MODEL APPROACH (THE INDONESIAN EVIDENCE)

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Abstract. Households are economic actors that play a significant role in the economic condition. Thus, households' consumption expenditures are a variable that deserves a through analysis in an economy. This study aims to identify the impact of financial technology on household consumption by using the theory of the absolute income hypothesis. We use the partial adjustment model (PAM) approach and the Chow test to detect the structural change on households' consumption function in Indonesia with the observation period of 1990–2017. The results demonstrate that Indonesian households' consumption function exhibits structural change because of the development of financial technology 3.0 era that started in 2000. Besides, the partial adjustment model also suggests that financial technology positively affects Indonesian households' consumption in both short-run and long-run. The findings imply that on the one hand, the findings are a positive signal to rely on fintech as the factor that encourages economic growth in Indonesia. On the other hand, the results indicate that fintech motivates the public to be more consumptive that will potentially lead to higher inflation rates.

Keywords: household consumption, theory of absolute income hypothesis, financial technology, partial adjustment model, Chow test.

JEL Classification: E2, O3.

Introduction

Households are the most dominant economic actor in the economy of each country, and Indonesia is not an exception. The large contribution of household consumption to total Gross Domestic Product (GDP) confirms the dominant role of households in the economy. In 2010–2018, household consumption expenditure's average contribution to Indonesia's GDP was 55.52 percent. The figure indicates that household behaviors significantly affect the economy. For example, the slowdown of household consumption in an economy will likely lead the economy into recession. Conversely, the fast growth of household consumption will potentially cause hyperinflation. Thus, household behaviors, as indicated by household consumption, is a crucial variable in an economy that deserves more attention.

Numerous factors affect household consumption, including income, as suggested by the absolute income hypothesis proposed by Keynes. Tulai (2015) finds that the absolute income hypothesis theory explains consumption behavior in Romania. In the short run, increased income will increase consumption and reduce the proportion of income devoted to consumption. Similarly, Ofwona (2013) and Zafar (2016) demonstrate that the absolute income hypothesis theory applies in consumption functions in Kenya and Pakistan where income is the main factor that determines consumption. However, Alimi (2013) documents that Nigeria's increased income is not associated with a decreased income portion for consumption (average propensity to consume/APC). Besides, Nigeria's marginal propensity to consume (MPC) is greater than one, implying that other factors than income affects Nigerian consumption. Income is not the main factor that

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affects consumption, or the absolute income hypothesis theory does not apply in Nigeria.

Besides income level, macroeconomic variables such as inflation rate and savings also affect household consumption rate (Verter & Osakwe, 2014). Their study even shows the causal relationship between the consumption rate with the savings rate in the Czech Republic. Meanwhile, Arapova (2018) find that fiscal policies through government expenditure instruments and monetary policies through interest rate instruments affect household consumption. In this respect, fiscal policies exhibit a stronger effect on household consumption rate than monetary policies.

Not only macroeconomic variables, but microeconomic variables also affect household consumption rate as shown by Gounder (2012) that education level, demographic factors, and residential location affect consumption rate in Fiji. Similarly, the number of working family members, employment status, and marital status affect the consumption rate in Northern Africa (Sekhampu, 2013). Besides these factors, the development of financial technology (Fintech) also affects the consumption rate (Ackman & Khorunzhina, 2017; Almasifard & Saeedi, 2017).

Technology-based financial services or financial technology (fintech) develops rapidly in Indonesia. According to Fintech Report 2018 (DailySocial, 2018), there were 235 registered Indonesian fintech firms in 2017 with financing-type fintech dominated the figures (39 percent), followed by lending-type fintech firms (24 persen), aggregators (11 persen), crowdfunding (8 persen), financial planning (7 persen), and other fintech types (11 persen). Besides, the number of fintech users also increased significantly from 18.46% in 2016 to 58% in 2018. Fintech development will affect public consumption and especially household consumption (Agarwal et al., 2019; Agarwal & Chua, 2020; Li et al., 2020; Bäckman & Khorunzhina, 2017; Agarwal et al., 2020). However, Almasifard and Saeedi (2017) reveals that fintech does not affect household consumption.

Fintech development simplifies financial transactions and changes economic transaction and consumption patterns. Specifically, financing-type fintech that dominates the Indonesian fintech market will affect household consumption. Because household consumption is the largest Indonesian GDP component, it is important to identify the effect of fintech development on Indonesian household consumption. Prior studies on the effect of fintech on household consumption largely focus on digital payments as the part of fintech and not on the entire fintech. Besides, previous studies have not identified whether fintech development will lead to structural changes in household consumption patterns. Thus, this study aims to identify whether Indonesia experiences the structural change of household consumption patterns due to fintech development (Fintech 3.0 era) that began in 2000. Also, this study analyzes the effect of Fintech era 3.0 on the Indonesian household consumption both in the short-run and in the long-run. Identifying the effect of fintech on household consumption patterns helps policymakers, especially the

central bank, control demand-side price stability because household consumption is the largest component of aggregate demands.

1. Literature review

1.1. The definition of Fintech

There are various definitions of fintech: Fintech is a term that represents firms that use modern technology in the financial system (Saksonova & Kuzmina-Merlino, 2017); fintech refers to the use of technology in mitigating problems in the financial system (Arner et al., 2015); fintech is any technology or innovation in financial activities (Gomber et al., 2018) and fintech is a technology or innovation in any form used in financial transactions to fulfill public needs (Phimolsathien, 2021). This study refers to Bank Indonesia's definition of fintech where fintech is defined as the use of technology in the financial system that produces novel products, services, technology, and business models that affect the monetary stability, the stability of financial systems, and the efficiency, security, and reliability of the payment systems (Bank Indonesia, 2018a).

1.2. The Fintech revolution

The financial industry is closely related to technology, especially information technology (IT). The financial system has relied on technology for a long time. The transatlantic cable in 1866 provided the basic infrastructure of early financial globalization. Next, the introduction of Automated Teller Machines (ATMs) by Barclays Bank in 1967 marked the beginning of modern fintech evolution (Arner et al., 2016). Fintech evolution is divided into three main phases (Arner, 2016; Arner et al., 2015):

1. Fintech 1.0 (1867–1967): From Analogue to Digital

In this phase, the abacus technology existed to facilitate financial transactions. Abacus is an early calculating technology. However, in line with financial sector development, this phase has witnessed computers that lead to computerization.

2. Fintech 2.0 (1967–2000 an): Financial Service Digitalization

In the 1960–1970 decade, the electronic payment system developed rapidly. In 1967, ATMs were initially introduced. The ATM introduction and calculator started the modern fintech 2.0 period. From 1967 to 1987, financial services shifted from analog to digital industry. This phase also started to witness internet-based technology, including E-Banking.

3. Fintech 3.0 (2000–now)

After 2008, the conditions of the financial markets have required innovative market participants in the financial service industry. This phase has gone through many shocks in the financial market, including the European economic crisis in 2008, enabling market participants to build new paradigms. These new paradigms motivate

market participants to focus on who owns resources and legitimacy to provide financial services. This phase also started to use smartphone technology in 2007 as indicated by iPhone launching, experienced Bitcoin in 2009, and P2P money transfer service in 2011.

1.3. The Consumption Theory of Absolute Income Hypothesis

The consumption theory of Absolute Income Hypothesis was developed by Keynes. The theory argues that present income is the main determining factor of household consumption rate while the interest rate factor is considered insignificant. The following is the formula of the consumption function according to the absolute income hypothesis:

$$C = \bar{C} + cY; \quad \bar{C} > 0; 0 < c < 1, \quad (1)$$

where: C is consumption; Y is disposable income; \bar{C} is autonomous consumption (a constant value); c is the marginal propensity to consume (MPC).

MPC is the additional consumption due to increased income. According to Keynes, MPC is greater than zero but less than one, indicating that greater income will lead to more consumption. Keynes also explains the average propensity to consume (APC) as the portion of income that is used to consume. Mathematically, APC value can be formulated as follows:

$$APC = \frac{C}{Y}. \quad (2)$$

APC value decreases when income increases. Keynes argues that richer individuals' APC is smaller than poorer individuals' APC (Mankiw, 2016).

Several studies identify factors that affect consumption. For example, Gounder (2012) investigates 5215 Fijian households in 2002–2003 and demonstrates that educational, demographic, and residential factors affect household consumption. Complementing previous literature, Caglayan and Astar (2012) classify Czech households into urban and rural households and show that income, age, marital status, and household size affect rural household consumption rate. Meanwhile, the consumption rate of urban households is only affected by age and sex where men have less consumption rate than women. Similarly, Sekhampu (2013), who analyzes consumption rate in Northern Africa, find that income, household size, the number of working household members, education status, and employment status positively affects household consumption rate. However, sex does not affect consumption rate in Northern Africa. Further, Verter and Osakwe (2014) indicate that income positively affects consumption while inflation and savings negatively affect household consumption on Czech Republic. Besides, their study also finds the causal relationship between consumption rate and saving rate. Next, Arapova (2018) investigates the effect of government policies on household consumption rate in ASEAN countries. The results suggest that governments' fiscal policies (as indicated by the government

expenditure variable) and monetary policies (as indicated by the interest rate variable) affect consumption. However, the impact of fiscal policies on household consumption is greater than that of monetary policies.

This study specifically aims to analyze the effect of income on consumption to confirm the theory of Absolute Income Hypothesis that has been conducted before by Ofwona (2013) who show that this theory works well in Kenya. Zafar (2016) finds similar results in the Pakistani context. Further, by using the Engle-Granger Error Correction model, Arioglu (2011) provides empirical evidence that income has both short-term and long-term effects in Austria, Belgium, Denmark, Finland, and Germany. However, income only has a long-term effect on consumption in Italy, the UK, and the US. Meanwhile, Alimi (2013) demonstrates that although income has both long-term and short-term effects on consumption, the MPC value of the consumption function in Nigeria is greater than one. The value indicates that other factors also affect consumption in Nigeria. The results of Alimi (2013) is further confirmed by Tulai (2015) and Ibbih and Peter (2017). Specifically, Tulai (2015) indicates that Romanian household consumption is also affected by income factor where increases in household income will be largely allocated to leisure and recreational expenditures. Further, Ibbih and Peter (2017) find that Nigerian household consumption is not only affected by income but also by previous consumption rate. Nigerian households likely maintain their consumption rate similar to previous periods. Besides, Bäckman and Khorunzhina (2017) and Almasifard and Saeedi (2017) also extend the identification of factors that affect household consumption rate in the economy. Bäckman and Khorunzhina (2017) examines the effect of financial innovation on house prices and consumption rate in Denmark for the period of 1996–2010. The results conclude that financial innovation increases house prices and consumption. However, Almasifard and Saeedi (2017) find different results. Specifically, fintech development, as measured with the ratio of outstanding M2 broad money to GDP even negatively affects consumption expenditure in Eastern European countries.

2. Research methods

The study uses quantitative data on household consumption and income. Besides, we also use the nominal data that indicates the beginning of Fintech 3.0 era (the year 2000). Further, the research relies on time-series data that ranges from 1990 to 2017. Specifically, our research data consists of household consumption data from the International Financial Statistic (IFS) and GDP data as the income data also from IFS.

2.1. Analysis technique

The study estimates the relationship between the consumption variable and income by referring to Keynes' consumption theory of absolute income hypothesis.

Specifically, the following function formulates the relationship between household consumption and income in Indonesia:

$$Cons_t = f(Y_t). \tag{3}$$

Function (3) above is specified in the following econometric equation:

$$Cons_t = \beta_0 + \beta_1 Y_t + \varepsilon_t, \tag{4}$$

where: $Cons_t$ is household consumption at period t ; Y_t is household income at period t ; β_0 is constant; β_1 is regression coefficient; ε_t is residual.

To answer our first question that asks whether Indonesia experiences the structural change of household consumption function as a consequence of fintech era 3.0 development, we use the Chow test. Before running this test, this study determines three household consumption models that represent three periods, namely: pre-fintech 3.0 development period, post-fintech 3.0 development period, and the combination of both periods.

The pre-fintech 3.0 development period.0 (1990–1999)

$$Cons_t = \alpha_0 + \alpha_1 Y_t + u_{1t}, n_1 = 10. \tag{5}$$

The post-fintech 3.0 development period (2000–2017)

$$Cons_t = \gamma_0 + \gamma_1 Y_t + u_{2t}, n_2 = 18. \tag{6}$$

The combination of both periods (1990–2017)

$$Cons_t = \sigma_0 + 3_1 Y_t + u_{2t}, n = n_1 + n_2 = 28. \tag{7}$$

The following are the stages of the Chow test (Gujarati, 2003):

1. Estimating equation (7) to generate the restricted residual sum of squares (RSS_R) value.
2. Estimating equation (5) and equation (6) to generate the unrestricted residual sum of squares (RSS_{UR}) value, where RSS_{UR} is generated by adding RSS_{UR} of equation (5) with RSS_{UR} of equation (6).
3. Calculating F value with the following formula:

$$F = \frac{(RSS_R - RSS_{UR}) / k}{(RSS_{UR}) / (n_1 + n_2 - 2k)} \sim F_{[k, (n_1 + n_2 - 2k)]}. \tag{8}$$

4. Comparing the value of F -statistic with F -table. If the F -statistic $>$ F -table, the alternative hypothesis (H_a) is supported (the structural change exists). However, if F -statistic $<$ F -table, the null hypothesis (H_0) is supported (the structural change does not exist).

2.2. Model specification

To answer the second research question that aims to investigate the short-term and long-term effects of the development of fintech 3.0 era on household consumption function in Indonesia, we use the partial adjustment model (PAM) regression. PAM is the rationalization of

Koyck's model as proposed by Mark Nerlove in 1958. Koyck's model is a simple one to estimate the relationships between dependent variable and independent variables that accommodate lag variables (Gujarati, 2003).

The model assumes that the expected values of the dependent variable (Y) in period t (Y_t^*) are directly unobservable. Thus, Y_t^* depends on actual independent variables (X_i) (Pindyck & Rubinfeld, 1997). The following is the mathematical formula of the model:

$$Y_t^* = \beta_0 + \beta_1 X_t + \mu_t, \tag{9}$$

where: Y_t^* = expected dependent variable; X_t = independent variables; μ_t = error.

The following econometric model formulates the relationships between consumption, income, and the development of fintech 3.0 era:

$$Cons_t^* = \beta_0 + \beta_1 Y_t + \beta_2 Dummy_t + u_t, \tag{10}$$

where: $Cons_t^*$ is the expected consumption rate; $Dummy_t$ is the dummy variable of the development of fintech 3.0 era.

The expected household consumption variable cannot directly be observed that we have to use the postulate of Nirlove or commonly known as the partial adjustment.

$$Cons_t - Cons_{t-1} = \delta(Cons_t^* - Cons_t), \tag{11}$$

where: $Cons_t - Cons_{t-1}$ is the actual change; $(Cons_t^* - Cons_t)$ is the expected change; δ is the coefficient of adjustment with the value of $0 < \delta \leq 1$. If its value is $\delta = 1$, then the actual consumption rate is equal to the expected consumption rate. The actual consumption rate will adjust the expected consumption rate quickly (at the same period). The adjustment mechanism can be formulated as follows:

$$Cons_t = \delta Cons_t^* + (1 - \delta) Cons_{t-1}. \tag{12}$$

Next, we substitute equation (9) into equation (11) to generate the following:

$$\begin{aligned} Cons_t &= \delta(\beta_0 + \beta_1 Y_t + \beta_2 Dummy_t + u_t) + \\ &(1 - \delta) Cons_{t-1} = \delta \beta_0 + \delta \beta_1 Y_t + \delta \beta_2 Dummy_t + \\ &(1 - \delta) Cons_{t-1} + \delta u_t. \end{aligned} \tag{13}$$

Equation (13) is commonly known as the partial adjustment model. Further, equation (10) indicates a long-term impact or an equilibrium condition, while equation (13) demonstrates a short-term effect.

If:

$$\begin{aligned} \pi_0 &= \delta \beta_0; \\ \pi_1 &= \delta \beta_1; \\ \pi_2 &= \delta \beta_2; \\ \pi_3 &= (1 - \delta); \\ \epsilon_t &= \delta u_t, \end{aligned}$$

then equation (13) can be simplified as follows:

$$Cons_t = \pi_0 + \pi_1 Y_t + \pi_2 Dummy_t + \pi_3 Cons_{t-1} + \epsilon_t. \tag{14}$$

We estimate equation (14) to test the effects of income and fintech 3.0 development on household consumption.

We use PAM due to the following. First, the partial adjustment coefficient of the dependent variable ($Cons_{t-1}$) exhibits meaningful economic meanings. Second, the coefficient also enables us to calculate the long-run response elasticity (Hendayana, 2005)

3. Results

We firstly run the Chow test to analyze the potential structural change in Indonesian household consumption functions as a consequence of fintech 3.0 development in the year 2000. The initial phase of the Chow test is estimating the regression model for the pre-fintech 3.0 period, the post-fintech 3.0 period, and both periods. The estimation of these three models generate an F value of 5.29 and error tolerance of 5%, and consequently, F-table value (2.23) is of 3.34. In this respect, F-stat is greater than F-table, thus implying that Indonesia experiences a structural change of household consumption function due to the development of fintech 3.0 era. The change of MPC value from the pre-fintech development period to the post-fintech period indicates the structural change of household consumption function where the coefficient value of the income variable (Y) in Table 1 is 1.072. The coefficient value is the MPC value of the pre-fintech development period, while the MPC value of the post-fintech 3.0 era is 1.023 (see Table 2).

MPC indicates the magnitude of the change in household consumption because of the change in income. The MPC value of the pre-fintech 3.0 development period is greater than the value of the pre-fintech period. The figures imply that in the fintech 3.0 era, the increase in consumption due to increased income becomes smaller. On the other hand, the development of fintech 3.0 will increase the marginal propensity to save (MPS) or additional savings due to increased income. Theoretically, the

Table 1. The results of estimating household consumption model in Indonesia for the pre-fintech 3.0 development period (1990–1999)

Dependent Variable: Cons				
Sample: 1990–1999				
Variable	Coefficient	Std. Error	t-statistic	Prob
Constant	-0.091293	0.084141	-1.084995	0.3095
Y	1.071958	0.015151	70.75124	0.0000
R-squares		: 0.998404		
Adjusted R-squared		: 0.998205		
Sum Squared Residual		: 0.131190		
F-statistic		: 5005.738		

Table 2. The results of estimating household consumption model in Indonesia for the post-fintech 3.0 development period (2000–2016)

Dependent Variable: Cons				
Sample: 2000–2017				
Variable	Coefficient	Std. Error	t-statistic	Prob
Constant	0.842593	0.230565	3.654465	0.0023
Y	1.023491	0.003520	290.7347	0.0000
R-squares		: 0.999823		
Adjusted R-squared		: 0.999811		
Sum Squared Residual		: 3.986070		
F-statistic		: 84526.69		

addition of the MPC value and the MPS value equals to one ($MPC + MPS = 1$). The results suggest that fintech development facilitates households to save their financial assets and eventually to increase their savings. Fintech development creates peer-to-peer (P2P) lending fintech that facilitates online lending or borrowing. The population borrowed from P2P lending fintech increased in 2018, as indicated by increased number of P2P borrowers' accounts (Figure 1).

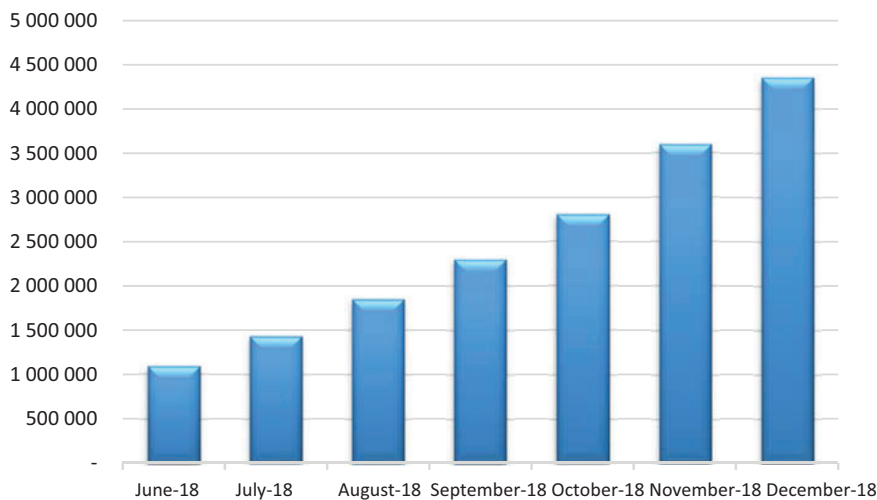


Figure 1. The development of Indonesian P2P Fintech borrowers' accounts in 2018 (source: Financial Services Authority (processed) (Otoritas Jasa Keuangan, 2019))

Increased P2P fintech borrowers' accounts also enables the public to earn profits from lending to P2P fintech. Consequently, income portion devoted to savings will increase and consumption will decrease. In other words, fintech will reduce MPC and increase MPS.

The results are in line with Becker (2017) who empirically finds that fintech development positively affects household savings. However, both the MPC values of the pre- and post-fintech 3.0 are greater than one. The results support Alimi (2013) and indicate that other factors affect household consumption rate in Indonesia.

Next, we estimate the household consumption function model with the partial adjustment model to examine the impact of fintech 3.0 development on Indonesian household consumption rate both in the short-term and long-term.

Table 3. The results of estimating short-term household consumption model in Indonesia

Dependent variable: Cons				
Sample: 1990–2016				
Variable	Coefficient	Std Error	t-Statistic	Prob
C	0.184370	0.143250	1.287046	0.2115
Y	0.958969	0.046326	20.70061	0.0000
Cons(-1)	0.068180	0.048745	1.398688	0.1758
Dummy	0.764568	0.233592	3.273096	0.0035
R-squared	0.999897			
Adjusted R-squared	0.999883			
Sum squared resid	3.926101			
F-statistic	71472.12			

Table 3 above indicates that the income factor exhibits a significant effect on household consumption rate in Indonesia. Specifically, the coefficient value of the income variable as the marginal propensity to consume is 0.96. The value implies that when the income factor increases by one million rupiahs, consumption will increase by 0.96 million rupiahs. In other words, almost all the increase in income is allocated to consumption, and only a small

portion of the increase is used to increase savings. The results are similar to Arioglu (2011), Ofwona (2013), and Zafar (2016) who find that income is the main determining factor of consumption.

Fintech development as the dummy variable positively affects household consumption rate in Indonesia. The results are in line with Agarwal et al. (2019), Agarwal and Chua (2020), Li et al. (2020), Bäckman and Khorunzhina (2017), Agarwal et al. (2020) who document the effect of fintech on household consumption. In the short run, the coefficient value of the fintech development dummy is 0.76, indicating that, ceteris paribus (household income is assumed to be constant), the development of fintech 3.0 will increase household consumption by 0.76 million rupiahs. Increased consumption in the post-fintech period is likely caused by the ability of fintech development to facilitate households to make transactions more easily. For example, the presence of mobile banking will increase online sales and fintech development simplify payments through mobile banking, internet banking and e-money. These transaction facilities will arguably enhance household consumption.

Figure 2 illustrates the increased used of e-money in Indonesia. As a form of fintech development, e-money simplifies transactions that will increase household consumption expenditures. Similarly, digital payment development in India reduces cash payments (Agarwal et al., 2019). Mobile payment as a form of fintech development also reduces cash withdrawals through ATM in Singapore. In this respect, mobile payment reduces transaction costs and increases consumption expenditures (Agarwal et al., 2020).

Further, the CONS(-1) variable also significantly affects household consumption with the coefficient value of 0.068180. The results suggest that the value of the coefficient of adjustment (δ) as formulated in equation (10) is $(1 - 0.068180) = 0.93182$. Thus, the findings imply that 93.182% of the discrepancy between the actual consumption rate and the expected consumption rate will diminish in one year.

The use of partial adjustment model enables us to analyze the long-term effect of fintech development on

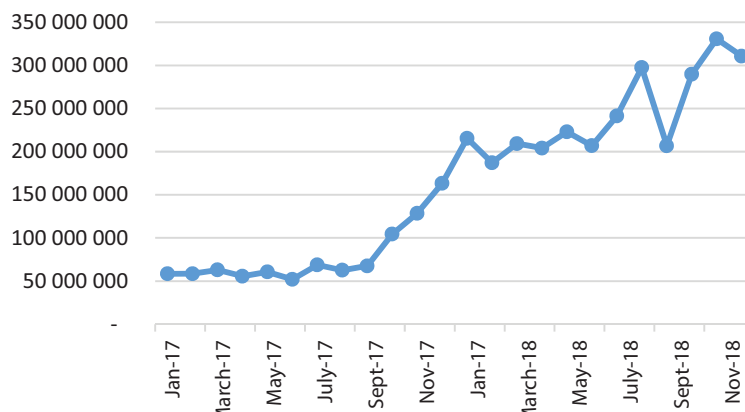


Figure 2. Number of e-money transactions in Indonesia, 2017–2018 (transaction units) (source: Bank Indonesia, 2018b)

Indonesian household consumption rate. Specifically, the partial adjustment model estimates the long-term consumption model by dividing all coefficients in the short-term model with the coefficients of adjustment (δ) as presented by Table 4 below.

Table 4. The computation of long-term coefficient of the Household Consumption Model in Indonesia

Variable	Short-term Coefficient	The Coefficient of Adjustment	Long-term Coefficient
Constant	0.184370	0.93182	0.19786
Y	0.958969	0.93182	1.029135
Dummy	0.764568	0.93182	0.82051

Table 4 shows that the long-term effect of fintech development on household consumption rate in Indonesia is greater than the short-term effect in the same direction. In the long run, where every economic actor has perfect information, more people will appreciate fintech development and fintech's benefits. Consequently, they will use fintech more frequently in their economic transactions and the long-run effect of fintech on household consumption is greater.

However, in the long run, the MPC (marginal propensity to consume) value is greater than one, indicating that in the long run, other factors besides income that affect Indonesian household consumption rate. Overall, our results are in line with (Alimi, 2013).

Conclusions

The results conclude that fintech 3.0 development that started in the 2000s leads to the structural change of Indonesian household consumption function as indicated by the pre-fintech 3.0 MPC value that is greater than the post-fintech 3.0 MPC value. The figures suggest that fintech increases household wealth because the MPC value decreases. The fintech 3.0 development in Indonesia has both short-term and long-term effects on increased household consumption. On the one hand, the findings are a positive signal to rely on fintech as the factor that encourages economic growth in Indonesia (Aziz & Athillah, 2020; Deng et al., 2019). On the other hand, the results indicate that fintech motivates the public to be more consumptive that will potentially lead to higher inflation rates. Thus, our study suggests that policymakers include the fintech development variable in modeling Indonesian inflation to achieve the inflation target. Besides, the government's policies to provide sufficient infrastructure will likely lessen the potentials of increased inflation rate due to fintech development (Saraswati et al., 2020).

Our results also indicate that fintech development enables household income to remain the main variable that affects consumption. However, the portion of income for consumption is affected by financial technology. In this respect, fintech will affect the marginal propensity to consume. Financial technology enables households to access

financial services, such as lending, payments, or investments. Fintech-facilitated lending will increase household consumption (Ji et al., 2020). Similarly, online shopping, digital payment, and business insurance affect household consumption (Li et al., 2020b). Besides, fintech development provides opportunities to increase households' permanent income. As suggested by the permanent consumption income hypothesis, increases in permanent income will eventually affect consumption. This study operationalizes the fintech variable as a dummy one (before and after fintech 3.0). We advise future studies to use the fintech lending and fintech payments variables as the fintech development indicator that will arguably offer more nuanced perspectives of the impact of fintech on consumption patterns.

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Author contributions

Birgitta Dian Saraswati conceived the study and was responsible for the design, data collection and development of the data analysis. Ghozali Maski, David Kaluge and Rachmad Kresna Sakti were responsible for data interpretation and discussion. Birgitta Dian Saraswati wrote the first draft of the article.

Disclosure statement

Authors declare that there is no conflict of interest.

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