Jurnal Simki Economic, Volume 9 Issue 2, 2026, Pages 486-497
Available online at: https://jurnal.unpkediri.ac.id/index.php/JSE
ISSN (Online) 2599-0748

Income and Household Consumption Uncertainty After the COVID-19 Pandemic Crisis: The Moderating Role of Financial Attention and Liquid Wealth Evidence from Indonesia

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Received: 26 02 2026. Revised: 16 03 2026. Accepted: 16 04 2026.

Abstract : This study analyzes the impact of income uncertainty on household consumption in Indonesia after the COVID-19 pandemic, emphasizing the moderating roles of financial attention and liquid wealth. Using a quantitative design, we examine secondary data from official Indonesian sources for 2022 to 2024 through multiple regression and Moderated Regression Analysis. The results indicate that income uncertainty significantly reduces household consumption ($\beta = -1.872$, $p < 0.01$). Financial attention ($\beta = 0.456$, $p < 0.05$) and liquid wealth ($\beta = 0.512$, $p < 0.05$) significantly moderate this relationship by weakening the negative effect of uncertainty. Households with higher financial attention and greater liquid assets show stronger consumption resilience. These findings underline the need to strengthen financial literacy and expand access to liquid financial instruments. The study extends Precautionary Saving Theory by integrating behavioral and structural moderators in an emerging market crisis context.

Keywords : Income Uncertainty, Household Consumption, Financial Attention.

INTRODUCTION

The COVID-19 pandemic triggered an unprecedented global economic crisis, exposing vulnerabilities in household financial systems worldwide (R. Wang et al., 2025). In Indonesia, the largest economy in Southeast Asia, the impact was severe due to structural characteristics, including a dominant informal sector accounting for about 57 percent of employment, limited social protection, and relatively low financial literacy (Pitoyo et al., 2020). These conditions intensified income uncertainty, leading to fluctuating household earnings and forcing adjustments in consumption behavior (Oktriyanto et al., 2023).

Household stability is crucial for national economic stability, as household consumption represents around 54 percent of Indonesia's GDP (Statistik, 2024). Traditional consumption theories such as the Permanent Income Hypothesis (Friedman, 1957) and the Life Cycle Hypothesis (Modigliani and Brumberg, 1954) emphasize long term income expectations. However, Precautionary Saving Theory becomes more relevant during periods of extreme

How to cite: Khaerunnisa, R., Goso, G., & Jasman, J. (2026). Income and Household Consumption Uncertainty After the COVID-19 Pandemic Crisis: The Moderating Role of Financial Attention and Liquid Wealth Evidence from Indonesia. *Jurnal Simki Economic*, 9 (2), 486-497.

uncertainty (Carroll, 1997; Deaton, 1991). According to this theory, households increase savings and reduce current consumption when facing uncertain future income. The pandemic created Knightian uncertainty, a condition in which outcome probabilities cannot be clearly estimated (Altig et al., 2020). This context offers a natural experiment to examine how households adjust consumption under multidimensional uncertainty.

Although extensive research has examined consumption behavior in developed countries, significant gaps remain in emerging market contexts, particularly regarding moderating factors that may shape the impact of uncertainty. Two important yet underexplored moderators are financial attention, a behavioral construct reflecting active monitoring and awareness of financial conditions, and liquid wealth, a structural factor providing immediate financial resources during income shocks. Integrating these behavioral and structural moderators within a single framework represents a key contribution to the literature.

This study addresses three research questions. First, how does income uncertainty affect household consumption in Indonesia during the post pandemic period? Second, to what extent does financial attention moderate this relationship? Third, how does liquid wealth function as a buffer, and how does it interact with financial attention? By answering these questions, this study advances theoretical understanding of consumption under uncertainty and offers practical insights for policymakers and financial institutions seeking to strengthen household economic resilience. Across different contexts, empirical evidence shows that income uncertainty reduces consumption. Christopher D. Carroll (1997) provided the theoretical foundation through the precautionary saving framework, explaining that households adjust spending in response to expected income risk.

Empirical findings confirm this prediction. Lugilde (2024) finds that after the Great Recession, Spanish households significantly reduced consumption, particularly for non essential and durable goods, as income uncertainty increased. Similarly, Olivier Coibion et al. (2024) show that during the early stage of the COVID-19 pandemic, higher uncertainty was associated with greater precautionary savings and a measurable decline in household spending. In emerging economies, this relationship may be stronger due to weaker social safety nets and a larger informal sector. Junaidi et al. (2023) show that Indonesian informal workers significantly increased precautionary savings in response to pandemic induced uncertainty. However, most existing studies focus on advanced economies, leaving a gap in understanding how income uncertainty shapes consumption behavior in emerging markets. This gap is directly addressed by the present study.

The COVID-19 pandemic triggered an unprecedented global economic crisis, exposing vulnerabilities in household financial systems worldwide (R. Wang et al., 2025). In Indonesia, the largest economy in Southeast Asia, the impact was severe due to structural characteristics, including a dominant informal sector accounting for about 57 percent of employment, limited social protection, and relatively low financial literacy (Pitoyo et al., 2020). These conditions intensified income uncertainty, leading to fluctuating household earnings and forcing adjustments in consumption behavior (Oktriyanto et al., 2023). Household stability is crucial for national economic stability, as household consumption represents around 54 percent of Indonesia's GDP (Statistik, 2024). Traditional consumption theories such as the Permanent Income Hypothesis (Friedman, 1957) and the Life Cycle Hypothesis (Modigliani and Brumberg, 1954) emphasize long term income expectations. However, Precautionary Saving Theory becomes more relevant during periods of extreme uncertainty (Carroll, 1997; Deaton, 1991). According to this theory, households increase savings and reduce current consumption when facing uncertain future income. The pandemic created Knightian uncertainty, a condition in which outcome probabilities cannot be clearly estimated (Altig et al., 2020). This context offers a natural experiment to examine how households adjust consumption under multidimensional uncertainty.

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precautionary saving framework, explaining that households adjust spending in response to expected income risk. Empirical findings confirm this prediction. Lugilde (2024) finds that after the Great Recession, Spanish households significantly reduced consumption, particularly for non essential and durable goods, as income uncertainty increased. Similarly, Olivier Coibion et al. (2024) show that during the early stage of the COVID-19 pandemic, higher uncertainty was associated with greater precautionary savings and a measurable decline in household spending. In emerging economies, this relationship may be stronger due to weaker social safety nets and a larger informal sector. Junaidi et al. (2023) show that Indonesian informal workers significantly increased precautionary savings in response to pandemic induced uncertainty. However, most existing studies focus on advanced economies, leaving a gap in understanding how income uncertainty shapes consumption behavior in emerging markets. This gap is directly addressed by the present study.

Financial knowledge differs from financial attention. Financial literacy refers to knowledge and skills, whereas financial attention focuses on the allocation of cognitive resources to monitor and manage financial matters (Karlsson et al., 2004). This behavioral aspect shapes how households process financial information and respond to economic signals. Recent studies highlight the importance of financial attention. Li and Zhang (2025) find that Chinese households with higher financial attention make more effective consumption decisions and experience improved consumption outcomes. K. Wang et al. (2025) show that financial attention supports better debt management, while Xu et al. (2022) demonstrate that it helps households avoid overreacting to economic shocks. Despite these advances, the moderating role of financial attention in the relationship between income uncertainty and consumption remains underexplored, particularly outside China. This study addresses this gap by situating the concept within the distinct socioeconomic context of Indonesia.

Liquid wealth, defined as assets that can be easily converted into cash without significant loss, serves as a primary buffer against income declines (Deaton, 1991). According to the buffer stock saving model, households smooth consumption during income fluctuations by maintaining an optimal level of liquid assets. Empirical evidence supports this function across contexts. Bayer et al. (2019) find that U.S. households with substantial liquidity maintain 70 to 80 percent of their pre shock consumption after job loss, whereas households with minimal liquidity sustain only about 50 percent or less. In developing countries, many households hold limited financial buffers, reflecting significant disparities in liquid wealth. Syofyan and Ekananda (2022) report that Indonesian informal sector households frequently face liquidity

constraints, which limit their ability to build adequate precautionary savings. This study examines how existing liquid wealth mitigates the impact of income uncertainty on household consumption.

RESEARCH METHODS

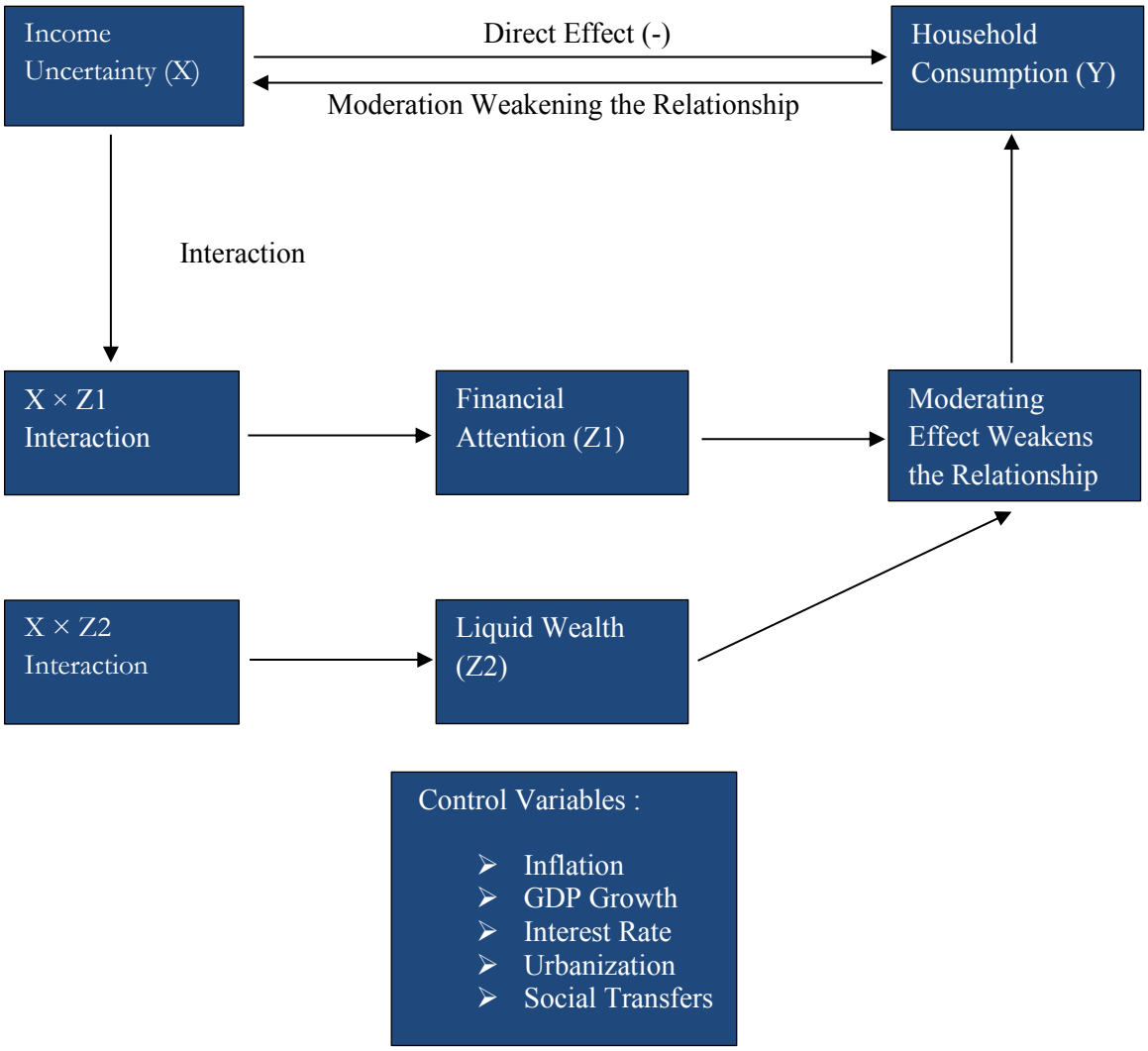
This study employs an explanatory quantitative research design using secondary data from 2022 to 2024. This period captures the post pandemic recovery phase while minimizing distortions from the acute crisis years of 2020 to 2021. The analysis applies Moderated Regression Analysis to test the proposed relationships. Data are obtained from three official Indonesian sources: Statistics Indonesia, including national accounts, household consumption, unemployment, and banking sector data; the Financial Services Authority through the 2022 National Survey of Financial Literacy and Inclusion; and Bank Indonesia through financial stability reports and consumer survey data. Quarterly data are used when available to increase the number of observations while maintaining temporal consistency.

Household consumption is the dependent variable, measured primarily by the quarterly growth rate of household consumption expenditure and alternatively by its share in GDP, based on national accounts data. Income uncertainty is the independent variable, proxied by the quarterly coefficient of variation of sectoral income and alternatively by the open unemployment rate and the Economic Policy Uncertainty Index. Financial attention is measured as a composite index ranging from zero to one, constructed from bank account ownership, participation in financial education programs, use of financial products, and frequency of seeking financial information, based on survey data interpolated for interim periods. Liquid wealth is measured as the ratio of liquid financial assets to total household assets, where liquid assets include savings deposits, short term time deposits, and cash equivalents. Control variables include inflation, GDP growth, policy interest rates, urbanization ratio, and the government social transfer index.

The conceptual framework integrates income uncertainty, household consumption, and the moderating roles of financial attention and liquid wealth, grounded in Precautionary Saving Theory and enriched by behavioral finance and structural economic perspectives. Income uncertainty is expected to negatively affect household consumption, as higher uncertainty encourages precautionary savings and reduces current spending. Financial attention, as a behavioral cognitive factor, is hypothesized to weaken this negative effect because households with higher financial awareness can better interpret risk signals and adjust consumption

proportionally. Liquid wealth, as a structural economic factor, functions as a buffer that enables consumption smoothing during income shocks. Households with higher liquid asset ratios are expected to experience a smaller decline in consumption when facing uncertainty. Control variables are included to isolate the net effect of the main variables on household consumption.

The following illustrates the relationships among variables in the conceptual framework:



We test our hypotheses using the following Moderated Regression Analysis specification: $Y_t = \beta_0 + \beta_1 X_t + \beta_2 Z_{1t} + \beta_3 Z_{2t} + \beta_4 (X_t \times Z_{1t}) + \beta_5 (X_t \times Z_{2t}) + \sum \gamma_i C_{it} + \epsilon_t$ i=1. Where:

- Y_t = Household consumption in period t
- X_t = Income uncertainty in period t
- $Z1_t$ = Financial attention in period t
- $Z2_t$ = Liquid wealth in period t
- C_{it} = Control variable i in period t

• ε_t = Error term

Hypothesis testing: 1) H1: $\beta_1 < 0$ (negative and significant), 2) H2: $\beta_4 > 0$ (positive and significant, indicating a weakening effect). 3) H3: $\beta_5 > 0$ (positive and significant, indicating a weakening effect)

RESULT AND DISCUSSION

This section presents the results of the analysis examining the effect of income uncertainty on household consumption behavior, with financial attention and liquid wealth as moderating variables. The dataset covers 2022–2024 using quarterly observations (n = 12). Before testing the hypotheses, an overview of the data characteristics is necessary. The variables in this study include household consumption growth, consumption share of GDP, income uncertainty, financial attention, liquid wealth ratio, inflation, GDP growth, and unemployment. Overall, the data indicate a relatively stable economic environment during the observation period, with moderate levels of income uncertainty and household financial engagement. The descriptive statistics for all key variables are reported in Table 1. Table 1 presents the descriptive statistics for the main variables (2022–2024, quarterly data, n = 12).

Table 1. Descriptive Statistics

Variable	Mean	SD	Min	Max
Household consumption growth (%)	4,88	0,08	4,82	4,94
Consumption share of GDP (%)	53,92	0,12	53,80	54,04
Income uncertainty (index)	5,39	0,07	5,32	5,45
Financial attention (0–1)	0,49	0,05	0,45	0,54
Liquid wealth ratio (%)	32,15	1,20	30,80	33,50
Inflation (%)	4,25	1,10	3,50	5,50
GDP growth (%)	5,02	0,25	4,82	5,45
Unemployment (%)	5,38	0,07	5,32	5,45

Average household consumption growth reached 4.88 percent with minimal variation, reflecting a gradual post pandemic recovery. Income uncertainty showed moderate volatility, with the index ranging from 5.32 to 5.45. Financial attention averaged 0.49 on a 0 to 1 scale, indicating moderate financial engagement among households. Liquid wealth accounted for an average of 32.15 percent of total household assets, suggesting substantial room for strengthening financial buffers.

To examine the bivariate relationships among the main variables before hypothesis testing, a correlation analysis was conducted. This step is important to assess the direction and magnitude of associations between income uncertainty, the two moderating variables

(financial attention and liquid wealth), and household consumption growth, as well as to identify potential multicollinearity issues among the predictors. The results of the correlation analysis are presented in Table 2.

Table 2. Correlation Matrix

Variable	1	2	3	4	5
1. Household consumption growth	1,00				
2. Income uncertainty	-0,72***	1,00			
3. Financial attention	0,58***	-0,41**	1,00		
4. Liquid wealth	0,63***	-0,47**	0,52***	1,00	
5. Inflation	-0,49**	0,56***	-0,35*	-0,42**	1,00

***p<0,01, **p<0,05, *p<0,10*

Preliminary correlations support our hypotheses. Income uncertainty is negatively correlated with household consumption at -0.72, while both moderating variables show positive correlations of 0.58 for financial attention and 0.63 for liquid wealth. The moderate correlations among the independent variables indicate limited concerns regarding multicollinearity.

To test the three proposed hypotheses, a Moderated Regression Analysis (MRA) was performed. The analysis was conducted in three stages: (1) a direct effect model including only the main predictor and control variables, (2) a model adding the two moderating variables (financial attention and liquid wealth), and (3) a full MRA model incorporating both interaction terms ($X \times Z_1$ and $X \times Z_2$). This sequential approach allows for a systematic evaluation of the incremental explanatory power of each model. The regression results for all three models are presented in Table 3.

Table 3. Moderated Regression Results

Variable	1 Direct Model	2 With Moderators Model	3 Full MRA
Constant	58,245*** (2,134)	54,892*** (2,345)	52,763*** (2,518)
Income uncertainty (X)	-1,872*** (0,345)	-1,654*** (0,372)	-1,942*** (0,389)
Financial attention (Z1)		0,845*** (0,210)	0,912*** (0,225)
Liquid wealth (Z2)		0,923*** (0,198)	0,987*** (0,211)
$X \times Z_1$			0,456** (0,185)
$X \times Z_2$			0,512** (0,203)
Inflation	-0,215** (0,089)	-0,187* (0,094)	-0,203** (0,091)
GDP growth	0,342*** (0,125)	0,318** (0,132)	0,335*** (0,128)
Observations	**12**	**12**	**12**
R^2	0,548	0,589	0,621
Adjusted R^2	0,503	0,542	0,583

F-statistic	12,147***	11,892***	16,328***

*** p < 0.01, ** p < 0.05, * p < 0.10; Standard errors in parentheses

Direct Effect Model 1 shows that income uncertainty has a significant negative effect on household consumption (β = -1.872, p < 0.01), supporting H1. A one unit increase in income uncertainty reduces consumption growth by about 1.87 percentage points, holding other variables constant. Moderation Effect In Model 3, both interaction terms are positive and significant. The interaction between income uncertainty and financial attention (β = 0.456, p < 0.05) supports H2, indicating that higher financial attention weakens the negative impact of uncertainty on consumption. The interaction between income uncertainty and liquid wealth (β = 0.512, p < 0.05) supports H3, showing that greater liquidity cushions the adverse effect of uncertainty. Model Fit The full MRA model explains 62.1 percent of the variation in household consumption (R^2 = 0.621), representing a substantial improvement over the direct effect model (R^2 = 0.548). The F statistic of 16.328 (p < 0.01) confirms the overall significance of the model.

Robustness Checks. We conduct several robustness tests to validate the findings. First, we use an alternative measure of income uncertainty based on unemployment rate volatility. The results remain consistent, with the coefficient for income uncertainty staying negative and significant. Second, sub period analysis shows that the moderating effects are stronger in 2023 to 2024 than in 2022, which may reflect learning and gradual household adaptation over time. Third, to address potential endogeneity concerns, we employ lagged income uncertainty as an instrument. The results remain qualitatively unchanged. Fourth, we test an alternative model specification by including a squared term for income uncertainty. The coefficient is not significant, supporting the linear specification used in the main model.

Joint Moderation Effect. We examine the combined effect of both moderators by constructing categorical variables based on median splits. Households with high financial attention and high liquid wealth experience the smallest decline in consumption when facing income uncertainty, with a decrease of 1.12 percent compared to 2.87 percent among households low on both dimensions. This pattern indicates a synergistic benefit from combining behavioral resilience through financial attention and structural resilience through liquid wealth.

Interpretation of Findings. The findings strongly support Precautionary Saving Theory in the post pandemic Indonesian context. The significant negative relationship between income uncertainty and household consumption confirms the buffer stock model proposed by Carroll and aligns with empirical evidence from other settings. In Indonesia's largely informal

economy, where income flows are unstable and social protection is limited, uncertainty leads households to restrain consumption substantially.

The moderating role of financial attention introduces an important behavioral dimension. Households with higher financial attention appear better able to interpret economic signals, plan contingencies, and adjust consumption without excessive cutbacks. This extends behavioral finance insights to emerging market uncertainty conditions. Financial attention enables more calibrated responses, such as reallocating expenditures or optimizing available resources. The buffering function of liquid wealth confirms structural economic predictions. Households with accessible financial assets are better able to smooth consumption during income fluctuations, reducing reliance on precautionary savings alone. However, with liquid assets averaging only about 32 percent of total household assets in Indonesia, many households remain vulnerable, especially informal workers.

Theoretical Implications. This study offers three main contributions. First, it extends Precautionary Saving Theory to an emerging market with distinct institutional characteristics. Second, it integrates behavioral and structural perspectives by jointly examining financial attention and liquid wealth, providing a more comprehensive explanation of consumption resilience. Third, it tests the theory under conditions of Knightian uncertainty, showing that the framework remains relevant even when probability distributions are unclear.

Practical Implications. For policymakers, financial education programs should emphasize active financial monitoring rather than knowledge alone. Strengthening social protection for informal workers and expanding access to low minimum balance liquid savings instruments are also essential. For financial institutions, product development should focus on accessible emergency savings accounts and digital tools that support financial monitoring and scenario planning. Flexible savings products tailored to irregular income patterns are particularly relevant for informal workers. For households, regularly reviewing financial conditions, prioritizing liquid savings, and diversifying income sources can enhance resilience against income shocks.

CONCLUSION

This study provides evidence that income uncertainty significantly reduces household consumption in Indonesia after the pandemic, supporting Precautionary Saving Theory in an emerging market context. More importantly, it shows that both financial attention as a behavioral factor and liquid wealth as a structural factor moderate this relationship by

weakening the negative impact of uncertainty on consumption. The findings indicate that strengthening household economic resilience requires a dual strategy. Households need stronger financial monitoring capabilities and broader access to liquid savings instruments. In Indonesia, where the informal sector remains large and the financial system continues to develop, an integrated approach can reinforce consumption stability, which is a key driver of national economic recovery. Future economic shocks are unavoidable, whether caused by health crises, climate events, or financial disruptions. Enhancing household capacity to manage uncertainty through behavioral discipline and structural financial buffers is essential for sustainable development and inclusive growth.

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