

Financial Wellbeing of Poor Households in Eastern Indonesia: Role of Digital Financial Inclusion

Maria Oktaviani Lede¹, Yohanes Rafael Benu², Daniel Putra Nggili³

Universitas Nusa Cendana, Kupang, Indonesia

Email: oktaviani_lede@gmail.com



ABSTRACT

This study examines the determinants of financial wellbeing among poor households in Eastern Indonesia, with particular emphasis on the mediating role of digital financial inclusion. Focusing on East Nusa Tenggara (NTT) and West Nusa Tenggara (NTB), the study addresses the persistent financial vulnerability of poor households living in regions characterized by high poverty, limited formal financial access, and uneven digital infrastructure. Primary survey data were collected from 405 poor households whose income fell below the provincial poverty line, consisting of 248 respondents from NTT and 157 respondents from NTB. The data were analyzed using partial least squares structural equation modeling (PLS-SEM), followed by multigroup analysis to compare provincial differences. The findings show that financial behavior, financial literacy, and digital financial inclusion have significant positive effects on household financial wellbeing. However, digital literacy, digital financial service infrastructure, and financial service providers do not directly affect financial wellbeing. Instead, digital financial inclusion fully mediates the effects of infrastructure and financial service providers on financial wellbeing. The multigroup analysis reveals that digital financial inclusion has a stronger impact on financial wellbeing in NTT, while infrastructure and financial service providers have stronger effects on digital financial inclusion in NTB. These results highlight the importance of strengthening digital financial inclusion as a strategic pathway to improve the financial wellbeing of poor households. Policy interventions should prioritize financial education, affordable digital financial products, reliable digital infrastructure, and locally adapted financial services for underserved communities in Eastern Indonesia.

Keywords: Financial Wellbeing, Poor Households, Digital Financial Inclusion, Financial Literacy, PLS-SEM, Eastern Indonesia

INTRODUCTION

Poverty remains one of the most persistent challenges in developing nations, defined by the World Bank as a pronounced deprivation in wellbeing (A. D. Bank, 2017; Fan & Henager, 2022). Poor households are financially vulnerable due to limited financial resources, uncertain employment, and an inability to recover from unexpected financial shocks (Lyons & Kass-Hanna, 2021). Access to financial services is widely recognized as a critical factor in poverty reduction, as excluded populations often face difficulty saving, investing, and building assets to protect against risks. Financial inclusion represents one of the primary mechanisms through which vulnerable groups may enhance their financial wellbeing and escape poverty cycles. Financial inclusion encompasses accessibility to financial products and services that are useful, affordable, and meet financial needs, including savings, payments, credit, and insurance, delivered responsibly and sustainably (The World Bank 2022). Financial wellbeing, in turn, reflects an individual's ability to fulfill ongoing financial commitments, remain resilient to income shocks, achieve future financial goals, and make financial decisions that enhance overall quality of life (OJK 2023).

The rapid proliferation of digital financial services has introduced new pathways toward achieving financial inclusion and reducing poverty (OECD, 2018) (Zhou & Wang 2021). Digital technology enables alternative data sources, including smartphone usage, e-commerce activity, transaction history, and social media engagement, to be leveraged for assessing creditworthiness and delivering customized financial services (Asian Development Bank 2017; OECD 2022). The deployment of digital financial services such as mobile banking, internet banking, and electronic wallets addresses traditional barriers of physical accessibility, transaction costs, and geographic remoteness, thereby holding the potential to achieve higher levels of financial wellbeing among underserved populations (OECD 2016). Digital financial inclusion is defined as the

access and use of formal financial services by excluded and underserved populations through digital channels, at affordable costs, and in ways that meet their needs (CGAP 2015).

Indonesia presents a compelling context for examining digital financial inclusion and household financial wellbeing. According to the Otoritas Jasa Keuangan (OJK) National Financial Literacy and Inclusion Survey (SNLIK) 2024, the national financial inclusion index reached 75.02 percent, while the financial literacy index stood at 65.43 percent (OJK 2024). However, significant disparities persist between urban and rural areas, with rural financial inclusion at 70 percent compared to 78 percent in urban areas (Yulyanah, 2023; Zhou & Wang, 2021). Internet access, while reaching 79.5 percent nationally according to the Indonesian Internet Service Providers Association (APJII 2024), remains unequally distributed, with eastern Indonesian provinces such as NTT and NTB facing higher internet costs, limited connectivity, and significantly lower digital infrastructure compared to western Indonesia (T. W. Bank, 2020)(Freedom House 2024).

The provinces of East Nusa Tenggara (NTT) and West Nusa Tenggara (NTB) are among the most impoverished in Indonesia. According to Badan Pusat Statistik (BPS 2024), NTT recorded a poverty rate of 19.96 percent in March 2024, making it among the three poorest provinces in the country, while NTB recorded a poverty rate of 12.91 percent during the same period. Both figures are substantially above the national average of 9.03 percent (BPS 2024). The household poverty line in NTT stood at Rp 3,102,215 per month as of September 2024, with an average household size of 5.81 members (Keuangan, 2023)(BPS 2024). These provinces share characteristics of high rural populations, dependence on primary sectors such as agriculture and fishery, low levels of education, limited access to formal financial institutions, and inadequate digital infrastructure, all of which compound financial vulnerability (Omar & Inaba, 2020; Ozili, 2020; Polloni-Silva et al., 2021)(Yulyanah 2023).

Despite the urgent relevance of these conditions, research on financial wellbeing specifically targeting poor households in eastern Indonesia remains limited. Most studies on financial wellbeing have concentrated on psychological determinants such as financial behavior, financial knowledge, and financial stress (Rahman et al. 2021; Mahdzan et al. 2023), with insufficient attention to the structural and systemic factors of digital financial service infrastructure and financial service providers (Muir et al., 2017; Nandru et al., 2021; Neaime & Gaysset, 2018)(OECD, 2018). Moreover, the role of digital financial inclusion as a mediating mechanism in this context has received negligible empirical scrutiny (Aziz & Naima 2021; Zhou & Wang 2021). The absence of a unified framework incorporating both household-level and financial system-level factors further limits the depth of existing understanding (Kabadayi & O'Connor 2019; Rahman et al. 2021).

This study aims to examine the determinants of financial wellbeing for poor households in NTT and NTB and to investigate the mediating role of digital financial inclusion. Partial least squares structural equation modeling (PLS-SEM) is employed to analyze primary survey data. The contributions of this study are threefold. First, it expands the financial wellbeing literature by simultaneously incorporating household-level factors, namely financial behavior, financial literacy, and digital literacy, alongside financial system-level factors, namely digital financial service infrastructure and financial service providers, within a single integrated framework. Second, it focuses on households whose income falls below the provincial poverty line, a subset of the poor population that encounters unique and compounded financial challenges. Third, through PLS multigroup analysis (PLS-MGA), this study provides an empirical comparison between NTT and NTB, illuminating provincial-level differences in the determinants of financial wellbeing and offering targeted insights for policymakers in each province.

LITERATURE REVIEW

Financial Wellbeing

Financial wellbeing (FWG) has attracted growing scholarly attention but continues to lack a universally agreed conceptual definition (A. D. Bank, 2017; Hair et al., 2018)(Sehrawat et al. 2021) and a standardized measurement framework (Kabadayi & O'Connor 2019; Rahman et al. 2021; Mahdzan et al. 2023). It can be categorized as objective or subjective. Objective financial wellbeing refers to measurable financial resources such as income, assets, and liabilities, whereas subjective financial wellbeing is determined by an individual's perceptions of and satisfaction with their financial situation (Kass-Hanna et al., 2022; Zhou & Wang, 2021).

This study operationalizes financial wellbeing in subjective terms, assessing satisfaction with financial services, the ability to meet financial commitments, and improvements in living standards. Subjective financial wellbeing provides a more precise reflection of individual financial circumstances, as it originates from personal

experiences and encompasses both cognitive and affective dimensions of life satisfaction (Abid & Mohd Shafiai, 2018; Vaid et al., 2020). Past research has documented significant positive associations between financial wellbeing and financial literacy, financial behavior, and financial inclusion (Rahman et al. 2021; Selvia et al. 2021; Mahdzan et al. 2023). Among poor households, these relationships are particularly salient given the precarity of financial resources and the chronic exposure to economic shocks (Lee et al., 2020; Mahdzan et al., 2023).

Relationship Between Financial Behavior and Financial Wellbeing

Financial behavior (FBR) encompasses the range of actions individuals undertake to manage their finances, including budgeting, maintaining emergency funds, saving before spending, and establishing financial goals (Morgan & Long 2020). Empirical evidence consistently demonstrates that higher levels of FBR are associated with improved financial wellbeing. Rahman et al. (2021) found FBR to be the strongest predictor of financial wellbeing among urban poor households in Malaysia, noting that sound financial behavior enhances the capacity to manage financial stress and secure financial stability. Similarly, Sehwat et al. (2021) and Mahdzan et al. (2023) confirmed significant positive effects of FBR on FWG across diverse income groups. Among poor households specifically, disciplined spending behavior, record-keeping, and proactive savings are expected to yield measurable improvements in financial wellbeing. Based on these considerations, this study hypothesizes:

H1: The FBR of poor households in NTT and NTB has a significant positive impact on FWG.

Relationship Between Financial Literacy and Financial Wellbeing

Financial literacy (FILT) is defined by the OECD (2018) as a combination of awareness, knowledge, skills, attitudes, and behaviors necessary for making sound financial decisions to achieve financial wellbeing. Financially literate individuals possess a better understanding of financial products, services, and risks, enabling them to access and benefit from formal financial systems (Ozili 2020). Bongomin et al. (2018) and Rahman et al. (2021) documented significant positive effects of FILT on FWG, attributing the relationship to improved financial planning, better management of savings, and greater awareness of available financial instruments. Aziz and Naima (2021) observed that lower levels of financial literacy constitute a significant barrier to the utilization of digital financial services among low-income populations. For poor households in NTT and NTB, where educational attainment is often limited, targeted financial literacy improvements are expected to translate into meaningful gains in financial wellbeing. This study thus hypothesizes:

H2: The FILT of poor households in NTT and NTB has a significant positive impact on FWG.

Relationship Between Digital Literacy and Financial Wellbeing

Digital literacy (DILT) encompasses the knowledge and skills needed to use digital media, access and process information, and operate digital financial services safely (UNESCO 2011). The growth of digital financial services has elevated the importance of DILT as a prerequisite for financial participation (Lyons & Kass-Hanna 2021). (OECD, 2022; UNESCO, 2011) employed three dimensions of mobile technology access, mobile phone proficiency, and mobile money proficiency to measure digital literacy in developing country contexts, finding significant associations with financial service usage and individual financial behavior. A higher level of DILT allows greater autonomy and confidence in using digital financial services. In eastern Indonesia, where digital infrastructure remains limited and connectivity is costly, the effect of digital literacy on financial wellbeing may be constrained by structural barriers. This study hypothesizes (Muir et al., 2017; Nandru et al., 2021):

H3: The DILT of poor households in NTT and NTB has a significant positive impact on FWG.

Relationship Between Digital Financial Service Infrastructure, Digital Financial Inclusion, and Financial Wellbeing

Digital financial service infrastructure (INF) constitutes the technical and institutional platforms enabling financial transactions across an economy. A well-designed infrastructure encompassing interoperable payment systems, digital identification, reliable internet connectivity, and user-accessible devices is critical for the effective delivery of financial services (Bhatia & Singh, 2024; Kabadayi & O'Connor, 2019; Yulyanah, 2023) demonstrated that robust digital financial infrastructure reduces the financial inclusion gap, particularly for geographically dispersed populations. Rewilak (2017) emphasized that poor groups may be unable to benefit from financial services regardless of financial sector depth when infrastructure is inadequate. In NTT and NTB, where internet connectivity remains uneven and mobile network coverage is incomplete, infrastructure limitations are expected to constrain direct access to financial wellbeing but to operate through digital financial inclusion as an intervening mechanism. Lyons et al. (2019) found that increases in financial service usage are larger in areas with more developed infrastructure. This study therefore hypothesizes:

H4: The INF has a significant positive impact on FWG of poor households in NTT and NTB.

H5: The INF has a significant positive impact on DFIC of poor households in NTT and NTB.

Relationship Between Financial Service Providers, Digital Financial Inclusion, and Financial Wellbeing

Financial service providers (FSP) play a dominant intermediation role in promoting financial wellbeing by offering products and services tailored to the needs of excluded populations (T. W. Bank, 2022; Neaime & Gaysset, 2018; Thathsarani et al., 2021) highlighted that FSP capable of offering suitable, affordable, and accessible financial services exert significant positive effects on individual financial wellbeing (Rahman et al., 2021; Sabri et al., 2022; Sehwat et al., 2021). In Indonesia, both formal banks such as Bank Rakyat Indonesia and Bank Negara Indonesia, and non-bank providers including digital wallet operators such as GoPay, OVO, DANA, and LinkAja, function as key providers of digital financial services to low-income populations. (Demirgüç-Kunt et al., 2017) identified the quality of financial institutions as a key factor in advancing financial inclusion. For poor households in NTT and NTB, FSP that are responsive to local financial needs and can deliver services through digital channels are expected to strengthen digital financial inclusion and thereby improve financial wellbeing. Based on these considerations, this study hypothesizes:

H6: The FSP has a significant positive impact on FWG of poor households in NTT and NTB.

H7: The FSP has a significant positive impact on DFIC of poor households in NTT and NTB.

Relationship Between Digital Financial Inclusion and Financial Wellbeing

Digital financial inclusion (DFIC) refers to the access and use of formal financial services by excluded and underserved populations through digital channels at affordable costs (CGAP 2015). Digital financial services such as electronic wallets, mobile banking, and digital payment platforms facilitate access to savings, credit, insurance, and investment, thereby contributing to poverty alleviation and improved financial wellbeing (Hair et al., 2019)(Ozili, 2020; Sehwat et al., 2021). Zhou and Wang (2021) demonstrated that inclusive digital finance significantly reduces medical, educational, and income poverty in China. Aziz and Naima (2021) found that DFIC enables vulnerable groups including low-income individuals, women, and the underemployed to improve their socioeconomic wellbeing through enhanced connectivity and financial service access. In eastern Indonesia, digital financial services accessible via platforms such as GoPay, OVO, DANA, and bank mobile applications represent transformative opportunities for poor households to participate in the formal economy. This study hypothesizes:

H8: DFIC has a significant positive impact on FWG of poor households in NTT and NTB.

Digital financial inclusion serves a vital mediating function by connecting financial service system factors with financial wellbeing outcomes. A well-functioning infrastructure enables individuals to access online banking, mobile banking, and electronic wallets effectively, while FSP offering services attuned to the needs of poor groups increases participation in the formal financial system and thereby enhances financial wellbeing (Demirgüç-Kunt et al. 2017; Lyons et al. 2019). Past studies such as (Anjani et al., 2024; W. Bank, 2021; Rahman et al., 2021) found significant mediating effects of financial inclusion between system-level factors and financial wellbeing. This study therefore hypothesizes:

H9a: DFIC mediates the relationship between INF and FWG of poor households in NTT and NTB.

H9b: DFIC mediates the relationship between FSP and FWG of poor households in NTT and NTB.

Table 1 provides the list of acronyms used throughout this study.

Acronym	Explanation
FBR	Financial Behaviour
FILT	Financial Literacy
DILT	Digital Literacy
INF	Digital Financial Service Infrastructure
FSP	Financial Service Providers
DFIC	Digital Financial Inclusion
FWG	Financial Wellbeing

Table 1 presents the structure and sources of the questionnaire. The research model comprises seven latent variables: FBR, FILT, DILT, INF, FSP, DFIC, and FWG. A five-point Likert scale (1 = strongly disagree, 5 = strongly agree) was used to measure respondents' agreement with each item. All questionnaire items were adapted from established instruments and modified to suit the Indonesian regional context.

Measurement of Variables

FBR was measured using five items adapted from the OJK Financial Behavior Survey (2022), covering aspects of spending behavior, savings management, and credit management. FILT was measured using six items adapted from the OJK SNLIK (2022), addressing financial planning, awareness of financial products and services, and understanding of interest rates and charges. DILT was measured using five items derived from (Aziz & Naima, 2021; Hair et al., 2013; Statistik, 2024), encompassing knowledge and skills in operating digital devices, accessing digital information, and using digital financial services safely. INF was measured using four items adapted from (Keuangan), 2024), covering device ownership, accessibility of digital financial channels, digital authentication systems, and customer support availability. FSP was measured using five items adapted from (D'Silva et al., 2019; Henseler et al., 2016; Selvia et al., 2021), addressing the provision of product information, digital service offerings, affordability, convenience, and time-saving benefits. DFIC was measured using six items derived from the Global Findex Questionnaire (2021), covering access, borrowing, payments, insurance, investment, and frequency of digital financial service use. FWG was measured using five items adapted from the OJK Financial Behavior (Keuangan), 2023), covering wealth accumulation, ability to meet financial commitments, living standards improvement, income coverage of living costs, and financial independence.

Table 2. The Demographic Profile

Variables	Frequency (%)	Variables	Frequency (%)
Gender		Monthly household income	
Male	67 (16.54)	< Rp 500,000	54 (13.33)
Female	338 (83.46)	Rp 500,001–1,000,000	76 (18.77)
Age		Rp 1,000,001–1,500,000	83 (20.49)
18–24	57 (14.07)	Rp 1,500,001–3,102,215	192 (47.41)
25–34	89 (21.98)	Education level	
35–44	127 (31.36)	No formal education	24 (5.93)
45–54	75 (18.52)	Primary school	35 (8.64)
55–60	39 (9.63)	Secondary school	180 (44.44)
> 60	18 (4.44)	Diploma	88 (21.73)
Ethnicity		Bachelor degree	76 (18.77)
Sasak	143 (35.31)	Master/PhD	2 (0.49)
Timorese (Atoni/Dawan)	75 (18.52)	Employment	
Bimanese	56 (13.83)	Government	185 (45.68)
Manggarai	38 (9.38)	Private	45 (11.11)
Javanese	30 (7.41)	Retiree	5 (1.23)
Ende	20 (4.94)	Self-employed	82 (20.25)
Sumba	17 (4.20)	Unemployed/housewife	88 (21.73)
Others	26 (6.42)	Province	
		NTT	248 (61.23)
		NTB	157 (38.77)
		Residential area	
		Rural	296 (73.09)
		Urban	109 (26.91)

Female respondents dominated the sample (83.46%), consistent with their central role in household financial management (Anjani et al. 2024). The majority of respondents fell within the 35–44 age group (31.36%), followed by 25–34 (21.98%) and 45–54 (18.52%). The dominant ethnic groups were Sasak (35.31%), reflecting the main ethnicity of NTB, Timorese/Atoni (18.52%), and Bimanese (13.83%), with other Florinese and Sumbanese groups constituting the remainder. Monthly household income was predominantly within the Rp 1,500,001 to Rp 3,102,215 range (47.41%), while 13.33 percent earned below Rp 500,000. Secondary school was the most common educational attainment (44.44%), followed by diploma (21.73%) and bachelor's degree

(18.77%). Government employees constituted the largest employment group (45.68%), followed by the unemployed and housewives (21.73%) and the self-employed (20.25%). Including housewives is important because they are central to household financial decisions (Anjani et al. 2024). The majority of respondents resided in rural areas (73.09%), consistent with the predominantly rural character of poverty in both provinces.

RESULTS AND DISCUSSION

Measurement Model

Table 3 presents construct reliability and convergent validity for all samples. Cronbach's alpha values exceeded 0.7 and AVE values exceeded 0.5 for all constructs across complete, NTT, and NTB samples, confirming adequate reliability and convergent validity (Hair et al. 2019). All item loadings exceeded 0.5, satisfying the acceptable threshold.

Table 3. Measurement model

Construct & Items	Loadings (Complete)	Loadings (NTT)	Loadings (NTB)	Cronbach's α (C/NTT/NTB)	AVE (C/NTT/NTB)
Financial Behaviour				0.812 / 0.784 / 0.818	0.561 / 0.536 / 0.579
FBR1	0.681	0.635	0.737		
FBR2	0.696	0.685	0.755		
FBR3	0.836	0.847	0.793		
FBR4	0.816	0.825	0.791		
FBR5	0.681	0.642	0.725		
Financial Literacy				0.886 / 0.891 / 0.889	0.643 / 0.640 / 0.642
FILT1	0.767	0.737	0.773		
FILT2	0.823	0.781	0.868		
FILT3	0.856	0.834	0.867		
FILT4	0.727	0.755	0.676		
FILT5	0.830	0.849	0.797		
FILT6	0.828	0.837	0.812		
Digital Literacy				0.893 / 0.879 / 0.857	0.707 / 0.673 / 0.651
DILT1	0.669	0.695	0.538		
DILT2	0.878	0.842	0.852		
DILT3	0.851	0.816	0.863		
DILT4	0.893	0.863	0.865		
DILT5	0.899	0.872	0.876		
Digital Fin. Service Infrastructure				0.809 / 0.766 / 0.779	0.629 / 0.592 / 0.601
INF1	0.751	0.701	0.731		
INF2	0.863	0.857	0.813		
INF3	0.829	0.819	0.800		
INF4	0.733	0.686	0.754		
Financial Service Providers				0.873 / 0.830 / 0.902	0.660 / 0.601 / 0.722
FSP1	0.858	0.811	0.904		
FSP2	0.855	0.805	0.907		
FSP3	0.641	0.578	0.724		
FSP4	0.862	0.838	0.871		
FSP5	0.835	0.814	0.828		
Digital Financial Inclusion				0.883 / 0.862 / 0.862	0.632 / 0.597 / 0.597
DFIC1	0.820	0.800	0.806		
DFIC2	0.643	0.591	0.818		
DFIC3	0.845	0.828	0.830		
DFIC4	0.856	0.842	0.879		

DFIC5	0.832	0.823	0.862
DFIC6	0.770	0.718	0.798
Financial Wellbeing	0.798 / 0.790 / 0.797		0.549 / 0.550 / 0.551
FWG1	0.682	0.689	0.675
FWG2	0.806	0.815	0.780
FWG3	0.863	0.856	0.855
FWG4	0.716	0.740	0.691
FWG5	0.618	0.576	0.696

Note: C = Complete sample; AVE = Average Variance Extracted

Discriminant validity was assessed using the HTMT criterion (Franke & Sarstedt 2019). Table 4 reports all HTMT values below 0.85 for all constructs across the complete, NTT, and NTB samples, confirming that each construct is conceptually distinct.

Table 4 HTMT Values Below 0.85 For All Constructs Across

	1 DFIC	2 DILT	3 FBR	4 FILT	5 FSP	6 FWG	7 INF
Complete							
DFIC							
DILT	0.666						
FBR	0.368	0.392					
FILT	0.353	0.519	0.647				
FSP	0.661	0.640	0.383	0.409			
FWG	0.662	0.456	0.571	0.429	0.492		
INF	0.698	0.777	0.290	0.303	0.784	0.471	
NTT							
DFIC							
DILT	0.591						
FBR	0.402	0.416					
FILT	0.327	0.607	0.552				
FSP	0.603	0.567	0.309	0.346			
FWG	0.741	0.437	0.513	0.325	0.461		
INF	0.709	0.682	0.258	0.285	0.834	0.463	
NTB							
DFIC							
DILT	0.667						
FBR	0.295	0.309					
FILT	0.295	0.323	0.782				
FSP	0.656	0.614	0.443	0.408			
FWG	0.542	0.541	0.670	0.613	0.546		
INF	0.568	0.742	0.272	0.215	0.653	0.502	

Table 5. Full collinearity testing (VIF)

	DFIC→FWG	DILT→FWG	FBR→FWG	FILT→FWG	FSP→DFIC	FSP→FWG	INF→DFIC	INF→FWG
Complete	1.963	2.316	1.494	1.685	1.804	2.142	1.804	2.437
NTT	1.831	2.040	1.384	1.643	1.824	1.987	1.824	2.352
NTB	1.888	2.047	1.853	1.897	1.445	2.036	1.445	1.839

Structural Model

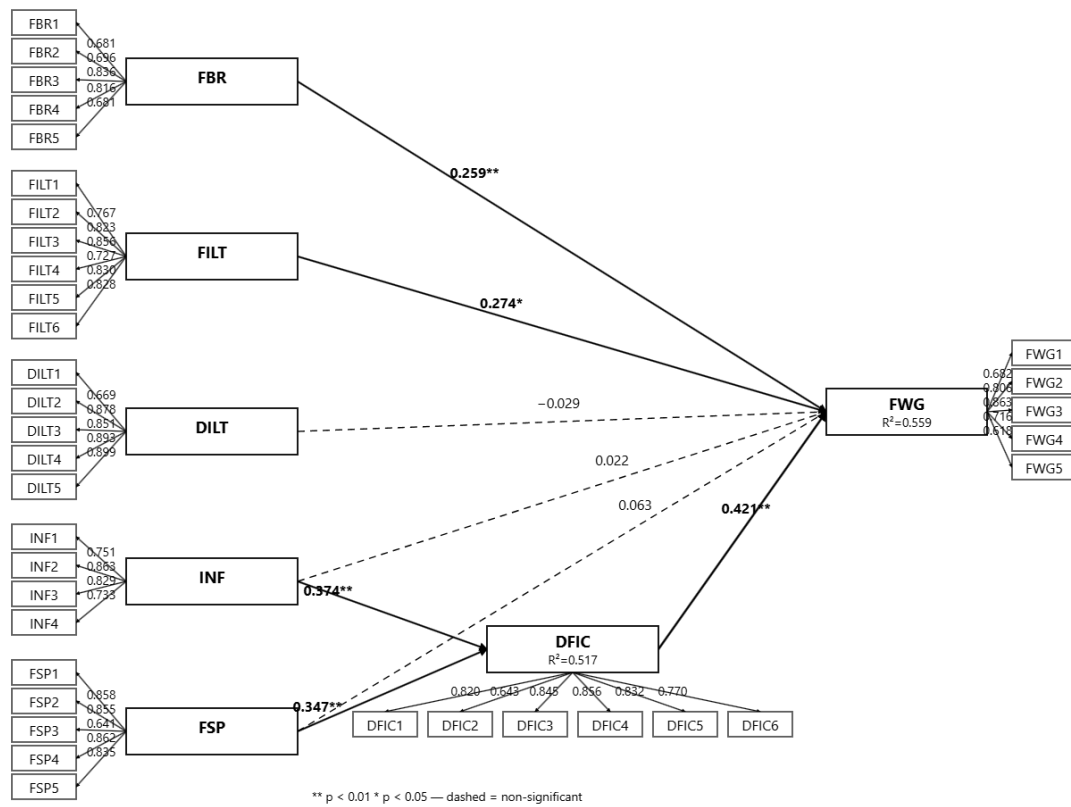


Figure 1. Structural Model HTMT Values

Table 6. Hypotheses testing

Hypothesis	Complete Std. Beta	Complete Std. Error	Complete p-value	NTT Std. Beta	NTT Std. Error	NTT p-value	NTB Std. Beta	NTB Std. Error	NTB p-value
Direct relationships									
H1: FBR→FWG	0.259	0.058	0.000	0.214	0.064	0.000	0.261	0.111	0.010
H2: FILT→FWG	0.274	0.054	0.046	0.208	0.068	0.030	0.235	0.089	0.004
H3: DILT→FWG	-0.029	0.076	0.351	0.022	0.087	0.402	0.093	0.106	0.189
H4: INF→FWG	0.022	0.073	0.382	-0.042	0.084	0.310	0.129	0.106	0.111
H5: INF→DFIC	0.374	0.059	0.000	0.225	0.087	0.005	0.438	0.078	0.000
H6: FSP→FWG	0.063	0.077	0.207	0.073	0.091	0.211	0.066	0.110	0.274
H7: FSP→DFIC	0.347	0.064	0.000	0.229	0.081	0.002	0.474	0.089	0.000
H8: DFIC→FWG	0.421	0.067	0.000	0.509	0.072	0.000	0.200	0.110	0.034
Mediation analysis									
H9a: INF→DFIC→FWG	0.157	0.034	0.000	0.115	0.051	0.000	0.088	0.031	0.048
H9b: FSP→DFIC→FWG	0.146	0.034	0.000	0.117	0.043	0.003	0.095	0.054	0.038
Model fit									
Adj. R ² (FWG)	0.559			0.584			0.689		
Adj. R ² (DFIC)	0.517			0.459			0.477		
Q ² (FWG)	0.281			0.213			0.410		

Note: 95% confidence interval and 5,000 bootstrapping replications

Multigroup Analysis (PLS-MGA)

To further examine provincial-level variation while avoiding overgeneralization, multigroup analysis was conducted with samples divided into NTT (n = 248) and NTB (n = 157). Table 8 presents the measurement invariance results based on MICOM (Henseler et al. 2016). Three steps were executed: (1) configural invariance was established, with measurement model assessments identical across groups; (2) compositional invariance was confirmed, as all c values exceeded the 5 percent quantile of Cu across all constructs; and (3) partial measurement invariance was established, as results showed unequal means with equal variances. This outcome permits the subsequent multigroup analysis.

TABLE 7. Measurement invariance testing (MICOM)

Const ruct	Configural invariance	Compositional invariance (c)	5% quantile of Cu	Permutation p-value	Differences (means)	95 % CI	Permutation p-value	Differences (variance)	95 % CI	Permutation p-value	Measurement invariance
FWG	Yes	0.999	0.990	0.854	Yes	0.19 2	[-0.161; 0.171]	0.035	0.28 0	[-0.246; 0.252]	0.033
FBR	Yes	0.988	0.984	0.098	Yes	0.26 8	[-0.160; 0.163]	0.006	-0. 054	[-0.226; 0.236]	0.356
FILT	Yes	0.995	0.986	0.363	Yes	0.39 8	[-0.160; 0.173]	0.000	0.11 7	[-0.340; 0.314]	0.320
DILT	Yes	0.997	0.994	0.255	Yes	0.98 8	[-0.171; 0.169]	0.000	-0. 104	[-0.204; 0.214]	0.213
DFIC	Yes	0.999	0.997	0.556	Yes	0.65 6	[-0.160; 0.175]	0.000	0.02 8	[-0.253; 0.275]	0.440
INF	Yes	0.997	0.993	0.333	Yes	0.87 7	[-0.174; 0.168]	0.000	-0. 101	[-0.231; 0.236]	0.237
FSP	Yes	1.000	0.995	0.970	Yes	0.61 8	[-0.165; 0.166]	0.000	-0. 182	[-0.269; 0.279]	0.126

Note: 95% confidence interval and 1,000 permutations

Table 8 presents the multigroup analysis results, indicating significant provincial differences between NTT and NTB for most path relationships. NTT exhibits a substantially stronger DFIC→FWG relationship ($\beta = 0.509$) compared to NTB ($\beta = 0.200$), suggesting that once poor households in NTT become digitally financially included, the wellbeing impact is particularly pronounced. In contrast, NTB demonstrates stronger infrastructure effects, with INF→DFIC ($\beta = 0.438$) and FSP→DFIC ($\beta = 0.474$) considerably higher than in NTT ($\beta = 0.225$ and $\beta = 0.229$, respectively). The FILT→FWG path does not show statistically significant differences between provinces, suggesting that the financial literacy–wellbeing relationship operates uniformly across both contexts.

Table 8. Multigroup analysis results

Hypotheses	Path coefficient (NTT)	Path coefficient (NTB)	p-value (NTT)	p-value (NTB)	Supported
FBR → FWG	0.214	0.261	0.000	0.010	Yes
FILT → FWG	0.208	0.235	0.030	0.004	No
DILT → FWG	0.022	0.093	0.402	0.189	Yes
INF → FWG	-0.042	0.129	0.310	0.111	Yes
INF → DFIC	0.225	0.438	0.005	0.000	Yes
FSP → FWG	0.073	0.066	0.211	0.274	Yes
FSP → DFIC	0.229	0.474	0.002	0.000	Yes
DFIC → FWG	0.509	0.200	0.000	0.034	Yes

Note: "Supported" refers to significant differences between provinces

Robustness Check

Table 9 compares two competing models to verify the robustness of findings. Model 1 includes only FBR, FILT, and DILT as independent variables, while Model 2 represents the full research model including INF and FSP. Model 2 produces lower AIC, BIC, and CAIC values than Model 1, confirming superior fit, and achieves higher adjusted R^2 (0.294 vs. 0.261). These results confirm that the findings of this study are robust and that the full model incorporating financial service system factors provides substantially better explanatory power.

Table 9. Robustness Check

	Model 1			Model 2		
	Std. Beta	Std. Error	p-value	Std. Beta	Std. Error	p-value
FBR	0.386	0.058	0.000	0.358	0.057	0.000
FILT	0.083	0.062	0.186	0.083	0.062	0.181
DILT	0.188	0.038	0.000	0.057	0.048	0.240

INF	—	—	—	0.111	0.051	0.029
FSP	—	—	—	0.132	0.052	0.011
AIC	769.447			753.128		
BIC	789.466			781.155		
CAIC	794.466			788.155		
Adjusted R ²	0.261			0.294		
R ²	0.268			0.301		

DISCUSSION

This study finds that FBR positively and significantly determines FWG, consistent with (Rahman et al., 2021)(Mahdzan et al., 2023). Poor households in NTT and NTB that engage in budgeting, maintain spending records, save before spending, and plan for the future exhibit higher financial wellbeing. Among the poorest population segments, disciplined financial behavior may serve as a critical buffer against income volatility and financial shocks. In the context of the Program Keluarga Harapan (PKH) cash transfer program and other government poverty alleviation schemes, recipients who demonstrate sound financial behavior are better positioned to translate transfers into sustained wellbeing improvements.

Financial literacy also emerges as a significant and positive determinant of financial wellbeing. Poor households possessing knowledge of financial services, budgeting principles, and investment mechanisms are better equipped to access and benefit from formal financial systems. This finding is consistent with (Mahdzan et al., 2023) (Rahman et al., 2021). In NTT and NTB, where OJK's SNLIK 2024 data indicate that financial literacy indexes remain below the national average, targeted literacy programs remain urgently needed.

Digital literacy does not emerge as a significant direct determinant of financial wellbeing in any sample, neither the complete nor provincial subsamples. This finding aligns with the source study (Lu et al. 2024) and may reflect the structural constraints facing poor households in eastern Indonesia (Aziz & Naima, 2021; A. D. Bank, 2017). Kominfo data indicated that as of late 2023, over 1,020 villages remained without internet connectivity nationally, with NTT and NTB facing disproportionately high internet costs and unstable connectivity (Freedom House 2024). When digital infrastructure is fundamentally inadequate, digital skills may not independently translate into improved financial wellbeing because the underlying service delivery channels remain inaccessible or unreliable (House, 2024).

The non-significant direct effects of INF and FSP on FWG, alongside their highly significant effects on DFIC, confirm the critical mediating role of digital financial inclusion. Infrastructure and provider quality do not directly improve household financial wellbeing unless they successfully draw poor households into the formal digital financial ecosystem (Lyons & Kass-Hanna, 2021). Once inclusion is achieved through platforms such as GoPay, OVO, DANA, or mobile banking applications from Bank BRI, households can access savings products, digital payments, micro-credit, and insurance, generating material improvements in financial wellbeing (Demirgüç-Kunt et al. 2017; Lyons et al. 2019). This is consistent with (Choung et al., 2023; Kass-Hanna et al., 2022), who documented digital financial inclusion as a pathway to poverty alleviation in China. The full mediation of the INF-FWG and FSP-FWG relationships through DFIC (H9a and H9b supported) reinforces this interpretation.

Digital financial inclusion itself emerges as the strongest direct predictor of financial wellbeing in the complete sample ($\beta = 0.421$) and in NTT ($\beta = 0.509$). Being included in digital financial systems enables poor households to use online banking, mobile banking, and electronic wallets to access savings, borrowing, payment, insurance, and investment services, which substantially improve financial wellbeing and contribute to poverty exit (United Nations 2016; Zhou & Wang 2021).

The multigroup analysis reveals important provincial heterogeneity. NTT's substantially stronger DFIC-FWG pathway reflects the particularly transformative nature of financial inclusion for an extremely poor population where the poverty rate approached 20 percent in early 2024 (BPS 2024). When a household in NTT transitions from financial exclusion to inclusion, the wellbeing gains are disproportionately large because the baseline is so low and financial vulnerability so acute (Selvia et al., 2021). In NTB, by contrast, where poverty rates are relatively lower and digital infrastructure somewhat more developed, the infrastructure and provider pathways to DFIC are stronger, suggesting that system-level investments in NTB translate more efficiently into financial inclusion. The non-significant difference in the FILT-FWG relationship suggests that financial literacy

operates as a universal determinant of wellbeing, with comparable effects in both provinces regardless of infrastructure differences.

Implications

This study enriches the existing body of knowledge by examining both household-level and financial service system factors and their relationships with digital financial inclusion and financial wellbeing for poor households in eastern Indonesia. The PLS multigroup analysis highlights differential pathways between NTT and NTB, providing a more granular understanding of financial wellbeing dynamics in this underserved region. Financial education for poor households must be prioritized, as individual financial literacy shapes financial behavior and together these factors significantly determine financial wellbeing. Government agencies, non-governmental organizations, and OJK regional offices in NTT and NTB should establish community-based financial education programs encompassing financial planning, household budgeting, debt management, and awareness of available digital financial products. Such programs should be delivered in local languages and adapted to the cultural contexts of diverse ethnic communities including Sasak, Timorese, Bimanese, and Manggarai households.

Financial service providers, including both state-owned banks such as Bank Rakyat Indonesia and digital wallet operators, have a critical role in advancing financial wellbeing among poor households. Providers should develop more tailored digital financial products responsive to the specific needs of low-income households in eastern Indonesia, including low-minimum savings products, micro-insurance linked to the agricultural and fishery sectors, and accessible micro-credit with simple digital onboarding processes. Cultural competency considerations are essential in product and service design, given the linguistic and cultural diversity of the target population.

Digital financial service infrastructure represents a foundational prerequisite for improving financial wellbeing indirectly through financial inclusion. The Indonesian government and Kementerian Komunikasi dan Informatika must accelerate the expansion and upgrading of internet connectivity in rural NTT and NTB, including through the extension of broadband cable networks, deployment of additional telecommunication towers, and targeted subsidization of internet access costs in remote areas. The Palapa Ring initiative and Universal Service Obligation (USO) fund should be leveraged to address the persistent digital divide that disadvantages poor households in eastern Indonesia relative to their counterparts in Java and Sumatra.

The stronger DFIC-FWG effect in NTT implies that policies accelerating financial inclusion in this province will yield particularly large wellbeing returns. Dedicated inclusion campaigns targeting the most remote and financially excluded kabupaten of NTT, supported by agent banking networks and mobile financial service units, are recommended. In NTB, where INF and FSP pathways to DFIC are relatively stronger, investments in provider quality and infrastructure reliability will more efficiently convert into inclusion gains and, ultimately, wellbeing improvements.

CONCLUSION

Financial inclusion has remained a core pillar of the Indonesian government's poverty alleviation agenda, and its digital dimensions are increasingly central to achieving the SDG 1 target of ending poverty for all. This study, targeting poor households in NTT and NTB whose incomes fall below the provincial poverty line, addresses a critical and underexplored dimension of this agenda. Digital financial inclusion represents a cornerstone of a thriving digital economy and serves as a bridge for vulnerable groups, particularly the poorest households in eastern Indonesia.

The findings confirm that financial behavior, financial literacy, and digital financial inclusion are significant determinants of financial wellbeing among poor households in NTT and NTB, while digital literacy does not exert a significant direct effect. Digital financial inclusion fully mediates the impacts of digital financial service infrastructure and financial service providers on financial wellbeing. The multigroup analysis reveals that the magnitude of the DFIC→FWG relationship is substantially higher in NTT, while NTB shows stronger infrastructure and provider effects on DFIC. The model demonstrates strong explanatory power, accounting for approximately 56 to 69 percent of variance in financial wellbeing.

The integrated framework developed in this study can serve as a reference model for subsequent research on financial wellbeing in the digital economy, particularly in developing country contexts characterized by geographic remoteness, poverty, and uneven digital access. Future research should consider expanding the geographic scope to include Papua and other eastern Indonesian provinces, incorporating

objective measures of financial wellbeing alongside subjective measures, and examining longitudinal dynamics of digital financial inclusion and household welfare.

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