

## DIGITAL FINANCIAL LITERACY AND PERCEIVED FINANCIAL WELL-BEING AMONG INDIAN ADOLESCENTS AND YOUNG ADULTS: THE IMPORTANCE OF FINANCIAL CAPABILITY AND RESILIENCE

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**ABSTRACT.** To understand the pathway for achieving financial well-being in the present era of digital financial services, the present study aims to examine the role of financial capabilities and resilience in the association between digital financial literacy and perceived financial well-being. We used judgment sampling to collect data from 201 adolescents and young adults aged 15 to 34 years ( $n=187$ , 93%) in India who are experienced users of digital financial services. Structural equation modelling (PLS-SEM) is used to test the hypotheses. Findings reveal that financial capability and financial resilience completely and serially mediate the association between digital financial literacy and perceived financial well-being. The results imply that building financial capability and resilience against unexpected financial shocks can develop a sense of financial security and freedom that eventually contributes to financial well-being. Thus, this study provides a roadmap to achieving perceived financial well-being in the digital realm by integrating and synergizing digital financial literacy with financial capability and financial resilience.

### 1. INTRODUCTION

The financial crisis unveils the financial vulnerabilities of people living in a society. The Covid-19 pandemic raised serious concerns about perceived financial well-being (PFWB) as individuals and businesses struggled to overcome financial losses characterised in part by the lack of sufficient financial knowledge, poor financial planning, and inadequate accessibility of financial services (Botha et al. 2021; Clark, Lusardi, and Mitchell 2021). PFWB is defined as “A state of being wherein a person can fully meet current and ongoing financial obligations, can feel secure in their financial future, and can make choices that allow them to enjoy life” (Consumer Financial Protection Bureau [CFPB] 2015; Brügggen et al. 2017). The prevailing assumption across both policy and practice is that high financial literacy leads to improved PFWB (Xiao, Chen, and Chen 2014b). However, during Covid-19, nearly 81% of Indian employees, despite being financially literate, faced a financial breakdown between pay periods leading to mental and financial distress, indicating poor financial decision-making (Dey 2021).

The concerns about PFWB have intensified with the rapid proliferation of technology in the financial system. With the help of digital technologies, financial services are now available at an affordable cost and in ways that are sustainable to individuals (Gomber, Koch, and Siering 2017; Morgan, Huang, and Trinh 2020). However, along with the merits of transparency, connectivity, convenience, and access, digital technologies also pose several challenges such as digital identity thefts, impulsive buying, and over-indebtedness due to lack of ability to appropriately navigate

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digital financial platforms (Yue et al. 2022). Additionally, although digital financial systems are expanding quickly, but they are still not widely accepted, particularly in developing countries (Geetha and Kanniammal 2023).

This brings to light a new paradigm of linking financial literacy with digital literacy, by complementing traditional financial literacy with digital literacy skills (Kass-Hanna, Lyons, and Fan 2022). Digital financial literacy (DFL) implies gaining knowledge about financial services that are delivered over digital platforms in terms of “knowledge of digital financial products and services, awareness of digital financial risks, knowledge of digital financial risk control, and knowledge of consumer rights and redress procedures” (Morgan, Huang, and Trinh 2020). As per a recent report by Organization for Economic Cooperation and Development (OECD), the utilization of digital platforms to deliver financial literacy can enhance both financial resilience and transformation, thereby promoting financial well-being and catering to the needs of groups facing greater risk of financial vulnerability (OECD 2021).

DFL is important, but it is not a sufficient condition to have a long-term impact on the well-being as there are some other considerations such as psychological and behavioural factors that can induce or limit the level of PFWB (Huang, Nam, and Sherraden 2013). Perceived financial capability (PFC) is assumed to be an important factor in building behaviours that lead to financial security and freedom (Friedline and West 2016). Financial capability has been defined by researchers in different ways (Johnson and Sherraden 2007; Xiao et al. 2022). The PFC level exhibits one’s perceived ability to feel confident about the financial decisions he/she makes derived from a sense of control over one’s financial affairs. Prior literature shows that DFL fosters financial capabilities and resilience in times of financial vulnerability by stimulating desirable financial behaviours (Lyons et al. 2021; Kass-Hanna, Lyons, and Fan 2022).

Apart from financial literacy and capability, whether individuals are resilient against adverse financial events that either temporarily or permanently affect their finances is also an important factor to be considered. Financial resilience (FR) implies the ability of an individual to quickly recover from a sudden fall in income or an unavoidable rise in expenditure (Muir et al. 2016; Salignac et al. 2019). While perceived knowledge coupled with access make people financially capable, financial decisions that reflect healthy financial behaviour make an individual financially resilient (Huang, Nam, and Sherraden 2013; Sherraden 2013; Muir et al. 2016;). To this end, this study assumes that PFC and FR are interrelated, but distinct concepts, and a financially capable individual is more likely to be resilient.

The present study focuses on interventions to enhance adolescents and young adults’ PFWB because the lack of financial exposure at a young age significantly influences financial choices in later life (Kim and Chatterjee 2013; Ullah and Yusheng, 2020), which can hinder the propagation of financial decision-making skills. Emerging adulthood is a unique phase of life in which an individual is most likely to gain financial and emotional independence, therefore, it becomes essential to resolve the challenges that inhibit emerging adults’ financial independence (Shim et al. 2013; Xiao, Chatterjee, and Kim 2014a). Understanding the mechanisms that promote their well-being is also important for policymakers and practitioners to frame their policies more prudently. Further, our study examines the direct and indirect pathways to improve PFWB through DFL. Also, considering the significance of psychological and behavioural factors in determining PFWB (Shim et al. 2009), we examine the mediating roles of PFC and FR in the association of DFL and PFWB.

The study contributes to the literature on PFWB on several fronts. First, this study uses a consolidated measure of DFL reflecting knowledge, experience, and frequency of using digital financial services (DFS) along with widely used objective financial knowledge (OFK) measure. Second, to the best of our knowledge, studies exploring the mediating role of PFC and FR in the association between DFL and PFWB are virtually non-existent. Our study also contributes to the literature by taking a wider approach to assessing resilience-building financial behaviours. While prior studies mostly focused solely on savings habits, we consider the broader set of financial behaviours, including saving and borrowing habits, and risk management strategies

such as keeping funds for emergencies. Lastly, while most of the prior research has been conducted in developed economies, this study will provide an emerging country perspective, adding to the body of knowledge. The rest of the paper is organized as follows: Section 2 covers the literature review, theoretical background, and hypotheses formation, followed by the research methodology in Section 3. We provide the results in Section 4 and discuss our findings in Section 5. Section 6 presents implications, Section 7 states the limitations and future research, and concludes the paper.

## 2. LITERATURE REVIEW AND HYPOTHESES

**Perceived financial well-being.** PFWB includes both, objective and subjective measures, however, it has been widely conceptualized as a purely subjective construct (Brüggen et al. 2017; Kumar et al. 2022). Well-being relates to individuals' experiences in life, which can be different for every individual (Prawitz et al. 2006). The conceptualization of PFWB as a subjective measure seems more appropriate as it can also reflect one's subjective assessment of financial issues such as financial strain and well-being, which are difficult to measure objectively (Brüggen et al. 2017).

We use the theory of planned behaviour as the theoretical foundation, which provides a constructive framework to handle the intricacies of social behaviour (Ajzen 1991). The theory is frequently used to explain behavioural patterns and recognize how individuals form behavioural judgments (Xiao and Wu 2008). Drawing upon the theory of planned behaviour, to direct an individual's behaviour toward positive financial outcomes, it is fundamental to determine what interventions to explore to assist people in implementing desirable financial behaviours and practices. To this end, we recognize three main predictors of PFWB: DFL, PFC, and FR (see Figure 1). These factors indicate an individual's financial knowledge and skills, financial behaviour, and financial practices respectively (Lone and Bhat 2024). We argue that individuals who have DFL, are financially capable, and are resilient to adverse financial shocks, demonstrate a high level of PFWB. Thus, utilizing the theory of planned behaviour, this study examines the significance of interventions such as PFC and FR in shaping PFWB.

**Digital financial literacy.** Prior research suggests that improving DFL is obligatory to utilize the benefits of DFS, and digital literacy acts as a crucial component of financial literacy in this digital era (Morgan and Trinh 2019; Morgan, Huang, and Trinh 2020). Morgan and Trinh (2019) proposed four dimensions of DFL: knowledge of digital financial products and services; experience in using digital financial products and services; awareness of digital financial risks; and skill in controlling and managing digital financial affairs. Studies focusing on the specific association between DFL and PFWB are scarce to date. However, we found one article which demonstrated that DFL acts as a mediator in the relationship between digital skills and PFWB (Kumar et al. 2022). Based on the review, we argue that DFL enriches individuals with knowledge and provides appropriate skills to utilize DFS, which in turn assists them in performing desirable financial behaviour to achieve PFWB.

The "Goal Framing Theory" can be utilized to understand the theoretical background of DFL, which states that individuals seek the accomplishment of their goals by exposing themselves to various forms of self-regulating behaviours, with the ultimate aim of achieving well-being (Lindenberg and Steg 2007). This theory assumes that individuals try to achieve multiple/conflicting goals, which may be grouped into hedonic, gain, and normative goal frames, reflecting their future decision-making behaviour. In the present study, DFL may be categorized into the 'gain goal frame' whereby achievement of the goal (PFWB), entails commitment of resources (improving DFL through digital financial experience, digital financial knowledge, and using DFS).

Therefore, we posit the following hypothesis:

H1: Digital financial literacy has a significant positive association with perceived financial well-being.

**Perceived financial capability.** PFC is an emerging area of interest among researchers and is considered an important aspect of overall consumer well-being (Atkinson et al. 2007; Xiao, Chen, and Chen 2014b). Atkinson et al. (2007) measured PFC by considering four dimensions: managing money, planning ahead, choosing products, and staying informed. Noteworthy, PFC may differ from the actual financial capability as the PFC captures individuals' self-perceptions and confidence in financial affairs, rather than measuring their actual knowledge and skills (Sherraden 2013). The existing literature on PFC posits that financially literate individuals are more likely to engage in sound financial practices and achieve better financial outcomes (Stolper and Walter 2017). Concerning adolescents and young adults, studies majorly examine the predictors of PFC such as financial self-efficacy (Xiao, Chen, and Chen 2014b), financial education (Xiao and O'Neill 2016), and its outcomes in the form of overall well-being, financial satisfaction and PFWB (Xiao and O'Neill 2016; Tahir, Ahmad, and Richards 2021).

PFC can be best described by the capability approach propounded by Amartya Sen and Martha Nussbaum (Sen 1993), which presumes that perceived self-efficacy and one's perception of their abilities, act as a significant predictor of behaviour. Financial self-efficacy has a positive and significant impact on financial satisfaction (Mukhtar et al. 2023). In representing the capabilities approach, we argue that DFL builds internal competencies (confidence, skills, and attitude) among individuals and the use of DFS promotes inclusivity, reflecting desirable external conditions. We assert that DFL empowers adolescents and young adults with digital skills and confidence to utilize DFS and also promotes financial inclusivity, thereby leading to sound PFWB. Thus, we propose the following hypothesis:

H2: The association of digital financial literacy with perceived financial well-being is positively mediated by perceived financial capability.

**Financial resilience.** The concept of FR is multidimensional (Salignac et al. 2019). FR is defined as "One's ability to resist, cope and recover from negative financial shocks, resulting from various unexpected events, such as loss of employment, health issues, the demise of the key earning member in the family, damage to household possessions, or other large unexpected expenses" (Muir et al. 2016; Salignac et al. 2019; McKnight and Rucci 2020). FR and financial vulnerability are two sides of the same coin (Kass-Hanna, Lyons, and Fan 2022). As per Anthony et al. (2021), vulnerability creates financial stress which leads to low levels of FR. The behaviours such as the inability to repay debt make people financially vulnerable, especially when faced with adverse financial situations (Yue et al. 2022). FR is the outcome of desirable financial behaviours such as keeping emergency savings, financial access, and PFC (Reyers 2019). The results of prior studies show that excessive use of digital media can lead to financial vulnerability which has a negative impact on PFWB (She et al. 2021).

A review of prior literature suggests that little research effort has been made to explore the mediating role of FR, specifically on the relationship between DFL and the PFWB of adolescents and young adults. To this end, this paper considers FR as the mediator between DFL and PFWB and proposes the following hypothesis:

H3: The association of digital financial literacy with perceived financial well-being is positively mediated by financial resilience.

The research exploring the association between PFC and FR suggests that PFC, financial self-efficacy, and financial access positively influence FR, making individuals prudent to financial shocks by encouraging emergency savings behaviour (Xiao, Chatterjee, and Kim 2014a; Reyers 2019). Daniels, McCalman, and Bainbridge (2021) also confirmed the role of financial literacy and PFC in strengthening FR. Therefore, drawing from the literature, this paper assumes that PFC and FR sequentially influence the relationship between DFL and PFWB (see Figure 1). We posit that DFL of adolescents and young adults, which comprises digital and financial skills coupled with financial access and self-efficacy can be used to improve the level of PFC, which empowers them with resilience to face financial shocks leading to enhanced PFWB. Therefore, we propose the following hypothesis:

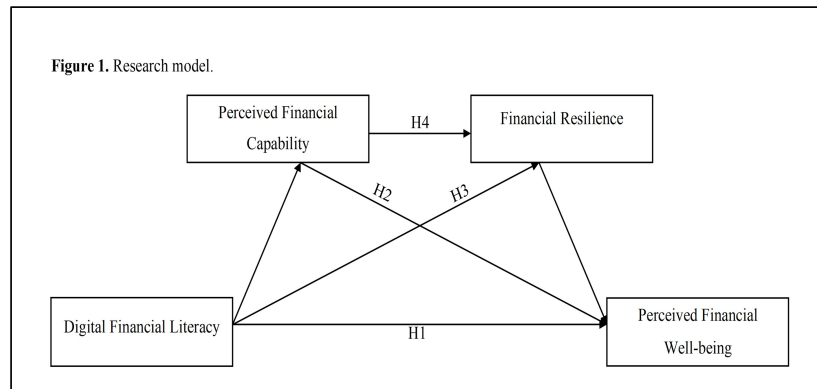


FIGURE 1. Proposed research model (Source: Author's work)

H4: The association of digital financial literacy with perceived financial well-being is serially and positively mediated by perceived financial capability and financial resilience.

### 3. RESEARCH METHODOLOGY

**3.1. Data collection.** To test the proposed hypotheses, we prepared a structured questionnaire and conducted pilot testing on a sample of 30 respondents which mainly included academics, to assess its content and face validity (Kapoor et al. 2014). The Cronbach's alpha exceeds the minimum threshold of 0.70, indicating good construct reliability. The population of study constitutes adolescents and young adults who are actual users of DFS. The sample was chosen for two gripping reasons, first, while DFSs offer convenience and easy access to its users, lack of sufficient knowledge to utilize DFSs in a responsible manner can result into debt traps, anxiety, and increased financial vulnerability (She et al. 2021; Yue et al. 2022), and second, transition into adulthood is a critical phase in an individual's life and development of responsible financial behaviors early in life can lead to greater financial well-being in the long-term (Sabri et al. 2023). Due to the unavailability of a sampling frame, we adopt the non-probability judgment sampling method (Hew et al. 2018). To ensure that the sample is representative of the target population, few initial qualifying questions were added to the survey. These screening questions allowed us to infer that respondents have at least some previous experiences in the use of DFSs. Concerning procedural bias, we made participation in the survey voluntary and anonymous. We use online (Google Forms) as well as offline means to collect data. We collect data during June 2022 from the Punjab state of India. Initially, we received a total of 136 online responses, but after identifying unengaged responses, we retained 116 valid responses. We also collect data through offline mode, and after the data-cleaning process, we retain only 85 responses. Thus, we end up with a total of 201 valid records to use for data analysis. The sample size exceeds the suggested minimum sample size (55) computed using G\* Power with an effect size of 0.15, and an alpha level of 0.05 to achieve a statistical power of 80 per-cent (Kumar et al. 2022). It is advisable to have a sample three times this number, thus, satisfying the minimum sample size's requirements (Hair et al. 2019).

**3.2. Measures.** The measurement instruments used in the study are mainly literature-based. This study adopts the subjective measure to examine PFWB using the "In-charge Financial Distress/Financial Well-Being Scale (IFDWF)" proposed by Prawitz et al. (2006). This instrument measures the level of stress, and well-being resulting from one's financial conditions. In this regard, this research also acknowledges the variability that may arise due to differences in an individual's actual financial state and their perceived level of financial well-being. DFL measure was adapted from Morgan and Trinh (2019) and includes items related to digital financial experiences, digital financial knowledge, usage of digital financial services, and level of

objective financial knowledge. The DFL score is the simple average of all the items included in the construct. Items measuring OFK were taken from Sharif et al. (2020) covering concepts like simple interest, time value of money, inflation, risk-return relationship and diversification. These were originally used by Lusardi and Mitchell (2014) to examine the impact of financial literacy on economic decision-making the united states. To compute OFK, we first converted each multiple-choice question into a binary dummy variable with 1 for each correct and 0 for incorrect answer, and then combined all five dummy items to form one variable representing OFK score (Xiao and O'Neill, 2016; Tahir et al. 2021). We measure PFC following the conceptualization provided by Atkinson et al. (2007) and endorsed by Tahir, Ahmad, and Richards (2021). FR is measured using the conceptual framework of Muir et al. (2016) and Salignac et al. (2019). Building FR requires individuals to engage in desirable financial behaviours and practices leading to financial security. We define these critical behaviours as one's saving and borrowing habits, and risk management strategies regarding preparedness for emergencies (Kass-Hanna, Lyons, and Fan 2022). The items are measured on a Likert 5-point scale, ranging from 1 (strongly disagree) to 5 (strongly agree). The detailed list of construct/items and their sources are available in Annexure-I.

**3.3. Data analysis method.** The preliminary conditions for selecting a data analysis technique involve meeting the assumptions regarding common method bias (CMB), multicollinearity, and tests for normality (Lee et al. 2016). To check CMB, we use Harman's single-factor test and the findings reveal that the resulting single factor accounts for only 34.07 percent of the total variance. As the value is less than 50 percent, there is no evidence of substantial CMB. Moreover, the bivariate correlations between the construct are also not excessively high ( $\leq 0.70$ ), which further confirms the absence of CMB (Kumar et al. 2022). Next, we checked multicollinearity between construct items with variance inflation factor (VIF) and found that the VIF values are less than 5 (3.952 in our case) except for one item DFE1 (5.816). After dropping DFE1, no collinearity issues were found. Thus, we removed the DFE1 from our analysis. For the test of normality, we use the Shapiro-Wilk test and a one-sample Kolmogorov-Smirnov test. The p-values in both tests are less than 0.05, indicating that data do not follow the normal distribution. These findings prompt us to use partial least square-based structural equation modelling (PLS-SEM) instead of covariance-based structural equation modelling (CB-SEM) as our data do not meet the required conditions to apply CB-SEM (Rigdon 2016). Additionally, we also use the PLS-predict procedure to estimate the out-of-sample predictive power (Shmueli et al. 2019), and importance-performance map analysis (IPMA) to extend the standard PLS-SEM reporting (Ringle and Sarstedt 2016). We consider PLS-SEM appropriate for our statistical analysis as our proposed model includes complicated interactions where there are a lot of interconnections between the model constructs (Chin 2010), and PLS-SEM is preferred as it enables the estimation of complex models with many constructs, indicator variables, and structural paths without imposing distributional assumptions on the data (Hair et al. 2018). Further, it helps in testing a theoretical framework from a prediction perspective and also works on smaller samples (Wold 1985; Hair et al. 2019).

## 4. RESULTS

**4.1. Demographic characteristics and descriptive statistics.** The demographics are presented in Table 1. The majority of the respondents were male ( $n=113$ , 56.2%), less than 35 years of age ( $n=187$ , 93.03%), and having at least three years of experience in the use of digital financial services ( $n=145$ , 72.13%). The most distinctive characteristic of the sample is that they are highly educated, with at least a Master's degree ( $n=134$ , 66.67%). In almost half of the cases, there were at least three dependent members in the respondent's family ( $n=107$ , 53.2%), however, there were only one-third cases where number of earning members were three or more ( $n=66$ , 32.8%). The largest income group was earning INR16000 or less per month

(n=84, 41.8%), while nearly two-third of the respondents were earning up to INR32000 monthly (n=137, 68.15%). Following table (see Table 1) depicts the distinct attributes of the sample.

TABLE 1. Demographics Profile

Characteristics	Categories	n	%	Coding
Gender	Male	113	56.2	1
	Female	88	43.8	2
Age (in years)	15 or higher – less than 25	91	45.2	1
	25 or higher – less than 35	96	47.8	2
	35 or higher – less than 45	12	6.0	3
	45 or higher	2	1.0	4
Area of living	Rural	95	47.3	1
	Urban	106	52.7	2
Education	12th class or below	10	5.0	1
	Graduation	57	28.3	2
	Post-Graduation or higher	134	66.7	3
Marital status	Unmarried	172	85.6	1
	Married	29	14.4	2
Number of earning members in the family	One	58	28.9	1
	Two	77	38.3	2
	Three or more	66	32.8	3
Number of dependent members in the family	2 or less	94	46.8	1
	3-4	78	38.8	2
	5 or more	29	14.4	3
Work status	Employees	73	36.3	1
	Self-employed	21	10.4	2
	Others (Students, Doctoral fellows etc.)	107	53.3	3
Average monthly income of the respondent* (in Rupees)	16000 or below	84	41.8	1
	16000-32000	53	26.4	2
	32000-48000	39	19.3	3
	48000 or above	25	12.5	4
Primary bank account	Public sector bank	155	77.1	1
	Private sector bank	40	19.9	2
	Payment bank	6	3.0	3
Experience in the use of digital financial services	2 or less years	56	28	1
	3-4 years	66	33	2
	5 or more years	79	39	3

*Note: n = Frequency; % = Percentage. \*The income is classified based on the Centre for Monitoring Indian Economy Pvt. Ltd. (CMIE) income classification approach.*

Table 2 shows the descriptive statistics. The sample depicts a moderately high level of DFL as well as PFC. These results are consistent with the findings of Tahir, Ahmad, and Richards (2021). DFL is higher in males ( $M = 3.94$ ,  $p < 0.05$ ) than in females ( $M = 3.70$ ,  $p < 0.05$ ) and differs significantly in terms of income ( $f = 2.808$ ,  $p < 0.05$ ) and experience in the use of DFS ( $f = 3.750$ ,  $p < 0.05$ ). FR differs significantly in terms of the number of earning members in the family ( $f = 8.125$ ,  $p < 0.01$ ) and the income of the respondent ( $f = 5.646$ ,  $p < 0.01$ ). Specifically, families with only one earning member have lower FR as compared to their other counterparts, and respondents whose income is 16000 or below, have significantly lower FR than respondents whose income lies between 32000-48000. These findings may be associated to the fact that as number of earning members in a family increase or income level increases, it leads to improved financial stability and also boosts the self-efficacy of individuals as they can draw assistance from other family members to overcome financial adversities. PFWB differs in terms of the number of earning members in the family ( $f = 3.792$ ,  $p < 0.05$ ) and the income of the respondent ( $f = 2.667$ ,  $p < 0.05$ ). These results suggest that PFWB of respondents who belong to a family with two or more earning members is high compared with the respondents having only one earning member in the family.

TABLE 2. Descriptive Statistics

Items	DFL	PFC	FR	PFWB
Mean scores	3.83	3.67	3.40	3.18
Standard deviation	0.811	0.739	0.794	0.769
Gender:				
Males	(3.94, 0.756)*			
Females	(3.70, 0.860)*			
Earning members in the family:			$f = 8.125^{**}$	$f = 3.792^*$
One			(3.22, 0.780)**	(3.10, 0.805)
Two			(3.27, 0.793)**	(3.06, 0.751)*
Three or more			(3.71, 0.723)**	(3.39, 0.723)*
Monthly income (in Rupees):	$f = 2.808^*$		$f = 5.646^{**}$	$f = 2.667^*$
16000 or below	(3.65, 0.866)		(3.15, 0.796)**	(3.01, 0.771)*
16000-32000	(3.89, 0.619)		(3.46, 0.671)	(3.27, 0.788)
32000-48000	(4.06, 0.835)		(3.67, 0.750)**	(3.39, 0.728)*
48000 or above	(3.98, 0.855)		(3.66, 0.881)	(3.22, 0.702)
Experience in DFS: (in years)	$f = 3.750^*$			
2 or less	(3.59, 1.008)			
3-4	(3.92, 0.692)			
5 or more	(3.94, 0.715)			

*Note: Items in brackets = (Mean, Standard deviation);  $f$  =  $f$ -statistic, \* $p$ -value  $< 0.05$ , \*\* $p$ -value  $< 0.01$ .*

**4.2. Assessment of measurement models.** In PLS-SEM, a two-step approach is followed, wherein the measurement model is inspected before the assessment of the structural model (Ringle, Wende, and Becker 2022). Thus, we first evaluate the measurement model and then proceed to examine the structural model.



The first step in assessing reflective measurement models is to examine the indicator loadings. Loadings above 0.708 are desirable (Henseler and Fassott 2010; Hair et al. 2018). However, as per Carmines and Zeller (1979), loadings of 0.60 or higher are also acceptable. The results on the reliability and validity of measurement models are presented in Table 3. All outer loadings (except for OFK) are within acceptable limits and are statistically significant at a 99% confidence interval. Although the outer loading of OFK is 0.485, since this item forms an important part of the conceptualization of DFL (Lyons et al. 2021; Kass-Hanna, Lyons, and Fan 2022), and the item's outer weight is significant at a 99% confidence interval, which implies that this item contributes to the content validity, we decide to retain it in our study (Cenfetelli and Bassellier 2009). Thus, the reliability of all individual items is confirmed.

The second step relates to the internal consistency and reliability assessment, which is tested using composite reliability and Cronbach's alpha. As can be seen in Table 3, both Cronbach's alpha and Composite reliability (CR) values are higher than 0.70, thus suggesting the presence of internal consistency and construct reliability (Nunnally 1994). We check convergent validity using the average variance extracted (AVE) metric in the third step. An acceptable value of AVE is 0.50 or higher (Hair et al. 2019), indicating that the construct explains at least 50 percent of the variance of its items. AVE values of all constructs are above 0.50 (see Table 3), thereby establishing convergent validity.

TABLE 3. Reliability and Validity Results

Construct/Items	Loadings	VIF	$\alpha$	CR	AVE	$R^2$	$Q^2$
Digital Financial Literacy			0.850	0.879	0.514		
DFE2	0.821	3.177					
DFK1	0.694	1.278					
DFK2	0.720	2.606					
DFS1	0.742	2.285					
DFS2	0.739	3.501					
DFS3	0.769	3.952					
OFK	0.485	1.173					
Perceived Financial Capability			0.881	0.907	0.584	0.210	0.189
PFC1	0.747	2.177					
PFC2	0.755	2.030					
PFC3	0.761	1.946					
PFC4	0.853	2.811					
PFC5	0.754	1.845					
PFC6	0.707	1.826					
PFC7	0.764	2.100					
Financial Resilience			0.706	0.817	0.529	0.512	0.210
FR1	0.786	1.704					
FR2	0.714	1.189					
FR3	0.735	1.369					
FR4	0.669	1.386					
Perceived Financial Well-being			0.895	0.916	0.577	0.533	0.121
PFWB1	0.648	1.669					
PFWB2	0.782	2.220					
PFWB3	0.810	2.540					
PFWB4	0.791	2.206					
PFWB5	0.816	2.351					

Construct/Items	Loadings	VIF	$\alpha$	CR	AVE	$R^2$	$Q^2$
PFWB6	0.716	1.794					
PFWB7	0.790	2.614					
PFWB8	0.711	2.190					

*Note: VIF = Variance Inflation Factor;  $\alpha$  = Cronbach's Alpha; CR = Composite Reliability; AVE = Average Variance Extracted;  $R^2$  = Coefficient of Determination;  $Q^2$  = Cross-validated redundancy measure.*

Finally, we examine the discriminant validity through the Heterotrait-Monotrait (HTMT) ratios of the correlations. Discriminant validity problems are present when HTMT values are 0.90 or higher for structural models with conceptually similar constructs (Voorhees et al. 2016). Table 4 shows that all HTMT ratios are either lower than 0.803 or 0.837, therefore the measurement models depict discriminant validity as per Hair et al. (2019).

TABLE 4. HTMT Ratios

Constructs	DFL	FR	PFWB
DFL			
FR	0.512		
PFWB	0.333	0.803	
PFC	0.440	0.837	0.746

**4.3. Assessment of structural model.** The standard assessment criteria to evaluate the structural model involves collinearity diagnostics, the coefficient of determination ( $R^2$ ), the cross-validated redundancy measure ( $Q^2$ ), and the statistical significance of the path coefficients (Hair et al. 2018).

**4.3.1. Predictive accuracy.** We assess the strength of the coefficient of determination using the  $R^2$  to measure the model's explanatory power (Shmueli et al. 2019).  $R^2$  values are presented in Table 3, and the findings reveal that PFC has a weak ( $r^2 = 0.210$ ), and both FR ( $r^2 = 0.512$ ) and PFWB ( $r^2 = 0.533$ ) have moderate explanatory power. Table 3 also presents the  $Q^2$  values for the endogenous constructs and concludes that the proposed research model has predictive relevance as all the values are  $> 0$  (Hair et al. 2019).

**4.3.2. Hypotheses testing.** We test the hypotheses using a bias-corrected and accelerated (BCa) bootstrapping procedure with 5000 sub-samples. The results of the structural relationships are presented in Figure 2 and Table 5. In Figure 2, the outer model indicates outer weights/loadings and p-values, the inner model presents path coefficients and p-values, and the constructs depict the average variance extracted.

To test the statistical significance of the structural paths, we examine the t-statistic and confidence interval (CI). Under the CI approach, a path is significant if no definite zero is found between the upper and lower bounds. Figure 2 and Table 5 show that DFL has a positive and significant total impact on PFWB ( $B = 0.372$ ,  $t = 6.954$ ,  $CI = 0.241, 0.456$ ). Thus, H1 is supported, entailing that DFL positively contributes to the PFWB. Concerning the mediated relationships, the indirect association of DFL with PFWB through PFC as a mediator is positively significant ( $B = 0.201$ ,  $t = 4.224$ ,  $CI = 0.111, 0.291$ ). Further, the indirect association of DFL with PFWB through FR is also positive as well as significant ( $B = 0.073$ ,  $t = 2.764$ ,  $CI = 0.031, 0.133$ ). Therefore, H2 and H3 are supported. Finally, the indirect association of DFL and PFWB through serial mediators; PFC and FR, is also positively significant ( $B = 0.273$ ,  $t = 6.697$ ,  $CI = 0.261, 0.458$ ). Therefore, H4 is supported. Moreover, we also find that in the presence of PFC and FR, the direct effect of DFL on PFWB becomes insignificant ( $B = 0.001$ ,  $t = 0.019$ ,  $CI = -0.112, 0.117$ ). Thus, we assert that PFC and FR fully and positively

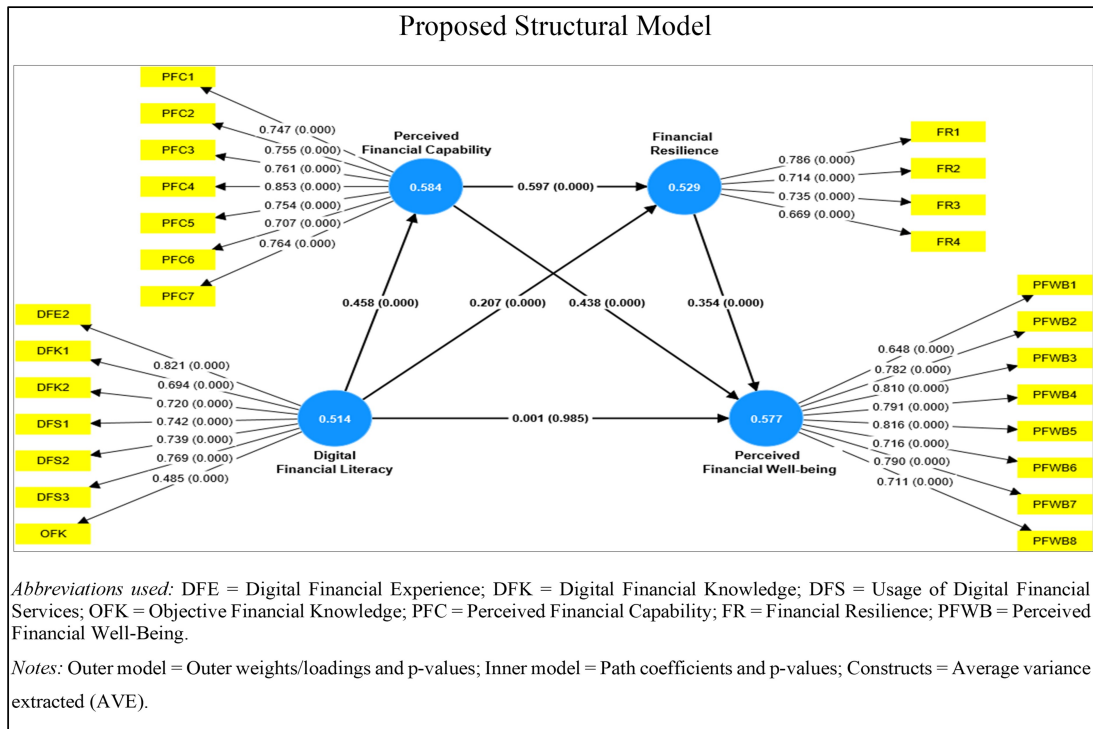


FIGURE 2. Proposed structural model. (Source: Author’s work)

mediate the relationship between DFL and PFWB, and PFC is the stronger mediator than FR. The results of hypotheses testing are presented in the Table 5 as below:

TABLE 5. Structural Model Results

Structural Paths	$\beta$	t-statistic	95% Bias-Corrected CI (LB, UB)	Result
H1: DFL → PFWB	0.372	6.954*	(0.241, 0.456)	Fail to reject
H2: DFL → PFC → PFWB	0.201	4.224*	(0.111, 0.291)	Fail to reject
H3: DFL → FR → PFWB	0.073	2.764*	(0.031, 0.133)	Fail to reject
H4: DFL → PFC → FR → PFWB	0.273	6.697*	(0.261, 0.458)	Fail to reject

*Note:* \* $p < 0.01$ ;  $\beta$  = Beta coefficient; CI = Confidence Interval; LB = Lower Bound; UB = Upper Bound.

Having substantiated the model’s explanatory power, statistical significance, and relevance of the path coefficients, we perform PLS-predict to assess the model’s out-of-sample predictive power (Hair et al. 2019). We run PLS-predict with 10-folds and 10 repetitions on the endogenous construct; PFWB. If  $Q^2$ -predict values  $\geq 0$ , it indicates that the model outperforms the most naïve benchmark, and has predictive relevance (Shmueli et al. 2019). Table 6 summarizes the PLS-predict results, showing that the  $Q^2$ -predict value for PFWB and all its indicators (except PFWB1) has predictive relevance. We use root mean square error (RMSE) to assess the predictive power as PLS error showed a normal distribution. The findings indicate that the model has low predictive power as a majority of the indicators produce higher prediction errors compared to the naïve linear-regression model (LM) benchmark.

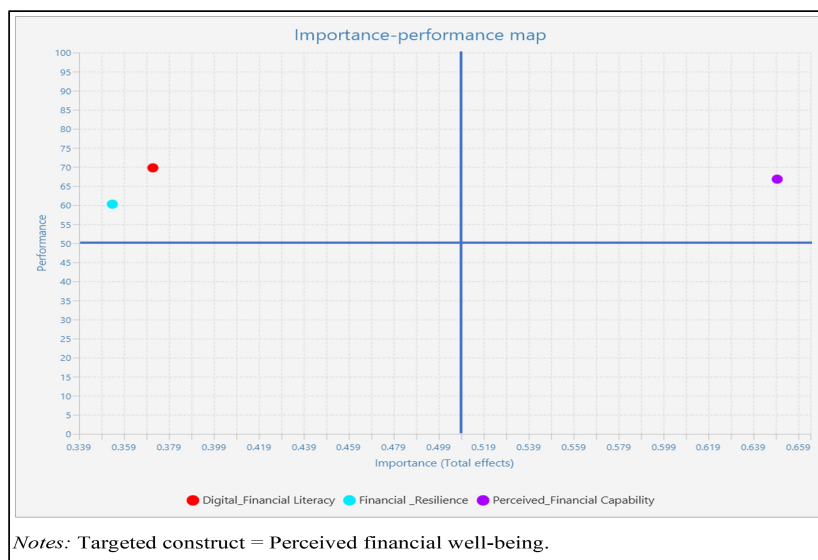


FIGURE 3. IPMA results. (Source: Author's work)

TABLE 6. PLS-Predict Results

Construct/ Indicators	PLS_RMSE	LM_RMSE	Difference	$Q^2_{\text{Predict}}$
Perceived financial well-being				0.121
PFWB1	1.077	1.077	0.000	-0.004
PFWB2	0.999	1.017	-0.018	0.075
PFWB3	0.905	0.864	0.041	0.112
PFWB4	0.975	0.940	0.035	0.042
PFWB5	0.952	0.926	0.026	0.109
PFWB6	0.921	0.922	-0.001	0.110
PFWB7	0.977	0.964	0.013	0.083
PFWB8	1.045	1.031	0.000	0.006

Note: RMSE = Root Mean Squared Error.

**4.4. Importance performance map analysis (IPMA).** Figure 3 and Table 7 present the results of the IPMA analysis. IPMA results offer important insights into the role of antecedent constructs and their relevance for managerial actions by examining the importance and performance of constructs concerning the model's key endogenous constructs (Ringle and Sarstedt 2016). The x-axis represents the importance of DFL, PFC, and FR in explaining the target construct PFWB, while the y-axis shows the performance of DFL, PFC, and FR in terms of their average rescaled latent variable scores. The results show that in comparison with other constructs, PFC has the highest perceived importance, followed by DFL and FR as perceived by the respondents. With a total effect of 0.65, PFC's importance is particularly high suggesting that a one-unit increase in PFC's performance from 66.80 to 67.80 would increase the performance of PFWB by 0.65 points. Furthermore, although DFL and FR both have above-average performance, they have relatively lower importance than PFC, implying that respondents perceive low importance of FR and DFL in influencing their PFWB.

TABLE 7. IPMA Results

Target PFWB	Construct:	Total Effects	Performance (%)
	DFL	0.372	69.77
	FR	0.354	60.24
	PFC	0.650	66.80

## 5. DISCUSSION AND IMPLICATIONS

H1 states that DFL has a significant influence on PFWB. The finding supports our hypothesis that knowledge of basic financial concepts, experience in the use of DFS/tools, and awareness about digital risk mitigation strategies positively contribute to PFWB. Our results are consistent with the ‘goal framing theory’ and prior studies (Xiao, Chen, and Chen 2014b; Kumar et al. 2022). Further, the results of descriptive statistics highlight the need to improve the DFL of adolescents and young adults. To this end, digital technologies can be utilised for the delivery of DFL and developing programs that aim to empower adolescents and young adults with enhanced financial capability. H2 and H3 examine the mediating role of PFC and FR respectively. We find positive and statistically significant indirect effects on the association between DFL and PFWB. Concerning H2, the results are in congruence with the capability approach and the self-efficacy theory. Digital literacy becomes even more pertinent since easier access to credit markets is likely to increase the risk of adolescents and young adults falling into a debt trap or suffering potential losses if their borrowing and investing decisions are not supported with due consideration to risk mitigation strategies. Also, financial education programs coupled with other interventions such as financial counselling and digital skills can show promising results (CFPB 2015; Xiao et al. 2016). The result of H3 supports the findings of Kass-Hanna, Lyons, and Fan (2022), which report that DFL is a key factor in building inclusiveness and FR. Additionally, our findings reveal that the level of FR is relatively lower than PFC, and there are significant differences in FR in terms of income and the number of earning members in the family. The results of IPMA conclude that FR has not garnered due attention concerning the role it plays in improving adolescents and young adults’ PFWB. Therefore, we suggest policy be directed towards improving DFL as it can promote financial practices that promote financially resilient behaviours (OECD 2021). With the right mix of hedonic and utilitarian elements, gamification of digital banking can be used as a strategy to develop desirable financial behaviour such as keeping sufficient savings to meet living expenses, saving for emergency/ unexpected expenses, and building social support. H4 reports a positive and complete serial mediation of PFC and FR, as the direct impact of DFL on PFWB becomes insignificant. These results are consistent with the theory of planned behaviour. This suggests that digital literacy (DL) coupled with financial literacy (OFK) results in digital financial literacy which significantly impacts financial capability. Financially capable individuals are likely to be more resilient as they adopt desirable financial behaviours towards savings and borrowings (such as budgeting and keeping sufficient savings to meet living expenses) and risk management strategies (preparedness for emergency expenses). These financially resilient behaviours lead to greater PFWB. The current research endeavour contributes to the literature by extending the existing strand of research to include FR in the relationship between PFC and PFWB and serves as an initial attempt that uses extensive empirical analyses to explore the associations among DFL, PFC, FR, and PFWB.

## 6. RESEARCH LIMITATIONS AND FUTURE DIRECTIONS

This study provides valuable insights into the role of PFC and FR in the relationship between DFL and PFWB. Although the study carries unique contributions to the domain of personal finance, it has the following shortcomings. First, the survey sample of this study is restricted

to the adolescents and young adults of the Punjab region only. Thus, researchers need to be cautious while generalizing the results of the study. Second, the study uses self-reported measures to capture respondents' perception which may differ from their actual behaviour. Also, the study has used PLS-SEM to test the proposed hypotheses, thus, the methodological shortcomings of PLS-SEM also apply to our research as well. Third, this study majorly focuses on the factors that play a positive role in DFL's influence on PFWB, therefore, future studies may focus on the negative factors such as financial fragility affecting this mechanism. Fourth, future studies can explore more rigorous and complex models by introducing control variables. Finally, the present study reflects the findings in the context of a developing country, future studies can involve participants from both developed and emerging countries to ascertain similarities and differences.

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