Financial literacy, personality traits and financial wellbeing: A preliminary evidence

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Abstract

This paper explores how financial literacy and personality traits affect the financial wellbeing of individuals in the emerging economy of Pakistan. Using a structured questionnaire, Data were collected using online survey from 542 participants; 367 of the total responses were validated and analysed using Structural Equation Modeling (SEM). The direct impact of perceived and actual financial literacy on financial wellbeing is positively significant. Credit card behaviour partially mediates the relationship between financial literacy and financial wellbeing. The individuals' social relationships have shown a significantly positive impact on financial wellbeing, while emotional instability shows a significantly negative impact. This study offers insights for researchers, managers and policy makers to understand how financial wellbeing at the micro level can be increased by introducing effective financial literacy and personality training programs.

1. Introduction

Financial wellbeing is usually misperceived and associated with the amount of wealth individuals earn or possess. However, financial wellbeing does not necessarily depend upon how much money an individual earns, but rather what behaviour an individual holds toward that money[1]. Individuals having same level of income may not have the same level of financial wellbeing, as they hold varying personal values and characteristics (Tanoto & Evelyn, 2019). The idea that a person's values and financial behaviour determine financial wellbeing is supported in multiple studies (Santos, Mendes-Da-Silva, Flores, & Norvilitis, 2015; Cordova & García-Santillán, 2017; Moriarty, 2018). Academics, practitioners, and policy makers around the world agree on the importance of financial literacy and positive financial behaviors, which can result in raising financial wellbeing (Kristoffersen, 2019; CFPB, 2015). Studies indicate that certain debt and credit experiences have strong negative associations with financial wellbeing. For example Donnelly et al. (2018) maintain that excessive use of credit cards harm individual's financial wellbeing. Thus, financial wellbeing is an outcome of multiple explanatory factors such as financial literacy, credit card behaviors, and personality traits.

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[1] According to an independent survey of more than ten thousand employees across multiple industries in UK, 40% have financial worries and are more likely to suffer from sleepless nights, unfinished daily tasks, and distressed relationships with co-workers and may have poor mental health. Astonishingly, many of them are earning more than 100 thousand pounds on yearly basis (FD, 2019). Similarly, approximately 33% of the U.S. adults surveyed had weak financial wellbeing score (equal of below to 50 out of 100), meaning they have a high probability of struggling to make ends meet and experiencing material hardship, which are indicators of financial dissatisfaction (CFPB, 2017).

The present study attempts to investigate the role of financial literacy, personality traits, credit card behaviorsin shaping financial wellbeing in the context of Pakistan, where little research has been carried out on the subject. We focus on Pakistan for two reasons. Firstly, most of the studies have focused on advanced economies (like US, UK, Australia and Germany etc.) to explored said relationships (e.g. (Nyhus & Webley, 2001; Gutter & Copur, 2011; (Fluellen, 2013; Santos et al., 2015; (Calcagno & Monticone, 2015; Allgood & Walstad, 2016; (Matz et al., 2016; Anderson, Baker, & Robinson, 2017). However, little is known about emerging economies like Pakistan. Secondly, financial wellbeing of a greater proportion of the population is severely affected in Pakistan where 25% of the population lives below the poverty line[2] (Mahmood, Yu, & Klasen, 2019). It has been further worsened by COVID-19. Moreover, financial literacy in Pakistan is quite low, as evident from the fact that only 13% of adults in Pakistan have a formal bank account, and only 5% of those are women (Fatima, 2019). This shows that low financial literacy could be one of the main causes of impaired financial wellbeing in Pakistan. Therefore, there is a serious need to investigate the level of financial wellbeing and how it is being affected by multiple factors.

In our study, data was collected online from 542 respondents through a structured questionnaire. After removing incomplete responses, 367 completed surveys were validated and analysed through structural equation modelling (SEM). This study provides the insights that how financial wellbeing of individuals can be increased by managing finances and is also a guideline for policy makers.

Outcomes of this study may help the business academicians and financial managers to understand the importance of financial literacy and personality traits to enhance financial wellbeing. It may assist the policy makers/ economists to launch effective financial literacy and personality development programs that may positively affect the financial wellbeing status of individuals. This study is structured as follows. Section 2 and its subsections review current literature and our proposed study model. Section 3 explains our research methodology including the research questionnaire. Section 4 analyses the results. Section 5 provides the conclusion.

2. Literature Review

2.1 Financial Literacy and Financial Wellbeing:

Financial literacy can be defined as the extent of an individual's abilities, skills, and knowledge on money-related matters, which enable him to make persuasive and sensible decisions and utilize financial resources in a suitable manner. Financial literacy improves financial performance level and may affect investment outcomes by encouraging the use of financial advice (Litterscheidt & Streich, 2020; Kadhum & Saidi, 2022). The investors with a high level of financial literacy recognize more the value of financial advice (Chauhan & Dey, 2020). In Germany, a study finds that people with higher financial literacy have greater financial

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[2] Some of the key reasons for increasing poverty in Pakistan are lack of financial management skills and sub-optimal behaviors towards savings, investment, and spending behaviors, which impair the financial wellbeing of the individuals (SBP, 2019). Furthermore, the effects of certain financial behaviors, financial literacy levels, and personality characteristics could be exacerbated when income levels are shrinking due to economic turmoil caused by the COVID-19 pandemic (Acikgoz & Gunay, 2020).

wealth (Bannier & Schwarz, 2018). According to CFPB (2015), the factors determining financial wellbeing are knowledge and skills, attitude. A study conducted in India finds a positive association between financial literacy and sound financial planning (Akhter & Sangmi, 2016). This enables individuals to plan better for their retirement, finance their children's education, and accumulate more assets at the time of retirement. Their study also finds that having a higher financial literacy level equips individuals to better assess risk and insure their assets. When individuals have a higher level of financial literacy, the burden on the financial system is lessened, as it reduces the under coverage of risk, increases insurance of assets, and reduces cost of insolvencies and bankruptcies. In the same Indian context, financial literacy plays a crucial role in reducing behavioural biases. With higher levels of financial literacy, individuals act more rationally and experience fewer behavioural biases such as overconfidence, self-attribution, disposition effect, anchoring, representativeness, mental accounting, and herding (Baker, Kumar, Goyal, & Gaur, 2019; Kadhum & Saidi, 2022). Numeracy, a subcomponent of financial literacy, significantly impacts financial decision making. A study conducted by Park & Cho (2019) finds that individuals with lower numeracy levels are more likely to become loss averse and make less optimal choices. Allgood and Walstad's (2016) segregates financial literacy into actual and perceived literacy.

The review of literature indicates that higher financial literacy results in greater financial wellbeing (Bannier & Schwarz, 2018; CFPB, 2015; Akhter & Sangmi, 2016; Baker et al., 2019) Therefore, based on the findings of Bannier & Schwarz (2018), CFPB (2015), Salignac, Hamilton, Noone, Marjolin, & Muir (2020), Akhter & Sangmi (2016) and Baker, Kumar, Goyal, & Gaur (2019).

However, the relationship between financial well-being and financial literacy can be complex and bidirectional. On the one hand, having a strong foundation of financial literacy can help people make better financial decisions and manage their money more effectively, which can lead to improved financial wellbeing. While on the other hand, financial stress and difficulties can also negatively impact a person's financial literacy. A study by the Financial Industry Regulatory Authority (FINRA) found that individuals who reported having difficulty making ends meet also had lower levels of financial literacy (FINRA, 2017). Financial stress may affect financial literacy. When people are struggling to make ends meet or are dealing with financial hardship, they may not have the time or resources to devote to learning about financial concepts and strategies. Likewise, a study by the National Endowment for Financial Education found that individuals who reported high levels of financial stress had lower financial literacy scores compared to those who reported low levels of financial stress (NEFE, 2018). In addition, financial stress can make it difficult to focus on learning, which can further exacerbate the problem. Therefore, it can be argued that, individuals who experience financial stress and insecurity tend to have lower levels of financial literacy. Improving financial literacy can lead to improved financial well-being, and improving financial well-being can also contribute to improve financial literacy. But merely, the focus of this cross-sectional study is to predict "financial wellbeing" of Pakistani individuals (as target outcome), the possible bidirectional causality between financial wellbeing and financial literacy will not jeopardize the conclusions. Therefore, in the view of above discussion, we develop the following hypothesis:

H_1: *Higher financial literacy has positive impact on financial wellbeing of individuals*

2.2 Financial Literacy, Credit Card Behaviour and Financial Wellbeing:

Credit cards provide a standby credit line for individuals in case of financial emergencies and serve as an easy payment method for spending. Many studies suggest that excess use of credit cards can pose risks to individuals' financial wellbeing (Santos, Mendes-Da-Silva, Flores, & Norvilitis, 2016; Cordova & García-Santillán, 2017; and Moriarty, 2018). Credit cards may cause overspending and transfer today's payments onto the next period's cash inflows. Also, cash withdrawals from credit cards are interest-based borrowings. A study conducted by Zhang and Kim (2019) on young American adults, finds an increase of 6% and 4% higher odds of distress in students when their loan and credit card debt increased by 1,000 USD. In Pakistan, credit card users are increasing, and credit card transactions were expected to reach a volume of Rs. 1 billion by the second quarter of 2021 (SBP, 2021). These studies suggest that excessive use of available credit line may negatively affect individuals' financial wellbeing. Additionally, Zhang and Kim (2019) critically evaluate links between financial behaviors and psychological distress and find that accumulation of credit card debt causes psychological distress.

Individuals' financial literacy has a significant impact on their financial behaviors. This is supported by Santos, Mendes-Da-Silva, Flores, & Norvilitis (2016), who find that positive credit card behaviors are significantly determined by higher financial literacy. Allgood and Walstad (2016) investigate negative behaviors regarding credit cards, including making only the minimum payment, facing penalties due to late payment, exceeding card limit, bearing higher interests on arrears. Their study asserts that financial literacy influences credit card behavior. Therefore, based on the empirical evidence presented by Calcagno and Monticone (2015), Fluellen (2013), Santos, Mendes-Da-Silva, Flores, & Norvilitis (2016), Allgood and Walstad (2016), Park and Cho (2019), Mahmood, Yu, & Klasen (2019), Anderson, Baker, & Robinson (2017) and Zhang and Kim (2019), financial literacy can affect individuals' credit card behaviors; the following hypothesis is proposed:

H_2: Higher financial literacy has positive impact on credit card behaviour of individuals.

Several empirical studies have shown the impact of financial behaviours on financial wellbeing (Limbu & Sato, 2019; Tanoto & Evelyn, 2019; Kempson & Poppe, 2018; Gutter & Copur, 2011; Bannier & Schwarz, 2018; CFPB, 2015; Salignac, Hamilton, Noone, Marjolin, & Muir, 2020; Akhter & Sangmi, 2016; Baker, Kumar, Goyal, & Gaur, 2019; Sabri et al., 2022). Furthermore, some other studies have found a significant impact of financial literacy and financial behaviour on financial wellbeing (Prakash et al., 2022)

Our literature review suggests that financial literacy has an indirect relationship with financial wellbeing through financial behaviors. For instance, Limbu and Sato (2019) study focuses on literacy related to credit cards, and they find that credit card literacy positively affects financial efficacy, which, in turn, positively affects financial wellbeing. Some more complex interrelationships among financial knowledge, financial wellbeing, and financial behaviors are explored by Tanoto and Evelyn (2019) in the Indonesian context. Another study commissioned by Kempson & Poppe (2018) in Norway finds that individuals' financial wellbeing is directly affected by financial behaviors, financial confidence and control. Gutter and Copur (2011) link

financial behaviors with financial wellbeing, finding a strong relationship between both in the context of the U.S. Their results indicate that individuals with positive financial behaviors enjoy higher financial wellbeing. In Gutter and Copur's (2011) study, the results of means comparisons show that various socioeconomic factors and financial behaviors have significant impacts on financial wellbeing. Moreover, Ortiz (2018) finds that financial behaviors of older U.S. adults are significantly related to their objective financial situation, which further has a strong relationship with their perceived financial wellbeing.

Therefore, based on above findings and the relationships hypothesized in Hypotheses 1 and 2, it can be argued that credit card behaviors plays as a mediator between financial literacy and financial wellbeing; therefore, the following hypothesis is proposed.

H_3: Higher financial literacy will foster positive credit card behaviour (prudent spending) which will positively affect individuals' financial wellbeing.

2.3 Personality Traits, Credit Card Behavior and Financial Wellbeing

Several studies document the fact that personality traits affect the financial wellbeing of individuals (Donnelly, Iyer, & Howell, 2012; Kempson & Poppe, 2018; Ghaffar et al., 2022). For instance, neuroticism, a personality trait which represents emotional instability, may cause higher debt (Nyhus & Webley, 2001) and more frequent compulsive buying (Brougham, Jacobs-Lawson, Hershey, & Trujillo, 2011) especially when paying through credit cards which causes overspendings and undue expenditures. Such behaviors are considered to be negative[3]. This study suggests that, the individuals with dominant neuroticism trait will keep negative credit card behaviours. On the other hand, individuals with dominant conscientiousness trait saves more (Brandstatter, 2005), are less inclined toward compulsive buying (Mowen & Spears, 1999), and they manage finances effectively (Wicaksono et al., 2022). These behaviors are to be considered as positive ones. A recent study finds that individuals who believe that material possessions can provide happiness are less likely to manage their money well, whereas individuals with higher levels of conscientious are more likely to manage their money well, as they demonstrate more positive financial attitudes (Donnelly, Iyer, & Howell, 2012) which resultantly affect financial wellbeing. Moreover, a study by Kempson and Poppe (2018) also indicates a significant positive impact of personality traits on financial wellbeing. Based on the findings of the above cited studies, it can be argued that a relationship between personality traits and financial wellbeing exists; therefore, the following hypothesis is developed. We also proposed that the credit card behaviour mediates the relationship between personality traits and financial wellbeing.

H_4: Personality traits will affect credit card behaviour which will affect individuals' financial wellbeing.

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[3] It can be argued that financial trouble can lead to emotional instability and poor social relationships but it doesn't fall under the study's objective (i.e. Financial Wellbeing). Often the terms "financial wellbeing", "financial distress" and "financial trouble" get mixed with each other. However, financial wellbeing is a state of mental financial satisfaction (no matter how much wealth an individual holds), while financial distress is its opposite, and financial trouble is linked with the shortage of funds which may cause psychological distress (Prawitz et al., 2006; Ryu & Fan, 2022).

3. Research Methodology

In econometric terms, we can represent our model as follow:

$$FW = \alpha_0 + \alpha_1 FL + \alpha_2 PT + \alpha_3 CCB + \varepsilon_1 \qquad \ldots\ldots\ldots\ldots\ldots\ldots\ldots (1)$$

$$CCB = \beta_0 + \beta_1 FL + \beta_2 PT + \varepsilon_2 \qquad \ldots\ldots\ldots\ldots\ldots\ldots\ldots (2)$$

Where FW = Financial Wellbeing, FL = Financial Literacy, PT = Personality Traits, CCB = Credit Card Behavior, α_0 and β_0 are constants. α_1, $\alpha_2, \beta_1, \beta_2$ are co-efficients. ε_1 and ε_2 are the error terms.

The method of data collection employed in this study is the structured questionnaire. Unlike semi-structured or unstructured interviews, a structured questionnaire works best with standardized questions interpreted in the same way by all, and therefore, tends to be used for descriptive or explanatory research (Saunders et al., 2016). To approach the right respondents for unbiased data collection process while keeping in consideration the ongoing COVID-19 pandemic and the associated lockdown measures, we target earning individuals from metropolitan cities (figure 1). For this purpose, we hire research volunteers from academic institutions across multiple cities to ensure willful participation from those respondents who meet eligibility criteria (i.e. earning individual, minimum experience, minimum age). After giving them a one day training on identifying relevant respondents & data collection process, online Google form link had been provided to them. Before sharing the link with the respondents, our volunteers explained the purpose of the research to the respondent and get their consent. In case of agreeing, link was provided and then each respondent gets login on Google form from his/her own device/email for submitting response.
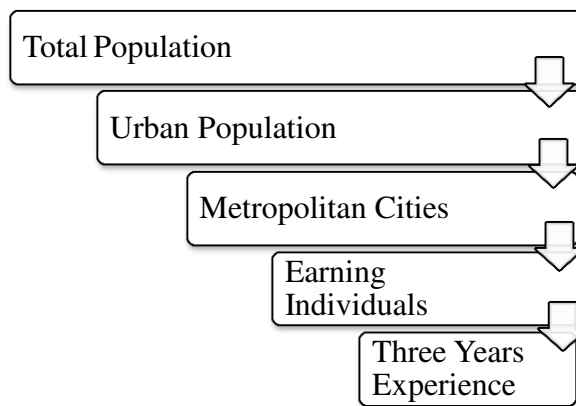

Figure-1: Sampling

The sample included people who have established an earning income for 3 years or more and who were aged 18 or older. All responses from those experiencing less than three years of established earnings were eliminated. Appendix A shows the type of questions used, their

definitions, and how we coded them. To analyse and investigate the described study model, which assesses the impact of financial literacy (both actual and perceived), personality traits, and credit card behaviour on financial wellbeing, we applied structural equation modelling (SEM) using Smart-PLS version 3.0. Prior to running that model, we carefully imported data in Smart-PLS and ensured its normality, validity, and reliability.

4. Preliminary Results
4.1 Descriptive Statistics

Table-I shows the demographic profile of the sample in terms of number of observations and the mean for each variable. After eliminating incomplete responses from the full sample of 542 responses, we ended up with 367 complete observations which is an acceptable sample size when the population is unknown (Shete et al., 2020). For example, if a respondent had less than 3 years earning experience, his/her form was eliminated. Similarly, if a respondent did not have a credit card, he/she could not answer credit card related questions. In such cases, the form was immediately shifted to the next section by automatically calculating the credit card score as zero. As for demographics, respondents were more likely to be male, aged below 40, married, have a full-time job, have a college degree, have at least one dependent, and live with a partner/spouse. We compare the sample mean of the financial wellbeing score against each respondent's score and found over 54% have low financial wellbeing scores. This large percentage was expected because a big chunk of the total population lives below the poverty line (Mahmood, Yu, & Klasen, 2019). As far as income level is concerned, 36.78% of the respondents earn between 25K and 50K.

TABLE-I: Demographic Profile of the Sample

Profile		*n*	*%*
Occupation	Doing Job	243	66.21
	Doing Business	104	28.34
	Doing Nothing	20	5.45
Experience	3 to 5 years	140	38.15
	5 to 10 years	79	21.53
	10 to 15 years	50	13.62
	15 and above	98	26.70
Gender	Male	326	88.83
	Female	41	11.17
Age Group	18 to 30	162	44.14
	31 to 40	85	23.16
	41 to 50	77	20.98
	Above 50	43	11.72
Education	PhD	12	3.27
	M.Phil.	49	13.35
	Masters	99	26.98

	Graduate	89	24.25
	Inter	57	15.53
	Matric	61	16.62
Income Group	Up to PKR 25,000 a month	67	18.26
	Between PKR 25,000 and PKR 50,000 a month	135	36.78
	Between PKR 50,000 and PKR 100,000 a month	75	20.44
	PKR 100,000 or more a month	40	10.90
	Prefer not to answer	50	13.62
Marital Status	Single	120	32.70
	Married	240	65.40
	Divorced/Separated	7	1.91
Dependents	Zero Dependents	127	34.60
	One Dependent	38	10.35
	Two Dependents	50	13.62
	Three Dependents	64	17.44
	Four Dependents	43	11.72
	Above Four Dependents	45	12.26

4.2 Data Normality, Discriminant Validity and Multicollinearity:

Although data normality is not a matter of concern while using SEM, we care about this aspect. The data was normally distributed as the value of kurtosis and skewness falls between the acceptable ranges of ±3 for the concerned variables. Also, the standard deviation was closer to 1 for all variables. We adopted two criteria to confirm discriminant validity. At first, we follow the Fornell-Larcker criterion to check the discriminant validity. The weight of the covariate against each variable was less than from the square root of the AVE score, which is 1 in this case. See Appendix B. In addition to this, we also follow the Hetrotrait-monotrait ratio criteria (Henseler et al., 2014), which requires that the weight across the variables must be less than 0.85 to ensure that all the constructs in the model are different from each other, hence proved (see Appendix C). Along with this, we also test multicollinearity through the variance inflation factor (VIF)[4], as the correlation between predictors can adversely affect the regression results. According to the rule of thumb, the independent value of VIF against each predictor is much closer to 1, which proves the absence of multicollinearity. Also, the mean VIF is less than 5, which ensure reliable results (Table-II). Furthermore, the correlation matrix for all the variables is given in Appendix D for support.

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[4] Variance inflation factor (VIF) is a measure of the amount of multicollinearity in a set of multiple regression variables. Mathematically, the VIF for a regression model variable is equal to the ratio of the overall model variance to the variance of a model that includes only that single independent variable. This ratio is calculated for each independent variable. A high VIF indicates that the associated independent variable is highly collinear with the other variables in the model.

TABLE-II: Multicollinearity Test

Collinearity Statistics	VIF
Actual-FL	1.06
CC_Score	1.07
FWB_Sum	1.12
PT-Agreeableness	1.17
PT-Conscientiousness	1.10
PT-Extraversion	1.08
PT-Neuroticism	1.17
PT-openness	1.08
Perceived-FL	1.06
Mean VIF	**1.10**

4.3 Model Fitness:

Partial Least Square (PLS) path modelling's tests of model fit depend on the bootstrap to conclude the probability of attaining a discrepancy among the empirical and the model-implied correlation matrix (Dijkstra & Henseler, 2015). We use multiple criteria to obtain the model fit. The standardized root mean square residual (SRMR) is defined as the difference among the observed correlation and the model implied correlation matrix, which permits, weighing the average magnitude of the discrepancies between observed and expected correlations, as an absolute measure of (model) fit criterion. A value less than 0.08 (Hu & Bentler, 1998; Henseler et al., 2014) is considered a good model fit. In our case, the value for SRMR is 0.015, which is acceptable as a good model fit. The second criterion we use for model fit is normed fit index (NFI). Usually, the value of NFI above 0.9 represents acceptable fit. In our case, its value is 0.976, which shows a good model fit. Also, for the chi-square approximation to be valid, the expected frequency should be at least 5. In our case, the value is 3.84, which is acceptable. Hence, the data fits the model well.

4.4 Regression Results & Mediation Analysis:

We specified multivariate regression to investigate the relationship between financial wellbeing, financial literacy, and personality traits. Our findings indicate a significant impact of actual financial literacy, extraversion, neuroticism and income group on financial wellbeing. The specified model carries approximately a 14% explanation capacity in the dependent variable as the value of R^2 is 13.7% at a 1% significant level. Actual and Perceived financial literacy have a significant positive impact on financial wellbeing, with coefficient values ($\beta = 0.096$, t = 1.941, $\rho = 0.027$) and ($\beta = 0.458$, t = 2.37, $\rho = 0.018$) respectively. The higher beta value in case of perceived financial literacy is the result of self-confidence about financial knowledge; therefore, our findings support Hypothesis 1: Higher the financial literacy, higher will be the financial

wellbeing. Similarly, extraversion also has a significant positive impact on financial wellbeing with values (β = 0.164, t = 3.178, ρ = 0.001). On the other hand, the impact of neuroticism was also significant but has a negative impact with values (β = -0.145, t = 2.716, ρ = 0.003), which supports Hypothesis 4: Personality traits effect the financial wellbeing of individuals. Other personality traits, including agreeableness, conscientiousness, and openness are found to be insignificant, as the confidence interval is greater than the acceptable threshold values.

We also control the effect of gender and income of the individuals on their financial wellbeing. For this purpose, we use dummy variables for gender and for each income group. The results were interestingly significant. The impact of the lowest income group (i.e., up to 25K) and the higher income group (i.e. 100K and above) on financial wellbeing was significant with values (β = -1.296, t = -2.47, ρ = 0.013) and (β = 1.031, t = 1.8000, ρ = 0.072) respectively, while the middle income groups remain insignificant (Table-III). The minimum wage declared by the state has negative impact on financial wellbeing of individuals, while income of 100K and above (often considered as desired income among many individuals in Pakistan) has significant positive impact on financial wellbeing. These results indicate that individuals with a maximum income of 25K are facing financial hardships, while individuals with an income of 100K and above remain with some spare funds for investment and savings, which increase their short-term and long-term financial satisfaction. Moreover, the effect of gender was insignificant.

TABLE-III: Statistical Results

Coefficients	Mean Coefficient	Standard Deviation (STDEV)	t-stat	p-value
Actual_FL -> Financial_WB	0.096	0.051	1.941	0.027**
Perceived_FL -> Financial_WB	0.458	0.193	2.370	0.018**
Agreeableness -> Financial_WB	-0.078	0.059	1.337	0.147
Conscientiousness -> Financial_WB	-0.029	0.059	0.486	0.313
Extraversion -> Financial_WB	0.164	0.051	3.178	0.001***
Neuroticism -> Financial_WB	-0.145	0.054	2.716	0.003***
Openness -> Financial_WB	0.034	0.058	0.576	0.282
gender -> Financial_WB	-0.347	0.568	-0.610	0.542
up to 25K -> Financial_WB	-1.296	0.524	-2.470	0.013**
25K to 50K -> Financial_WB	-0.115	0.483	-0.240	0.812
50k to 100K -> Financial_WB	-0.509	0.560	-0.910	0.364
100K and above -> Financial_WB	1.031	0.572	1.800	0.072*
Mediation Analysis				
Direct Effect				
Actual_FL -> Financial_WB	0.072	0.049	1.935	0.076*
Neuroticism -> Financial_WB	-0.130	0.061	1.984	0.037**
Total Effect				
Actual_FL -> CC_Behaviour	-0.141	0.047	3.023	0.001***
Neuroticism -> CC_Behaviour	0.190	0.057	2.93	0.007***

CC_Behaviour -> Financial_WB	-0.183	0.047	3.92	0.000***

Indirect Effect

Actual_FL -> CC_Behaviour -> Financial_WB	0.026	0.011	2.343	0.020**
Neuroticism -> CC_Behaviour -> Financial_WB	-0.251	0.037	2.176	0.013**

R-Square	Value	P values
CC_Behaviour	0.022	0.067*
Financial_WB	0.129	0.001***

With respect to analysing the mediating role of credit card behaviour[5] on the linkage between financial literacy, personality traits and financial wellbeing, mediation analysis was performed. Results reveal that the direct effect of financial literacy and neuroticism on financial wellbeing is significant with values (β = 0.072, t = 1.935, ρ = 0.076) and (β = -0.130, t = 1.984, ρ = 0.037) respectively; see Table-III. With the inclusion of credit card behaviour (the indirect effect), the impact of financial literacy on financial wellbeing remains significant (β = 0.026, t = 2.313, ρ = .010) and the impact of neuroticism on financial wellbeing also remains significant (β = -0.251, t = 2.176, ρ = 0.013) respectively, which proves partial mediation for both; therefore, we accept our third and fourth hypothesis, i.e. Credit Card behaviour mediates the linkage between financial literacy and financial wellbeing & between neuroticism and financial wellbeing. Mediation contributes approximately 20% of the overall value of R-square for the model.

In respect to the total effect, we find that actual financial literacy has a significant negative impact on credit card behaviour, with values (β = -0.141, t = 3.023, ρ = 0.001) which supports Hypothesis 2: The higher an individual's financial literacy, the fewer negative credit card behaviors will be displayed. Also, credit card behaviors have a significant negative impact on financial wellbeing, with values (β = -0.183, t = 3.92, ρ = 0.000), so, we also accepted Hypothesis 3: Individuals participating in negative credit card behaviors will experience lower financial wellbeing. In respect to the total effect of neuroticism, we find that neuroticism has a significant positive impact on credit card behaviour, with values (β = 0.190, t = 2.93, ρ = 0.007) which shows that an individual with neuroticism will engage more in negative credit card behaviors, resultantly their financial wellbeing will suffer negatively. Therefore, we also accepted Hypothesis 4: Personality traits will affect credit card behaviour which will affect individuals' financial wellbeing. We don't find the mediating role for the rest of the personality traits, and therefore omitted.

5.0 Conclusion

This study has much practical significance in the Pakistani context because a large portion of the population has low financial literacy. Financial literacy and personality traits both play a significant role in defining the financial wellbeing of an individual. Financial wellbeing is an integral part of overall wellbeing, and it can be raised by ensuring positive financial behaviors,

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[5] For the purpose of analysing the mediating role of credit card behaviour between financial literacy and financial wellbeing, we only consider those respondents who hold credit card.

which are further linked to the level of financial literacy. Higher financial literacy brings greater financial wellbeing and this effect is multiplied in the case of those individuals who are more confident above their financial knowledge. Negative credit card behaviour negatively impacts financial wellbeing and partially mediates the relationship of financial literacy and financial wellbeing. Also, individuals with different personality traits may experience different levels of financial wellbeing because personality traits encourage varied behaviors resulting in different outcomes. The individuals' social skills have shown a significantly positive impact on financial wellbeing, while emotional instability shows a significantly negative impact. Additionally, it is necessary to revise the minimum income as it is contributing negatively to the financial wellbeing of individuals.

Therefore, this study will help regulators and practitioners understand the root causes of low financial wellbeing, which are associated with low financial literacy, negative financial behaviors, and personality issues. It will also help academics better understand the financial decision-making phenomenon and the factors which determine financial wellbeing in the context of a developing country. Outcomes of this study may help the business academicians and financial managers to understand the importance of financial literacy and personality traits to enhance financial wellbeing. It may assist the policy makers/ economists to launch effective financial literacy and personality development programs that may positively affect the financial wellbeing status of individuals. As of limitation, the literature highlighted the possible two way causality between financial literacy and financial wellbeing, however, as we use cross sectional data to investigate the hypothesis of the study, thus the unidirectional exploration was possible. Therefore, this study suggest a longitudinal study to explore this two way causality by incorporating mediators like cost and time as future research agenda. Future researchers may also extend this study to check the mediating role of financial behaviors between personality traits and financial wellbeing.

References:

Akhter, A., & Sangmi, M.-u.-D. (2016) "Relationship between financial literacy and personal financial wellbeing: an empirical study" *Abhigyan*, *34*(3), 37-47.

Allgood, S., & Walstad, W. B. (2016) "The effects of perceived and actual financial literacy on financial behaviors" *Economic inquiry*, *54*(1), 675-697.

Anderson, A., Baker, F., & Robinson, D. T. (2017) "Precautionary savings, retirement planning and misperceptions of financial literacy" *Journal of financial economics*, *126*(2), 383-398.

Baker, H. K., Kumar, S., Goyal, N., & Gaur, V. (2019) "How financial literacy and demographic variables relate to behavioral biases" *Managerial Finance*, 124-146.

Bannier, C. E., & Schwarz, M. (2018) "Gender-and education-related effects of financial literacy and confidence on financial wealth" *Journal of Economic Psychology*, *67*, 66-86.

Brandstätter, H. (2005) "The personality roots of saving—Uncovered from German and Dutch surveys" In *Consumers, Policy and the Environment A Tribute to Folke Ölander* (pp. 65-87). Springer, Boston, MA.

Brougham, R. R., Jacobs-Lawson, J. M., Hershey, D. A., & Trujillo, K. M. (2011) "Who pays your debt? An important question for understanding compulsive buying among American college students" *International Journal of Consumer Studies*, *35*(1), 79-85.

Calcagno, R., & Monticone, C. (2015) "Financial literacy and the demand for financial advice" *Journal of Banking & Finance*, *50*, 363-380.

CFPB (2017) "Financial Wellbeing in America: New York" *Consumer Financial Protection Bureau*, USA.

CFPB (2015) "Financial well-being: The goal of financial education" *Consumer Financial Protection Bureau*, USA. Retrieved from https://files.consumerfinance.gov/f/201501_cfpb_report_financial-well-being.pdf

Chauhan, Y., & Dey, D. K. (2020) "Does financial literacy affect the value of financial advice? A contingent valuation approach" *Journal of Behavioral and Experimental Finance*, 25, 100268.

Cordova-Rangel, A., & García-Santillán, A. (2017) "Credit cards in Mexico: Correct use of plastic money" *Ecoforum Journal*, *6*(3).

Dewees, S., & Mottola, G., (2017) "Race and Financial Capability in America: Understanding the Native American Experience" *FINRA Investor Education Foundation*. Retrieved from https://www.finrafoundation.org/sites/finrafoundation/files/A-Snapshot-of-Investor-Households-in-America_0_0_0.pdf

Dijkstra, T. K., & Henseler, J. (2015) "Consistent and asymptotically normal PLS estimators for linear structural equations" *Computational statistics & data analysis*, *81*, 10-23.

Donnelly, G., Iyer, R., & Howell, R. T. (2012) "The Big Five personality traits, material values, and financial well-being of self-described money managers" *Journal of Economic Psychology*, *33*(6), 1129-1142.

Fatima, S. (2019) "Financial literacy in Pakistan" *The Express Tribune*. Retrieved September 19, 2019, from https://tribune.com.pk/story/1949358/6-financial-literacy-pakistan/

Fluellen, V. M. (2013) "Exploring the relationship between financial behaviors and financial well-being of African American college students at one historically black institution" *Iowa State University,* Ames, Iowa.

Ghaffar, J. A., Khattak, M. S., Shah, T. A., & Jehangir, M. (2022) "Impact of personality traits on financial planning: an empirical evidence from Pakistan" *Journal of Economic and Administrative Sciences*.

Gutter, M., & Copur, Z. (2011) "Financial behaviors and financial well-being of college students: Evidence from a national survey" *Journal of family and economic Issues*, *32*(4), 699-714.

Henseler, J., Dijkstra, T. K., Sarstedt, M., Ringle, C. M., Diamantopoulos, A., Straub, D. W., Ketchen, D. J., Hair, J. F., Hult, G. T. M., and Calantone, R. J. (2014) "Common Beliefs and Reality about Partial Least Squares: Comments on Rönkkö & Evermann" *Organizational Research Methods*, 17(2): 182-209.

Hu, L. T., & Bentler, P. M. (1998) "Fit indices in covariance structure modeling: Sensitivity to underparameterized model misspecification" *Psychological methods*, *3*(4), 424-453.

Kadhum, H. J., & Saidi, H. K. (2022) "Behavioral Biases and their Impact on Financial Performance in the Context of Financial Literacy: A Literature Review" *World Bulletin of Management and Law*, *11*, 38-49.

Kempson, E., & Poppe, C. (2018) "Understanding financial well-being and capability. A revised model and comprehensive analysis" *Consumption Research Norway (SIFO),* Oslo Metropolitan University.

Kristoffersen, I. (2018) "Great expectations: Education and subjective wellbeing" *Journal of Economic Psychology*, *66*, 64-78.

Limbu, Y. B., & Sato, S. (2019) "Credit card literacy and financial well-being of college students: A moderated mediation model of self-efficacy and credit card number" *International Journal of Bank Marketing*.

Litterscheidt, R., & Streich, D. J. (2020) "Financial education and digital asset management: What's in the black box?" *Journal of Behavioral and Experimental Economics*, 87, 101573.

Mahmood, T., Yu, X., & Klasen, S. (2019) "Do the poor really feel poor? Comparing objective poverty with subjective poverty in Pakistan" *Social Indicators Research*, *142*(2), 543-580.

Matz, S. C., Gladstone, J. J., & Stillwell, D. (2016) "Money buys happiness when spending fits our personality" *Psychological science*, *27*(5), 715-725.

Moriarty, J. (2018) "Risky Pay and the Financial Crisis: Who's Responsible?" *Midwest Studies in Philosophy*, *42*, 156-173.

Mowen, J. C., & Spears, N. (1999) "Understanding compulsive buying among college students: A hierarchical approach" *Journal of Consumer Psychology*, *8*(4), 407-430.

NEFE (2018) "Financial Fragility in the US: Evidence and Implications" *National Endowment for Financial Education*. Retrieved from https://www.nefe.org/research/research-projects/completed-research/2018/financial-fragility-in-the-us-evidence-and-implications.aspx

Nyhus, E. K., & Webley, P. (2001) "The role of personality in household saving and borrowing behavior" *European journal of personality*, *15*(S1), S85-S103.

Ortiz, H. (2018) "Pathways to Older Adults' Financial Well-Being: The role of financial Capability" *Innovation in Aging*, *2*(Suppl 1), 677.

Park, I., & Cho, S. (2019) "The influence of number line estimation precision and numeracy on risky financial decision making" *International Journal of Psychology*, *54*(4), 530-538.

Prakash, N., Alagarsamy, S., & Hawaldar, A. (2022) "Demographic characteristics influencing financial wellbeing: a multigroup analysis" *Managerial Finance*, *48*(9/10), 1334-1351.

Prawitz, A. D., Garman, E. T., Sorhaindo, B., O'Neill, B., Kim, J., & Drentea, P. (2006) "The incharge financial distress/financial well-being scale: Establishing validity and reliability" Fin Counsel Plan, 17, 34-50.

Ryu, S., & Fan, L. (2022) "The relationship between financial worries and psychological distress among US adults" *Journal of Family and Economic Issues*, 1-18.

Sabri, M. F., Wijekoon, R., Burhan, N. A. S., Rahim, H. A., Othman, M. A., & Magli, A. S. (2022) "The antecedents of financial health in Malaysia with the mediating effect of financial vulnerability" *Malaysian Journal of Consumer and Family Economics*, *28*, 100-129.

Salignac, F., Hamilton, M., Noone, J., Marjolin, A., & Muir, K. (2020) "Conceptualizing financial wellbeing: An ecological life-course approach" *Journal of Happiness Studies*, *21*(5), 1581-1602.

Santos, D. B., Mendes-Da-Silva, W., Flores, E., & Norvilitis, J. M. (2016) "Predictors of credit card use and perceived financial well-being in female college students: a Brazil-United States comparative study" *International Journal of Consumer Studies*, *40*(2), 133-142.

Saunders, M., Lewis, P., & Thornhill, A. (2016) "Research methods for business students (7th ed.)" *Nueva York:* Pearson Education.

SBP (2021) "Payment Systems Statistics" *State Bank of Pakistan*. Retrieved from https://www.sbp.org.pk/psd/pdf/PS-Review-Q1FY21.pdf

SBP (2019) "Financial Literacy & Capacity Building" *State Bank of Pakistan.* Retrieved from http://www.sbp.org.pk/Finc/FL.asp

SBP (2018) "National Financial Literacy Program Newsletter" *State Bank of Pakistan*. Retrieved from http://www.sbp.org.pk/sbp_bsc/BSC/DFSD/NFLP/2018/NFLP-Sep-Dec-2018.pdf

Shete, A., Dube, S., & Dubewar, A. (2020) "Sample size calculation in bio-statistics with special reference to unknown population" *Int. J. Innov. Res. Multidiscip. Field*, *6*, 236-238.

Tanoto, S., & Evelyn, E. (2019) "Financial knowledge, financial wellbeing, and online shopping addiction among young Indonesians" *Jurnal Manajemen dan Kewirausahaan*, *21*(1), 32-40.

Wicaksono, S., Subiyantoro, E., Zuhroh, D., Werdiningsih, S., & Sarasmitha, C. (2022) "The Effect of Personality Traits on Financial Behavior and the Use of e-Wallet as Intervening Variable" *in Proceedings of International Conference of Graduate School on Sustainability* (Vol. 7, No. 1).

Zhang, Q., & Kim, H. (2019) "American young adults' debt and psychological distress" *Journal of Family and Economic Issues*, *40*(1), 22-35.

Appendix A: Variables and their measurements

Section I: Background & Demographic Information

1. *Occupation: (a) doing business (b) doing job (c) doing nothing.* **Categorical**
2. *Experience: (a) Less than 3 years (b) 3 to 5 years (c) 5 to 10 years (d) more than 10 years.* **Categorical**
3. *Education: (a) PhD (b) MS / M.Phil. (c) MA/MSc/MBA (d) /BA/BSc/BS (e) Intermediate (f) Matriculation.* **Categorical**
4. *Gender: (a) male (b) female.* **Categorical**
5. *Age group: (a) 18–30 (b) 31–40 (c) 41–50 (d) 51 or above.* **Categorical**
6. *Marital status: (a) Married=married; (b) Single=single; (c) Divorced/sep=divorced or separated.* **Categorical**
7. *Children: number of children who are financial dependents.* **Continuous.**
8. *Monthly Income by group: (a) Up to Rs.25K (b) Rs.25–50K (c) Rs.50–100K (d) Rs.100K or above.* **Categorical**

Section II: Financial Literacy Variables

9. *Suppose you had $100 in a savings account, and the interest rate is 2% per year. After 5 years, how much do you think you would have in the account if you left the money to grow? (a) more than $102*; (b) exactly $102; (c) less than $102.* **(1 score for correct answer; otherwise, 0)**
10. *Imagine that the interest rate on your savings account was 1% per year and inflation was 2% per year. After 1 year, how much would you be able to buy with the money in the account? (a) more than today; (b) exactly the same; (c) less than today*.* **(1 score for correct answer; otherwise, 0)**
11. *If interest rates rise, what will typically happen to bond prices? (a) they will rise; (b) they will fall*; (c) they will remain the same; (d) there is no relationship between bond prices and the interest rate.* **(1 score for correct answer; otherwise, 0)**
12. *A 15-year mortgage typically requires higher monthly payments than a 30-year mortgage, but the total interest paid over the life of the loan will be less. (a) true*; (b) false.* **(1 score for correct answer; otherwise, 0)**
13. *Buying a single company's stock usually provides a safer return than a stock mutual fund. (a) true; (b) false*.* **(1 score for correct answer; otherwise, 0)**
14. Perceived Literacy = self-rating response to: *On a scale from 1 to 5, where 1 means very low and 5 means very high, how would you assess your overall financial knowledge?* **Continuous.**

* correct answers

Note: *Actual Literacy is calculated as the sum of correct responses to the first five financial literacy test questions.*

Section III: Credit Card Behaviour

15. *Not paid full = I do not always pay my credit cards in full.* **(1 for Yes; otherwise, 0)**
16. *Carry balance = In some months, I carried over a balance and was charged interest.* **(1 for Yes; otherwise, 0)**
17. *Min payment = In some months, I paid the minimum payment only.* **(1 for Yes; otherwise, 0)**
18. *Late fee = In some months, I was charged a late fee for a late payment.* **(1 for Yes; otherwise, 0)**
19. *Exceed credit = In some months, I was charged a fee for exceeding my credit limit.* **(1 for Yes; otherwise, 0)**

Section IV: Financial Wellbeing

20. *Because of my money situation, I feel like I will never have the things I want in life.*
21. *I am just getting by financially.*
22. *I am concerned that the money I have or will save won't last.*
23. *I have money left over at the end of the month. (Reverse coded).*
24. *My finances control my life.*

** Questions 20-24 are measured on a five-point scale (1 for completely agree to 5 for completely disagree) and are added to obtain the financial wellbeing score.

Section V: Personality Traits

25. *I see myself as someone who is reserved. (reverse coded for 30th)*
26. *I see myself as someone who is generally trusting.*
27. *I see myself as someone who tends to be lazy. (reverse coded for 32nd)*
28. *I see myself as someone who is relaxed and handles stress well. (reverse coded for 33rd)*
29. *I see myself as someone who has few artistic interests. (reverse coded for 34th)*
30. *I see myself as someone who is outgoing and sociable.*
31. *I see myself as someone who tends to find fault with others. (reverse coded for 26th)*
32. *I see myself as someone who does a thorough job.*
33. *I see myself as someone who gets nervous easily.*
34. *I see myself as someone who has an active imagination.*

** Question 25-34 are measured on a five-point scale (1 for strongly disagree to 5 for strongly agree) for assessing personality traits.

Appendix-B: *Discriminant Validity through Fornell-Larcker criterion*

	Actual_FL	Agreeableness	CC_Behaviour	Conscientiousness	Extraversion	Financial_WB	Neuroticism	Openness	Perceived_FL
Actual_FL	1								
Agreeableness	0.174	1							
CC_Behaviour	-0.142	-0.074	1						
Conscientiousness	0.039	0.244	-0.048	1					
Extraversion	-0.023	0.031	0.041	0.075	1				
Financial_WB	0.097	-0.020	-0.176	0.002	0.179	1			
Neuroticism	-0.085	-0.201	0.005	-0.124	-0.184	-0.181	1		
Openness	0.040	0.191	0.034	0.172	0.066	0.010	0.046	1	
Perceived_FL	0.054	-0.015	0.037	0.021	0.003	0.123	-0.200	-0.048	1

Appendix-C: *Discriminant Validity through Hetrotrait-monotrait ratio criterion*

	Actual_FL	Agreeableness	CC_Behaviour	Conscientiousness	Extraversion	Financial_WB	Neuroticism	Openness	Perceived_FL
Actual_FL									
Agreeableness	0.174								
CC_Behaviour	0.142	0.074							
Conscientiousness	0.039	0.244	0.048						
Extraversion	0.023	0.031	0.041	0.075					
Financial_WB	0.097	0.020	0.176	0.002	0.179				
Neuroticism	0.083	0.201	0.005	0.124	0.184	0.181			
Openness	0.040	0.191	0.034	0.172	0.066	0.010	0.046		
Perceived_FL	0.054	0.015	0.037	0.021	0.003	0.123	0.200	0.048	

Appendix-D: *Correlation Matrix*

	Actual-FL	Perceived-FL	PT-Extraversion	PT-Agreeable	PT-Conscientious	PT-Neuroticism	PT-openness	CC_Behaviour	Financial_WB
Actual-FL	1								
Perceived-FL	0.054	1							
PT-Extraversion	-0.023	0.003	1						
PT-Agreeable	0.174	-0.015	0.031	1					
PT-Conscientious	0.039	0.021	0.075	0.244	1				
PT-Neuroticism	-0.085	-0.200	-0.184	-0.201	-0.124	1			
PT-openness	0.040	-0.048	0.066	0.191	0.172	0.046	1		
CC_Behaviour	-0.142	0.037	0.041	-0.074	-0.048	0.005	0.034	1	
Financial_WB	0.097	0.123	0.179	-0.02	0.002	-0.181	0.010	-0.176	1