

DEVELOPMENT OF THE PERSONAL FINANCE KNOWLEDGE SCALE

Julio Cesar Vega\*

Nuria Patricia Rojas

Tecnologico de Monterrey

Av. Eugenio Garza Lagüera and Rufino Tamayo n/n

San Pedro Garza García, Nuevo León, C.P. 66260

Ph: (+52) 81-8625-6000

Corresponding author email: [A00738623@itesm.mx](mailto:A00738623@itesm.mx)

**Abstract**

Personal finances knowledge and money management practices are fundamental aspects of economic growth. There resides the importance of this paper that seek to develop a scale to measure personal finances application. It is usual to rely money management decisions in advices from colleagues, family and friends, is not that common to approach expert advisors. The authors develop a structural equation modeling to relate unobserved constructs to observed variables and validate the scale with a divergent and convergent analysis. The main purpose of this paper is to bridge the gap between financial literacy and personal finance application in a general population.

Keywords: personal finance, scale development, money management, financial literacy, SEM

### **Introduction**

Several financial problems can be found even in a micro-level. People do not know how to manage money, and when they do, they do not implement their knowledge. In a recent survey made by Instituto Belisario Dominguez, researchers found that Mexican people do not worry about what would happen the day of their retirement. They also found that 77 percent of the respondents do not have a savings or an investment account. Additionally, a recent survey conducted by El Financiero Bloomberg Mexico, revealed that the majority of the millennial population have the habit of saving but do not invest it for future growth. The survey found that even though millennials do not waste their total income, only 12 and 1 percent invest it or contribute to their pension funds, respectively.

Previous research has looked into different aspects of managing personal finances and money. Stango and Zinman (2009) stipulated that people choose to consume, borrow, or save based on their preferences, their expectations, and the cost and benefits of borrowing and saving. Furthermore, we can find different scales to measure the competences of people toward their finance behavior (Yamauchi & Templer, 1982; Spinella, Yang & Lester, 2007). However, the objective of this paper is to introduce a new approach to this discussion of personal finance behavior underexplored: financial education. We aim to assess if the origins of bad financial practices are in the lack of knowledge of how to manage money. Therefore, we seek to develop a scale that integrates the level of personal financial knowledge and its application to manage their money.

Another line of research denominated as financial literacy, developed in 1992 by Noctor, et al. (Marcolin & Abraham, 2006) has evolved from the ability to use and manage money (Noctor, et al., 1992) to the understanding, managing and planning personal finances (Amagir et al. 2018). This research area encompasses the knowledge and skills applied in

areas such as home ownership, investments, debt and risks management and so on (Cull. & Whitton, 2011).

Personal finances reflect the development of an economy. Therefore, it is important to realize the impact that good management of financial resources can make a difference in people's lives overall. Remembering the 2008 crisis, it was personal mortgages defaults which originated the biggest financial crisis since the Great Depression (Mian and Sufi, 2009).

Building on this, the present study thus attempts to develop the personal finance knowledge scale with the objective to explore the financial knowledge applicable to a more general population than previous financial literacy scales used in early studies (Atikson & Messy, 2011) and other related personal finance scales (Spinella, Yang & Lester, 2007). The implementation of this scale is made in the Mexican population from 24 to 38 years old with a recurrent income. Nevertheless, the present measurement instrument can be applied in other regions and ages.

The structure of the article is as follows. The first section reviews the literature on the measurement of personal finance, scales developed on the basis of managing money. The second section introduces the key dimensions of personal finance planning based on theoretical approaches of the topic to establish the foundations for the present scale. The third section describes the data and methods, we detail our findings on the development of the scale. The final section provides the conclusion and future research directions.

### **Literature review of scales related to personal finance**

To identify the state of research in the measurement of personal finances, a literature review was conducted as a multi-stage process. As a first step, personal finances were determined as the relevant research area. We consider that managing personal money can be

influenced by different facts. Therefore, in the next step, the goal was to provide an overview of the relevant and current research literature focused on measures of personal attitudes towards money.

For this search, we used the database of academic literature EBSCOhost. We selected academic articles that fit the specific keywords: “personal finance scale”, “personal attitudes towards money”, “attitudes toward managing money” and “personal money management scale”. In this search, these keywords have been considered for the complete research articles, i.e. title, abstract and text. These keywords fulfill the task to keep the focus of this review on relevant scales concerning the measurement of attitudes toward managing money.

Out of the papers identified based on these keywords, in a second step, we look through the complete articles searching for the scales mentioned or based their research on. This methodology yielded five scales in total. As a third step, we searched for the articles that developed the scales founded to assess their objectives and content. A brief description of the scales, the authors, and item examples are shown in Table 1.

Table 1. Scales measuring attitudes towards money

Scale	Authors	Description	Item Example
Money Attitudes Scale	Yamauchi & Templer, 1982	The scale provides a reliable assessment of five factors of money attitudes.	I do financial planning for the future.
Compulsive Buying Scale	Fabe & O'Guinn, 1992	Unidimensional scale to identify compulsive buyers.	If I have any money left at the end of the pay period, I just have to spend it.
Material Values Scale	Richins & Dawson, 1992	Materialism scale with three components.	The things I own say a lot about how well I'm doing in life.
Executive Personal Finance Scale	Spinella, Yang & Lester, 2007	Self-rating of executive aspects of personal money management.	When I see something I want, I have a hard time not buying it.

Perceptions of payment mode scale	Khan, Belk & Craig-Lees, 2015	Captures consumers perceptions in 19-item four dimensions.	If I had a 100 note in my wallet... I would feel confident.
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The Money Attitudes Scale (Yamauchi & Templer, 1982) provides a reliable assessment of five factors of money attitudes: Power-prestige, Retention-time, Distrust, Quality, and Anxiety. The response format of the scale is a 7-point Likert scale, constituted by 29 items. This scale can be utilized to identify irrational and problematic attitudes and behaviors with money. Further research has applied this scale to measure compulsive buying in young Mexican adults (Roberts & Sepulveda, 1999). Other authors have tested the consistency of undergraduates and community residents (Yang & Lester, 2002; Spinella, Lester & Yang, 2005).

The Compulsive Buying Scale (Fabe & O'Guinn, 1992) is a unidimensional scale composed by seven items to identify compulsive buyers by represented behaviors, motivations, and feelings associated with buying significantly. It is stated that compulsive buying becomes very difficult to stop and ultimately results in harmful economic, psychological and societal consequences. This scale has been applied to analyze the severity concept of compulsive buying in a sample of 44 subjects considered compulsive buyers. Results have come to the conclusion that compulsive buyers with lower incomes had greater illness severity and were less likely to have incomes above the median (Black, Monahan, Schlosser & Repertinger, 2001). An additional study has compared the scale with another two compulsive buying scales in an Italian sample, concluding that this scale has a better validity measuring compulsive buying in survey research. (Tommasi & Busonera, 2012).

Material Values Scale (Richins & Dawson, 1992) is a scale to measure materialism among individuals with three components. Acquisition centrality, when people places

possessions and their acquisition at the center of their lives; acquisition as the pursuit of happiness, when the pursuit of happiness is through acquisition rather than through other means; and possession-defined success, when people judge their own and others success based on the number and quality possessions accumulated.

We have found that Richins (2002) developed a short form of the Material Values Scale (MAS), with 15 items that improve the dimension properties. This scale has been tested in a cross-cultural study measuring consumers among Eastern and Western Europe, concluding that a new instrument is needed to measure equivalent materialism in a cross-cultural context (Griffin, Babin, Christensen, 2004). Moreover, adaptations of this scale have been performed to be applied in children developing the scale MVS-c (Oprea SJ., et al, 2011).

Executive Personal Finance Scale (Spinella, Yang & Lester, 2007) is a self-rating of executive aspects of personal money management. Twenty items are grouped into 4 factors: impulse control, organization, planning, motivational drive. The scale showed to have correlations with compulsive buying and money attitudes. The study is based on ample evidence that executive functions, and the prefrontal systems of the brain that mediate them, play a role in managing personal finances. This allows the behavior of goal-oriented, flexible, and autonomous. Authors analyze demographic influences, one variable was education, and it had no apparent impact on the total score, it is important to declare education as years of general education, not financial education. Items were created to reflect different domains of finances, organization, financial planning, and impulse control over spending.

Additional publications about the previous scale performed an analysis using 138 college students, concluding that the planning subscale appeared to consist of two distinct components, investment, and saving behavior (Lester, Spinella, 2007). Recently, a validity

study of the scale was performed in 93 undergraduate students obtaining results that support the Executive Personal Finance Scale (Yang & Lester, 2016).

The Perceptions of payment mode scale (PPM) (Khan, Belk, & Craig-Lees, 2015) captures the cognitive and emotional associations with payment modes. Composed of 19 items, this scale represents four dimensions: emotions relating to cash payment, emotions related to card-based payment, social and personal gratification and money management. According to the authors, the scale can aid researchers to know how cognitive and emotional associations affect spending behavior. Thus far, we have not found any adaptations to this scale in the literature or applications in different contexts, the scale is relatively new and has six citations according to ScienceDirect.

Based on these previous developments, we aim to create a scale that integrates financial knowledge into the discussion of personal financial behavior. The scale will examine the existing scales to analyze if there items that can be extracted to their implementation in the personal finance knowledge scale. Additionally, it will integrate new items to measure personal finances knowledge based on theoretical approaches to personal finance and advice from experts in the field.

### **Theoretical Background of Personal Finance**

Altfest, L. (2007) defines personal finance as the study of how people develop the necessary cash flow to support their operations and provide for their well-being. In this topic, they define personal financial planning as the analysis and decision-making; an extension of personal finance composed of four broad categories; consumption and savings, investments, financing, and risk management. Additionally, Kapoor et al. (2009) establish the components of financial planning as retirement, investing, managing risk, spending, borrowing, saving, planning and obtaining.



Keown et al. (2003) highlight that ignoring personal financial planning can have painful results in the life of people regardless of how much they make, therefore they propose several things; on which we find remarkable to accumulate wealth for special expenses, save for retirement, cover your assets, invest intelligently, and minimize your tax payments.

Following the commonalities of this authors and with advice from experts in the personal finance field, we establish the following dimensions for the construction of the personal finance knowledge scale. The following definitions are proposed from the literature and have been used in some money management scales.

**Expenditures.** In this dimension Keown et al. (2003), explain that is important for every individual to have a financial plan. Kapoor et al. (2009) establish the importance of detailing your living expenses and other financial obligations in a spending plan.

**Credit Card.** For Keown et al. (2003) the most dangerous debt is right in your pocket, your credit card. When people use them most of the times, they do not think through, as they do not need to exchange cash. Also, they may become addicted to spend with this resource. However, the authors point the benefits of owning a credit card if used smartly; they facilitate online purchases, they assist in tracking spending for budgeting purposes, and some of them provide insurances in travels and personal accidents.

**Investment.** Investment has been a dimension when evaluating personal finance knowledge in several studies related to money management (Chen et al. 2002). Nissenbaum et al. (2004) proposed investment planning as a strategy to build wealth through the understanding of investment vehicles and financial markets. Kapoor et al. (2009) recognize that there are many types of investment vehicles available and people should select them according to their financial needs.

Savings. The savings dimension has been included in related personal-finance scales (Chen et al. 2002). Kapoor et al. (2009) signaled that previous research indicates that people with a financial plan had significantly higher amounts in savings than those who did not have a plan.

Retirement. Lusardi et al. (2011). Conducted a research focused on retirement plans, they assure that people fail to plan for retirement and conclude that people with good financial practices are more likely to plan and to succeed in their planning, they rely on formal methods such as retirement calculators, retirement seminars, and financial experts, instead of family, relatives, and co-workers.

Insurance. Adequate insurance coverage is an important component of personal financial planning Kapoor et al. (2009). Nissenbaum et al. (2004) stated that a way to protect your family and assets fundamental in financial planning is through insurances, they proposed life, health, property/causality, disability, and auto insurance.

### **Model development**

As previously mentioned, we establish that personal finance practices in general population can be measured by obtaining information about money practices in six areas. The initial areas proposed for the construction of this scale were expenditures, savings, insurance, credit cards, retirement and investments. Proxy statements were used to code these variables using a Likert scale response for each statement. A total of 69 items were developed for revision submission with experts. After the experts recommendations a total of 29 items were considered to collect information in a pre-test exercise.

Sample for the data collection were obtained from general population over 18 years old with no specific characteristics. Principal sampling sources were author's personal network. Secondary sources includes firefighters station, graduate schools, parks and coffee

shops. For the pretest analysis a sample of 72 participants were used, feedback from participants included changes in the composition of statements, rearrangement of the options in the answer section and the introduction statement to questionnaire.

Final distribution of questionnaire included a total sample of 172 respondents, from which 16 were deleted because either were under 18 years old or didn't answered all sections of the questionnaire. The principal channel of distribution were online, only the application for the pretest sample were done in person. Because the sensitive of the information provided the authors were prohibited from identifying the respondents by name or generating a mailing list.

We execute a factor analysis to determine how many factors were necessary to group the 29 items. In our first analysis, nine factors were obtained reaching a Cronbach's alpha of 0.76 and an explained variance of 51.37%, factor loads are shown in Appendix 1. After this analysis, we obligated the execution of 6 factors with the complete number of items. The results from the second factor analysis is shown in appendix 2.

We observed items developed for a specific dimension grouped in other dimensions, the six factors grouped items not related to a specific domain in the literature. Our first goal was to arrange the factors that group the items in a manner that make sense according to our six dimensions. We executed a reliability analysis and examine items that if deleted from the model increase the Cronbach's alpha, also those that showed a factor load less than 0.60 and those that were grouped in a wrong dimension. The items that did not accomplished the required criteria were deleted (i.e., Q15RC, Q4RC, Q24RC, Q6RC, Q9RC, Q11RC).

As we can notice, all deleted items were reverse code. After this process, we executed the factor analysis to determine how many factors were necessary to group the 23 items left.

The analysis resulted in seven factors reaching a Cronbach's alpha of 0.829 and an explained variance of 63.94%, reaching a better model, the factor loads are shown in Appendix 3.

Results show that item Q27 is grouped alone in factor number seven. The rest of the factors, from one to six, grouped all of the items according the dimension they belong to. Then, we executed the model with the restriction of six dimensions, the grouping of items did not make sense again. The reliability analysis showed that if item Q27 were deleted from the model, the Cronbach's alpha would increase from 0.829 to 0.833. Based on these results we decided to remove item Q27 to reach our first goal. We run a factor analysis with the 22 items left, reaching a 61.11% of explained variance. The factor loads are shown in Appendix 4.

Our second goal is to improve the model by eliminating items with low load to improve the model (i.e., Q18 and Q28). Then we executed factor and reliability analysis to obtain the loads and Cronbach's alpha for our improved model with 20 items that explain the 62.36% of the variance. Loads for this final model are shown in Table 2.

*Table 2. Factor Analysis. 20 items. 6 Factors*

Item	Factor Number					
	1	2	3	4	5	6
Q3	0.800	0.138	0.087	0.200	-0.113	0.022
Q1	0.798	0.098	0.010	0.159	0.128	0.126
Q5	0.730	-0.180	-0.014	0.221	0.145	-0.051
Q17	0.457	0.357	0.271	-0.145	0.146	0.305
RC Q19	0.024	0.736	0.095	0.072	-0.115	-0.102
RC Q20	0.062	0.708	-0.213	0.168	0.024	0.120
RC Q21	-0.094	0.652	-0.385	0.177	0.162	0.023
Q16	0.220	0.582	0.220	0.043	0.092	0.408
Q2	0.391	0.392	0.012	0.042	0.323	-0.045
Q23	-0.032	-0.097	0.761	0.141	0.129	0.120
Q22	-0.081	0.086	0.753	0.279	0.113	-0.061
Q25	0.250	-0.082	0.727	0.036	0.100	0.099
Q7	0.084	0.019	0.326	0.716	0.021	0.150

Q8	0.231	0.217	0.087	0.698	0.097	0.068
Q10	0.256	0.181	0.057	0.627	0.124	0.079
Q13	0.110	0.153	0.117	-0.098	0.776	0.157
Q12	0.069	0.006	0.107	0.443	0.684	0.057
Q14	0.058	-0.235	0.365	0.315	0.536	-0.048
Q26	-0.092	0.187	-0.047	0.092	0.011	0.800
Q29	0.200	-0.153	0.172	0.173	0.137	0.730

When we assessed the best model available from the information obtained, the developed model was introduced into AMOS, to run a structural equation model analysis. Items were renamed for simplicity. The introduced model is shown in Figure 1, relations between constructs and the observable variables can be identified.

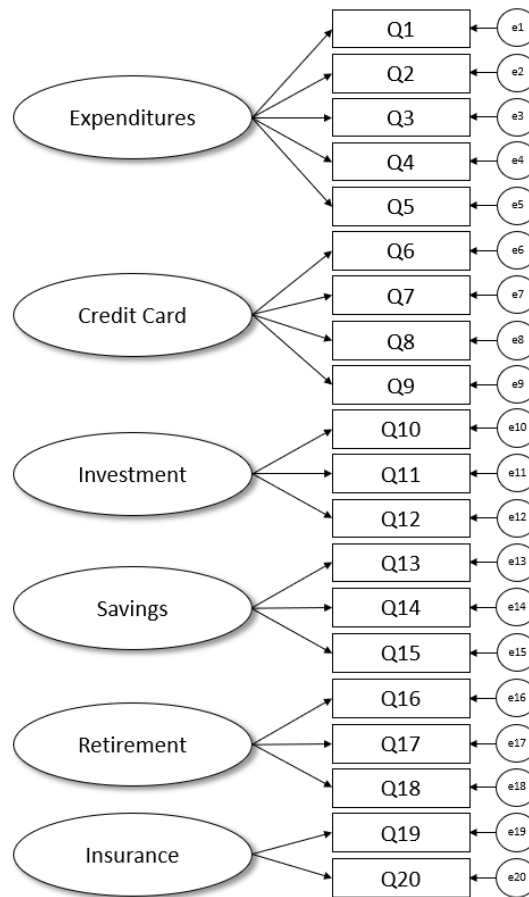


Figure 1. Structural Model 1

To validate our model, we estimate the Goodness of Fit Index (GFI) by running the default model in AMOS. The GFI obtained is of 0.848, a desirable value for GFI is of 0.90 (Revuelta, J., & Kessel, D., 2007), meaning that our model can be improved. Other valuation parameters that we use to determine if our model is well adjusted to measure the constructs are the RMSEA, the obtained value was 0.071, a desirable value is 0.05 (Steiger & Lind, 1980). We calculate the Comparative Fit Index (CFI) to obtain a value of 0.835, a desirable value is 0.90 or more (Bentler, P. M., 1990), this brings us to the same conclusion, our model can be improved.

We execute a convergent analysis to determine that the observed variables are measuring the determined constructs (Fornell & Larcker, 1981). The estimations of the structural equation model for each relation between variable and construct are shown in Appendix 5.

As we can see the variable Q20 has a low estimate of 0.484; the construct “Investment” is only measured by Q20 and Q19, if we delete Q20 the construct will be measured directly from Q19 and no estimation can be done. Then, we calculate the Average Extraction (AVE) for each construct, a desirable value is more than 0.5, results are shown in Appendix 6.

As we can see, no value is more than 0.5; the construct “Insurance” has the lowest value with 0.371. Then we proceed to calculate the, results are shown in Appendix 7.

The desirable value for Composite Reliability is 0.70 or more. In our model the constructs “Credit Cards” “Savings” and “Insurance” have a lower Composite Reliability than 0.70. The value that brings our attention is “Insurance” with 0.53. Based on this, we decide to eliminate the construct of “Insurance” and leave 5 dimensions measured by 18 variables. The final model is shown in Figure 2.

Figure 2. Improved Structural Model

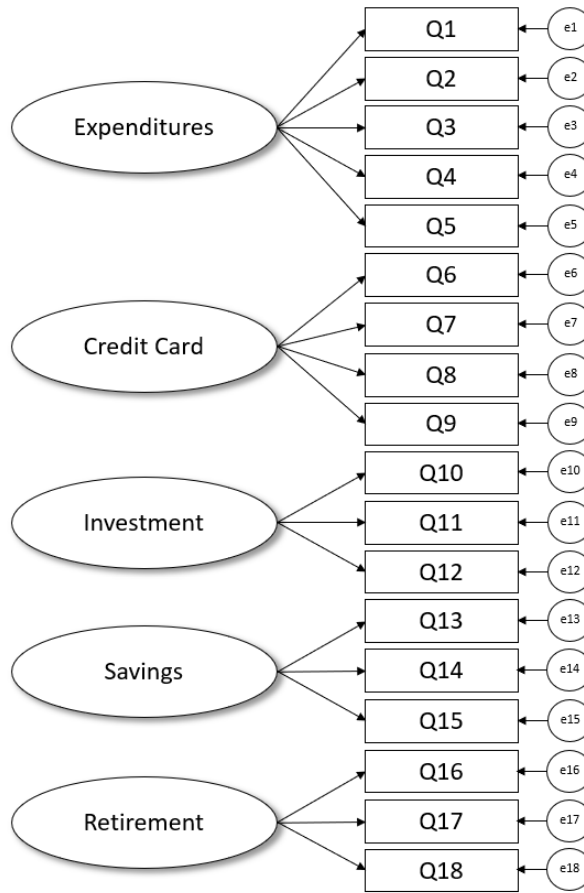


Figure 2. Final Structural Model

To validate our new model, we estimate the Goodness of Fit Index (GFI). The GFI obtained improved to 0.866, closer to 0.9. The value for RMSEA also improved to 0.069, closer to 0.05. We calculate the Comparative Fit Index (CFI) to obtain an improved value of 0.866, closer to 0.90, this bring us to the same conclusion; our model was improved by excluding the insurance dimension.

We execute a convergent analysis for our new model to determine that the observed variables are measuring our constructs. The estimations of the structural equation model for each relation between variable and construct are shown in Table 3.

Table 3. Convergent Analysis

Observed Variable		Unobserved Construct	Estimate
Q1	<---	E	0.817
Q2	<---	E	0.403
Q3	<---	E	0.767
Q4	<---	E	0.609
Q5	<---	E	0.422
Q6	<---	CC	0.49
Q7	<---	CC	0.542
Q8	<---	CC	0.731
Q9	<---	CC	0.6
Q10	<---	I	0.661
Q11	<---	I	0.754
Q12	<---	I	0.655
Q13	<---	S	0.623
Q14	<---	S	0.718
Q15	<---	S	0.63
Q16	<---	R	0.749
Q17	<---	R	0.465
Q18	<---	R	0.592

As we can see, the variables Q2, Q5, Q6, Q7, Q9, Q10, Q12, Q13, Q15, Q17 and Q18 have a low estimate; less than 0.7. Then we calculate the Average Extraction (AVE) for each construct, a desirable value is more than 0.5, results are shown in Table 4.

Table 4. AVE

Unobserved Construct	AVE
E	0.3934
CC	0.3571
INV	0.4782
S	0.4335
R	0.3759



As we can see, all values are less than 0.5. We then calculate the Composite Reliability, results are shown in Table 5.

*Table 5. Composite Reliability*

Unobserved Construct	Composite Reliability
E	0.7502
CC	0.6846
INV	0.7324
S	0.6956
R	0.6353

The desirable value for Composite Reliability is 0.70 or more. In our model, the constructs “Credit Cards” “Savings” and “Retirement” have values of Composite Reliability close to 0.7; concluding that for all the model the observed variables are measuring the unobserved construct.

We develop a divergent analysis (Anderson & Gerbin, 1988) to prove that the constructs are different from each other. First, we calculate the Chi-square for the default model and for every subsequent model placing a constraint of total correlation between two constructs. Results are shown in Table 6.

*Table 6. Chi-square*

Correlation	Chi square	P-Value
Default Model	217.12	
E & CC	289.99	3.8501E-49
E & I	304.00	5.0073E-65
E & S	262.30	4.4314E-68
E & R	262.20	5.4098E-59
CC & I	301.40	5.6882E-59
CC & S	268.70	1.6322E-67
CC & R	270.30	2.1789E-60
I & S	266.10	9.7617E-61
I & R	241.40	8.0338E-60

S & R	238.30	1.9474E-54
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The results show that all hypothesis of correlation equal to one are rejected; concluding that the constructs are different from each other. An additional analysis is carried out according to Fornell & Larker (1981) to prove that given any pair of constructs, one explains more variance with the items that constitute it, than the other construct. To compute the analysis, we need the correlations of each pair of constructs, shown in Table 7.

Table 7. Construct correlations

Construct 1		Construct 2	Correlations
E	<-->	CC	0.297
E	<-->	I	0.221
E	<-->	S	0.538
E	<-->	R	0.369
CC	<-->	I	-0.162
CC	<-->	S	0.411
CC	<-->	R	0.096
I	<-->	S	0.446
I	<-->	R	0.568
S	<-->	R	0.632

We based the analysis in the following criteria to validate divergence:

$$Min\{AVE_1, AVE_2\} > [Corr(\eta_1, \eta_2)]^2$$

It can be observed in Table 8, that for any pair of construct, the correlation of the constructs present a lower value than the minimum AVE of each construct, except for the pair of savings and retirement, where the square of correlation is higher than the minimum AVE of both constructs. This can be explained analyzing the nature of the constructs, where one person need to save money for retirement, nevertheless, the minimum AVE has a value close to the correlation.

Table 8 Divergence validation

Construct 1	Construct 2	(Corr) <sup>2</sup>	Min AVE
E	CC	0.09	0.36
E	I	0.05	0.39
E	S	0.29	0.39
E	R	0.14	0.38
CC	I	0.03	0.36
CC	S	0.17	0.36
CC	R	0.01	0.36
I	S	0.20	0.43
I	R	0.32	0.38
S	R	0.40	0.38

The final scale can be found in Table 9

Table 9 Personal Finance Scale

	Completamente de Acuerdo				Completamente en desacuerdo
	1	2	3	4	
1. Realizo cuidadosamente un presupuesto o plan de gastos					
2. Asisto al supermercado con una lista de lo que voy a comprar					
3. Evalúo e identifico mis hábitos de gasto con base en mis registros de consumo					
4. Llevo un registro de mis ingresos, gastos, retiros de efectivo, etc. adicional a lo que proporciona mi banca en línea o estado de cuenta.					
5. Antes de recibir el estado de cuenta de mi tarjeta de crédito, sé exactamente cuánto debo pagar para no generar intereses.					
6. Cuando realizo compras a meses sin intereses, analizo que mi compra esté dentro de mi presupuesto.					
7. Acostumbro a retirar efectivo de mi tarjeta de crédito.					
8. Acepto las tarjetas de crédito que me ofrecen bancos y tiendas.					
9. Acostumbro a pagar gastos de comida o despensa a meses sin intereses.					
10. Invierto en instrumentos financieros (p. ej. acciones, fondos de inversión, etc.).					
11. Dedico tiempo a informarme sobre los mejores rendimientos para decidir en cuáles instrumentos colocar mi dinero.					
12. Reviso y ajusto mis inversiones en un periodo no mayor a un año.					
13. Tengo disponible al menos 6 meses de mi sueldo en ahorros para utilizar ante una emergencia (p. ej. pérdida de empleo).					
14. El ahorro es un renglón de mi presupuesto, siempre ahorro un porcentaje de mi ingreso.					
15. Aparto dinero para mis metas (p. ej. vacaciones, automóvil, educación)					
16. Tengo un plan de aportaciones para mi pensión.					
17. Sé en donde está mi AFORE y estoy consciente de los rendimientos que me brinda					
18. Realizo periódicamente aportaciones adicionales a mi plan de retiro					

### **Discussion**

The final goal of this paper is to develop an scale to screen for the problem of bad practices in personal finances. A structural equation model was proposed to specify weightings for eighteen variables that significantly contributed to value the five principal dimensions on personal finances allowing to distinguish those persons that take wrong decisions in money management. These dimensions includes practices in expenses, savings, retirement, credit cards and investments.

This research was focus on personal finances practices on general population, distinct as past studies in personal finances where the primary focus are specific population with unique characteristics (i.e. executives, students). The study intension is to help other researchers in assessing in a reliability manner the level of good practices in personal finances that a specific population present, and relate this findings to other characteristics.

### **Conclusion**

The study present limitations that need to be acknowledged. While the results are encouraging, unfortunately, no assessment of stability was feasible in the study because of the single contact required by the confidentiality restriction. Another factor that need to be exposed is the resources limitation for obtaining the sample. The authors tried to collect the most variability in the characteristics of the individuals included in the sample, nevertheless the time limitation caused that the most part of the sample were from author's personal networks.

### **Future Research**

In the study the developed scale was validated by a convergent and divergent analysis. We encourage for future research to validate the scale by applying it into two groups of samples. First sample including individuals that had demonstrated good personal finance practices,

and second sample including individuals that had demonstrated bad personal finance practices. The study can utilize a proxy like credit score to evaluate individuals. The validation expectation would be that the screened groups resembled the results in the scale. The Personal Finance Scale developed in this study consists of eighteen items, which brings the possibility to adapt a new study to develop a small version of the scale.

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## Appendix

Item	Factor Number								
	1	2	3	4	5	6	7	8	9
Q23	0.679	0.008	-0.038	0.054	0.180	-0.259	0.099	0.098	0.195
Q22	0.675	0.100	-0.049	0.125	0.048	-0.094	0.061	0.238	0.295
RC Q9	-0.672	-0.101	-0.104	-0.076	0.017	-0.178	0.074	0.146	0.315
Q14	0.658	-0.117	0.098	0.220	0.023	0.092	0.239	-0.062	-0.180
Q25	0.636	0.130	0.156	0.060	0.079	-0.366	-0.019	0.051	0.022
Q16	0.064	0.758	0.078	0.092	0.207	-0.109	0.083	0.141	-0.064
Q18	0.099	0.665	0.121	0.059	0.332	-0.180	0.063	0.083	-0.142
Q17	0.197	0.569	0.323	-0.021	0.109	-0.116	0.132	-0.176	0.067
RC Q20	-0.348	0.525	0.010	0.356	-0.061	0.038	0.202	0.030	0.339
RC Q19	-0.083	0.507	-0.018	0.101	-0.106	0.324	0.003	0.361	0.275
RC Q21	-0.274	0.496	-0.143	0.309	-0.050	0.485	0.060	-0.044	-0.046
Q2	0.146	0.491	0.310	0.109	-0.114	0.222	0.009	0.046	-0.262
Q3	0.006	0.190	0.778	0.180	0.044	-0.019	-0.095	0.125	0.084
Q5	0.126	-0.044	0.776	0.104	0.025	0.045	0.085	-0.033	-0.106
Q1	-0.027	0.242	0.740	0.239	0.085	-0.216	0.152	-0.120	0.046
Q10	0.117	0.190	0.190	0.725	0.030	-0.139	0.059	0.037	-0.102
Q8	0.157	0.159	0.264	0.635	0.078	0.112	0.028	0.141	0.022
Q7	0.333	-0.023	0.179	0.475	0.301	0.069	-0.001	0.422	0.059
Q29	0.221	0.076	0.233	-0.011	0.769	0.025	0.098	0.072	-0.109
Q26	-0.112	0.319	-0.148	0.107	0.707	-0.010	0.093	-0.132	0.109
Q28	0.345	-0.020	0.060	0.405	0.519	-0.115	-0.195	0.155	-0.117
Q27	0.075	0.084	0.052	0.024	-0.004	-0.736	-0.019	-0.012	0.032
RC Q15	-0.055	-0.183	0.116	-0.077	0.047	0.413	-0.412	-0.271	0.192
Q13	0.112	0.124	0.117	0.013	0.120	-0.050	0.790	0.087	-0.134
Q12	0.336	-0.028	0.114	0.492	0.094	0.080	0.540	-0.055	-0.026
RC 24	-0.118	0.188	-0.012	-0.032	-0.082	0.363	0.457	-0.022	0.300
RC Q4	0.028	-0.044	0.123	-0.227	-0.005	0.159	-0.032	-0.728	0.055
RC Q6	0.229	0.165	0.331	-0.223	0.010	0.234	0.161	0.537	0.000
RC Q11	0.074	-0.088	0.018	-0.068	-0.045	0.019	-0.123	-0.047	0.836

*Appendix 1. Factor Analysis, 29 items, 9 factors.*

Item	Factor Number					
	1	2	3	4	5	6
Q1	0.790	0.251	0.097	0.015	0.033	0.035
Q3	0.783	0.026	0.214	0.087	-0.054	0.078
Q5	0.732	-0.089	0.085	-0.092	0.242	-0.004
Q2	0.393	0.184	0.103	0.261	0.278	-0.150
Q18	0.222	0.703	0.193	0.109	0.054	0.024
Q16	0.203	0.675	0.173	0.296	0.029	0.040
Q26	-0.094	0.550	0.296	0.037	-0.142	-0.120
Q17	0.450	0.468	-0.042	0.141	0.104	0.142
RC Q15	0.128	-0.456	0.046	-0.042	-0.236	-0.170
Q29	0.162	0.385	0.372	-0.223	0.193	0.035
Q27	0.099	0.380	-0.062	-0.337	-0.182	0.344
Q28	0.044	0.188	0.697	-0.285	0.105	0.135
Q7	0.120	0.012	0.690	0.086	0.200	0.259
Q8	0.310	0.027	0.588	0.229	0.168	0.019
Q10	0.276	0.182	0.557	0.090	0.159	-0.023
RC Q4	0.211	-0.132	-0.357	-0.198	0.022	-0.200
RC Q19	0.045	0.098	0.151	0.693	-0.117	0.071
RC Q20	0.146	0.308	0.110	0.635	-0.245	-0.073
RC Q21	-0.018	0.128	0.183	0.606	0.010	-0.454
RC 24	0.003	0.003	-0.193	0.579	0.141	-0.019
RC Q6	0.223	0.015	0.023	0.299	0.276	0.254
Q14	0.080	-0.073	0.234	-0.137	0.663	0.232
Q12	0.114	0.085	0.308	0.154	0.579	0.100
Q13	0.060	0.387	-0.135	0.201	0.563	0.062
RC Q9	-0.149	0.041	-0.195	0.185	-0.559	-0.103
Q22	-0.037	0.054	0.284	0.083	0.256	0.677
Q23	-0.038	0.157	0.218	-0.166	0.278	0.648
Q25	0.191	0.228	0.181	-0.256	0.251	0.549
RC Q11	0.047	-0.282	-0.051	0.235	-0.416	0.524

*Appendix 2. Factor Analysis. 29 items. 6 Factors*

Item	Factor Number						
	1	2	3	4	5	6	7
Q16	0.730	0.150	0.153	0.058	0.259	0.077	0.045
RC							
Q20	0.683	-0.301	-0.026	0.304	-0.123	0.041	0.035
Q18	0.608	0.164	0.176	0.070	0.382	0.037	0.192
RC							
Q19	0.594	0.082	0.032	0.091	-0.134	-0.153	-0.500
Q17	0.513	0.181	0.383	-0.088	0.134	0.156	0.158
RC							
Q21	0.511	-0.389	-0.096	0.222	0.000	0.111	-0.382
Q22	0.131	0.782	-0.056	0.186	-0.045	0.120	-0.068
Q23	-0.006	0.757	-0.032	0.102	0.124	0.138	0.091
Q25	0.031	0.689	0.215	0.078	0.105	0.072	0.218
Q3	0.154	0.086	0.810	0.175	0.028	-0.116	-0.095
Q5	-0.117	0.033	0.770	0.126	0.022	0.158	-0.007
Q1	0.215	-0.015	0.763	0.179	0.085	0.114	0.197
Q2	0.342	0.006	0.390	0.091	0.027	0.215	-0.197
Q10	0.190	0.030	0.197	0.731	0.038	0.111	0.205
Q8	0.195	0.096	0.236	0.665	0.016	0.152	-0.110
Q7	0.015	0.374	0.114	0.635	0.207	0.050	-0.122
Q29	-0.007	0.167	0.207	0.102	0.781	0.146	-0.005
Q26	0.328	-0.082	-0.115	0.035	0.707	0.041	-0.001
Q28	-0.095	0.345	0.065	0.504	0.517	-0.069	0.046
Q13	0.228	0.089	0.093	-0.083	0.090	0.771	0.020
Q12	0.031	0.131	0.082	0.411	0.056	0.707	-0.005
Q14	-0.208	0.430	0.116	0.207	0.050	0.538	-0.040
Q27	0.101	0.161	0.000	0.058	-0.015	-0.033	0.848

*Appendix 3. Factor analysis. 23 items. 7 Factors*

Item	Factor Number					
	1	2	3	4	5	6
Q1	0.799	0.090	0.008	0.140	0.159	0.116
Q3	0.798	0.124	0.075	0.201	0.016	-0.108
Q5	0.744	-0.153	-0.001	0.169	-0.047	0.158
Q17	0.453	0.318	0.268	-0.170	0.340	0.141
Q2	0.382	0.346	-0.010	0.099	0.060	0.239
RC Q19	0.029	0.724	0.096	0.065	-0.059	-0.127
RC Q20	0.076	0.714	-0.210	0.107	0.106	0.052
RC Q21	-0.087	0.650	-0.391	0.163	0.060	0.138
Q16	0.223	0.568	0.222	-0.011	0.477	0.084
Q22	-0.065	0.117	0.762	0.235	-0.045	0.148
Q23	-0.038	-0.110	0.742	0.169	0.117	0.148
Q25	0.231	-0.126	0.701	0.112	0.141	0.073
Q7	0.094	0.062	0.313	0.696	0.109	0.076
Q10	0.260	0.204	0.041	0.635	0.087	0.131
Q28	0.040	-0.173	0.281	0.618	0.406	-0.057
Q8	0.258	0.279	0.084	0.615	0.009	0.170
Q26	-0.112	0.151	-0.091	0.105	0.748	0.040
Q29	0.167	-0.210	0.113	0.256	0.700	0.135
Q18	0.245	0.388	0.227	0.025	0.578	0.039
Q13	0.119	0.129	0.111	-0.125	0.184	0.764
Q12	0.094	0.046	0.105	0.382	0.042	0.718
Q14	0.074	-0.209	0.358	0.290	-0.059	0.557

*Appendix 4. Factor Analysis. 22 items. 6 dimensions.*

Observed Variable		Unobserved Construct	Estimate
Q1	<---	E	0.819
Q2	<---	E	0.403
Q3	<---	E	0.766
Q4	<---	E	0.607
Q5	<---	E	0.424
Q6	<---	CC	0.519
Q7	<---	CC	0.53
Q8	<---	CC	0.714
Q9	<---	CC	0.604
Q10	<---	INV	0.656
Q11	<---	INV	0.76
Q12	<---	INV	0.655
Q13	<---	S	0.623
Q14	<---	S	0.718
Q15	<---	S	0.63
Q16	<---	R	0.752
Q17	<---	R	0.467
Q18	<---	R	0.588
Q19	<---	INS	0.713
Q20	<---	INS	0.484

*Appendix 5. Structural equation model results 1*

Unobserved Construct	AVE
E	0.3936302
CC	0.35621825
INV	0.478987
S	0.43351767
R	0.37644567
INS	0.3713125

*Appendix 6. AVE 1*

Unobserved Construct	Composite Reliability
E	0.75038724
CC	0.68510822
INV	0.73290881
S	0.69567347
R	0.63576810
INS	0.53260632

*Appendix 7. Composite Reliability 1*