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## FINANCIAL LITERACY AS A PREREQUISITE FOR CITIZENS' ECONOMIC SECURITY: DEVELOPMENT OF A MEASUREMENT INSTRUMENT

Guna Ciemleja<sup>1</sup>, Natalja Lace<sup>2</sup>, Jelena Titko<sup>3</sup>

<sup>1,2,3</sup> *Riga Technical University, 6 Kalnciema str., Riga, LV1048, Latvia.*

*E-mails: <sup>1</sup>guna.ciemleja@rtu.lv; <sup>2</sup>natalja.lace@rtu.lv; <sup>3</sup>jelena.titko@rtu.lv*

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**Abstract.** The level of citizens' financial knowledge has a great impact on financial well-being of individuals and society. In this regard public authorities in many countries initiated a process of development and implementation of National strategies to enhance financial literacy level. The initial step of developing a national strategy is evaluation of current situation. Thus, financial literacy measuring issues are frequently debated in the academic and public environment. The goal of the current research is to develop a measurement instrument to evaluate the level of financial knowledge of Latvian citizens. The present paper reflects the results of the authors' conducted survey based on the sample of 169 respondents. A set of 12 questions on financial matters was developed to detect perceived importance and complexity of financial literacy components, as well as to get financial literacy self-assessment scores. Data was processed by means of SPSS, applying such methods, as analysis of means, analysis of frequencies and independent samples t-test. Received results assist to precise the content and wording of questions to be included into the questionnaire for evaluation financial literacy level of Latvian citizens<sup>1</sup>.

**Keywords:** financial literacy, measurement, evaluation, survey, Latvia

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**JEL Classifications:** G100; G11

### 1. Introduction

Financial literacy (FL), its importance, measuring issues, implementation of financial education programmes and related topics economic security and sustainability are frequently discussed in academic and public environment (Makštutis *et al.* 2012; Lavrinovich *et al.* 2012; Vasiliūnaitė 2014). High level of financial literacy makes a large contribution to the financial well-being of individuals, because financially literate people are more likely to plan for retirement (Almenberg, Save-Soderbergh 2011; Caurkubule, Rubanovskis 2014), more likely to par-

ticipate in financial markets and perform better on their portfolio choice (van Rooij *et al.* 2011), as well as they accumulate higher amounts of wealth (Lusardi, Mitchell 2011). In turn "lack of financial literacy was one of the factors contributing to ill-informed financial decisions and that these decisions could, in turn, have tremendous negative spill-over" (PISA/OECD 2012). In many countries governments are increasingly concerned about financial illiteracy of their citizens. In Latvia, the issues of the improvement of financial literacy level are emphasized at the government level.

According to the National Development Plan of Latvia for 2014-2020 (CCSC 2012) human economic security and citizens' resilience are on the

<sup>1</sup> This study was conducted within the scope of the research „Enhancing Latvian Citizens' Securability through Development of the Financial Literacy” Nr. 394/2012.

agenda. Economic security means that citizens have predictable and sufficient income that, in turn, implies the high level of financial literacy. Following the experience of other countries, in 2014 strategic partners (Financial and Capital Market Commission (FCMC), Ministry of Education and Science, National Centre for Education, BA School of Business and Finance, Consumer Rights Protection Centre, Association of Commercial Banks of Latvia and Latvian Insurers Association) signed the memorandum on the implementation of the National Strategy for Financial Literacy in Latvia 2014–2020 “aimed at promoting a progressive rise in the public financial literacy” (FCMC 2014).

An important step in defining a national strategy is measuring of a current level of financial literacy, because it provides an evidence of the issues faced by different socio-demographic groups, enables policymakers to identify the needs of the population, provides a baseline for designing educational programmes, and etc. In turn, measuring process requires a clear understanding of financial literacy concept and an appropriate evaluation instrument.

The goal of the present research is to develop a measurement instrument (questionnaire) to evaluate the level of financial knowledge of Latvian citizens. To achieve the established goal the authors conducted a pilot study that was aimed: (1) evaluate perceived importance of financial literacy components from the viewpoint of different respondent groups, (2) evaluate respondents' perceived complexity of financial literacy components, and (3) test self-assessed level of financial literacy of respondents. The survey among different groups of Latvian citizens was performed, using the simplified measurement scale with 12 questions representing all the components of financial literacy. The results of the study are reflected in the current paper.

Data processing was conducted by means of SPSS 20.0 software. Such methods, as analysis of means, analysis of frequencies and independent samples t-test were applied. To get a comprehensive picture of respondents' perceptions of financial literacy questions, responses of particular groups of respondents were analysed separately, considering socio-demographic characteristics of citizens. Research findings allowed the authors to precise the content and the structure of the questionnaire. Conclusions drawn from the received results indicated several key points

in regards to wording of the questions and highlighted possible issues related to the data processing.

## **2. Defining and Measuring Financial Literacy**

Results of various researches in the field of financial literacy indicate the fact that there is no consistent approach to understanding of the concept. A clear conceptual framework for understanding the concept of financial literacy is necessary to build a theoretical foundation for development of the methodology of financial literacy evaluation.

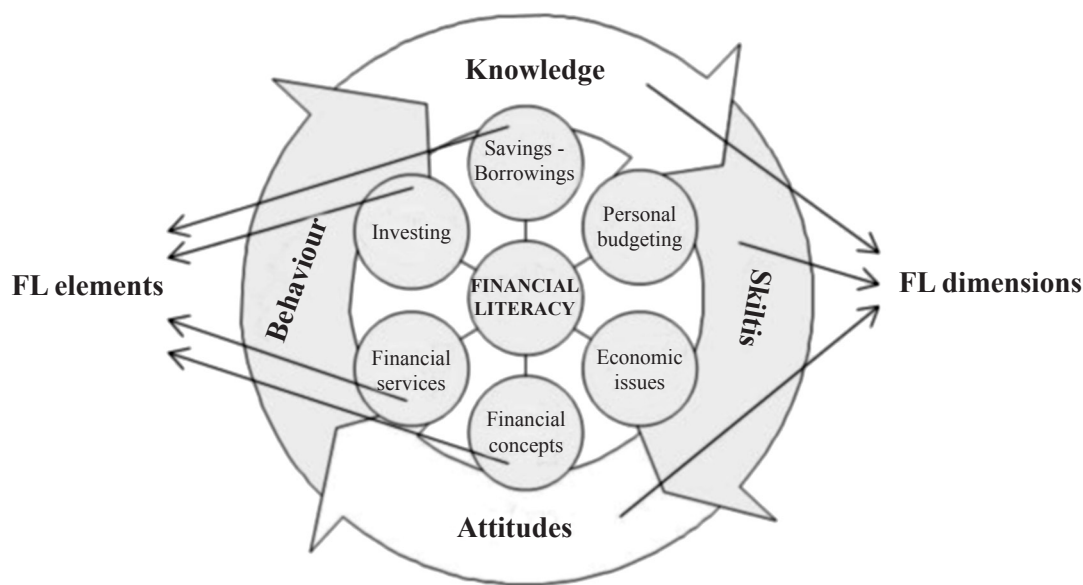
Different organizations and individual researches define financial literacy in a specific manner, emphasizing different aspects. Most often financial literacy is defined as (1) a financial knowledge (FINRA 2010), (2) financial skills (Kozup, Hogarth 2008), (3) financial behavior (ASIC 2011) or a certain combination of elements (Atkinson, Messy 2011; Hung *et al.* 2009; PISA/OECD 2012; Widdowson, Kim 2007). As for particular elements, Gerardi *et al.* (2010) decomposes the concept into money literacy, price literacy and budget literacy. According to Kefela (2011), thematic areas for studying financial literacy are budgeting, savings, debt management, financial negotiations and bank services. Remund (2010) defines five categories: (1) knowledge of financial concepts, (2) ability to communicate about financial concepts, (3) aptitude in managing personal finances, (4) skill in making appropriate financial decisions and (5) confidence in planning effectively for future financial needs. Experts from the Financial Services Authority (FSA), emphasize such elements of financial literacy, as (1) managing money, (2) planning ahead, (3) making choices, and (4) getting help (FSA 2005).

Considering the existing variety of understanding the concept of financial literacy, it is clear why methodological approaches to financial literacy assessment differ so widely. Measuring the level of financial literacy, different researchers emphasize: 1) the issues associated with retirement wealth accumulation (Almenberg, Save-Soderbergh 2011; Lusardi, Mitchell 2011); 2) evidence and implications for financial education programmes (Lusardi, Mitchell 2007; Mandell, Klein 2009); 3) the link between wealth accumulation and financial literacy (Behrman *et al.* 2012); 4) the interconnection between financial crisis, debt behaviour and financial literacy (Lusardi, Tufano 2009).

Ambiguous viewpoints about the concept of financial literacy generated a need for applying statistical methods in the analysis of the definitions. The explorative research on defining financial literacy and its components was conducted by the authors by means of AQUAD 6.0 and Hamlet II (Titko, Lace 2013). A comprehensive set of definitions of the term “financial literacy” extracted from the scientific papers and official documents was analysed using such methods, as content analysis, analysis of joint frequencies and cluster analysis.

Research results indicated that financial literacy most often is defined as a set of cognitive (knowledge and

skills) and behavioural attributes. Non-cognitive terms, such as motivation or confidence, are not mentioned so frequently. However, people confidence, motivation and beliefs are all the contributing factors to a person's self-efficacy. In turn, financial self-efficacy plays a crucial role in promoting economic prosperity (Lapp 2010). It was confirmed that financial self-efficacy correlates with financial literacy scores (ANZ/The Social Research Center 2011). This is the reasons why *attitudes* are among financial literacy dimensions (Robson 2012; Atkinson, Messy 2011). The results of the authors' conducted research were expressed in the conceptual model of financial literacy (Figure 1).



**Fig.1.** Conceptual model of financial literacy

Source: Titko *et al.* (2013)

Knowing the components of the concept is the first step in the process of designing a questionnaire to measure a level of financial literacy. Another important issue in measuring process is a proper wording of questions. Sometimes lack of financial knowledge points to the fact that respondents simply did not understand the questions, i. e., “low scores are due to not understanding the questions being asked, rather than understanding the question but answering it incorrectly” (Capuano, Ramsay 2011). Thus, the questions should be properly formulated. Besides, it is necessary to weight questions according its complexity to detect a relevant contribution of each question to the overall index of financial literacy. There are different opinions among the researchers about self-assessment questions.

These questions should be used in surveys with cautions, because people tend to overestimate their knowledge (Guiso, Jappelli 2008; Capuano, Ramsay 2011).

Despite of variety of measurement instruments used in previously conducted studies, there are several barriers for using existing questionnaires in Latvia:

- the content of questionnaires is not relevant to the Latvian economic reality;
- the questions are mainly aimed to test elementary numeracy instead of respondents' financial knowledge and ability to deal with financial issues;
- questionnaires involve questions on financial products and instruments that are not available in Latvia.

Thus, the measurement instrument (questionnaire) to evaluate the level of financial knowledge of Latvian citizens should be based on the authors' developed conceptual model of financial literacy (Figure 1) and all the revealed elements should be incorporated into the measurement scale.

### 3. Methodology and sample data

To achieve the research objectives, the authors constructed 12-question instrument with 2 questions

related to each component of the developed conceptual model. The questions represented not only knowledge dimension of the financial literacy, but also behavioural dimension. It should be emphasized large-scale survey on measuring financial literacy level is planned to be performed within only knowledge dimension, i. e., respondents will be offered to pass multiple choice test with only one correct answer.

For research purposes the questions were labelled with appropriate combinations of words (see Table 1).

**Table 1.** Design of the questionnaire for the pilot study

No.	Element	Label	Content of the question
Q1	Savings – Borrowings	Loans	How to borrow money for different purposes? What are the differences between the types of loans (mortgage loan, short-term loan...)?
Q2		Deposits	What should you pay attention to when making a deposit in a bank?
Q3	Personal budgeting	Spending	How much of your income do you spend for meals, utility bills etc.? How much do you spend in a particular period of time?
Q4		Balance sheet	How to prepare a balance sheet of your personal finance in order to evaluate your current financial situation?
Q5	Economic issues	Employment and inflation	What is the relationship between employment and inflation?
Q6		Purchasing power	How to evaluate the impact of inflation on the purchasing power of money?
Q7	Financial concepts	Time value of money	What does it mean „time value of money“?
Q8		Risk and return	What is the relationship between risk and return?
Q9	Financial services	Payments cards	How to choose a payment card? What are the differences between debit and credit cards?
Q10		Online bank services	What online services are available in a bank? How much you should pay for them?
Q11	Investing	Stocks and bonds	How to analyse stocks and bonds before making an investment?
Q12		Diversification	What option is more risky – investment into the shares of one company or investment into different companies, using the same amount of money?

*Source:* authors

Respondents were not asked to answer to these questions, but to evaluate them according three criteria, using 5-point scale:

1. Simplicity of wording (1 – it is hard to understand a question; 5 – it is easy to understand).
2. Importance (1 – absolutely non-important question; 5 - very important question).
3. Complexity (1 –complicated question; 5 – elementary question).

The developed questionnaire for evaluating financial literacy components was disseminated among the students of Riga Technical University, University of Latvia, Latvian Academy of Sport Education, and Art Academy of Latvia (“students”), as well as among other groups of Latvian citizens of different ages,

gender, education level and social status (“adults”).

The 169 fully-completed questionnaires were received. About two thirds of the respondents are females and one third is males (38 per cent and 62 per cent, respectively). Sample contains 55% “students” and 45% “adults”. The most respondents are between the ages of 18 and 25 (58%), 33% of respondents are 26 – 62 years old, and the remaining 9% are citizens older than 62 years (the age of retirement in Latvia). As for education field, 24% of respondents are students or graduates from economics/finance and related programmes, the rest being students and graduates from non-economic faculties. Respondents' profile data is presented in the Table 2.



**Table 2.** Respondent profile

Criteria	Values of criteria	Number of respondents	Comments
Age	18 - 25	58%	Percentage of total number of the respondents
	26 - 30	7%	
	31 - 45	12%	
	46 - 62	14%	
	over 62	9%	
Education field	Economics, finances	24%	Percentage of total number of the respondents
	Other field	76%	
Education level	Primary education	3%	Percentage of total number of „adults”
	Secondary education	36%	
	Higher education (1 <sup>st</sup> level)	29%	
	Higher education (2 <sup>nd</sup> level)	32%	

Source: authors

Values for the criterion „Education level” were determined, based on the simplified interpretation of the regulations issued by the Latvian Cabinet of Ministers on Classification of Latvian education:

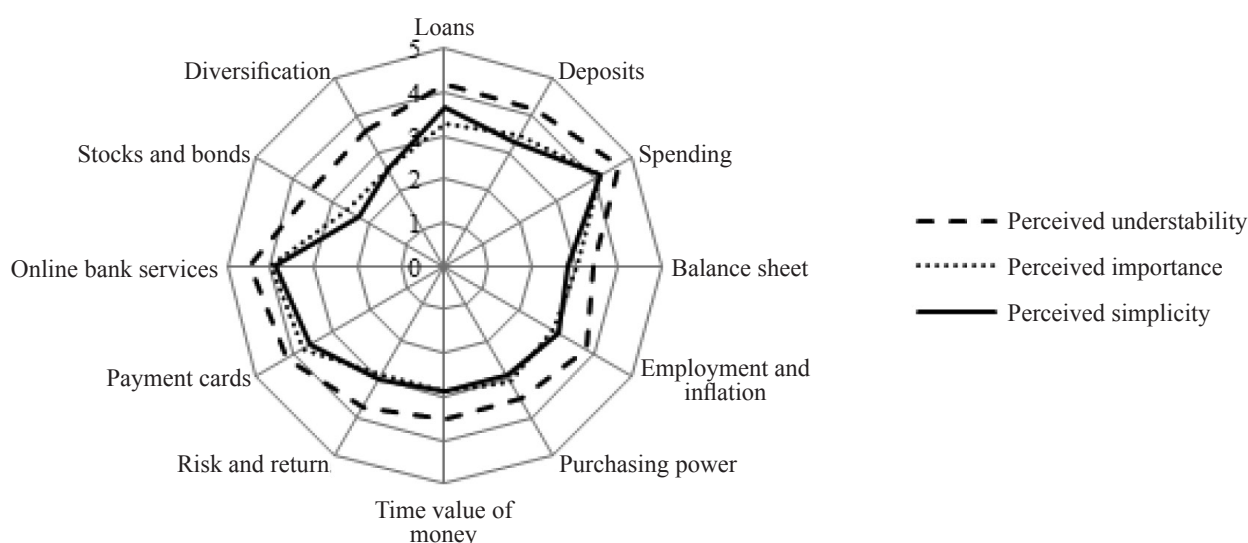
- Primary education – general education program, 1-9 classes;
- Secondary education – general education program, 10-12 classes;
- Higher education: 1st level – bachelor degree;
- Higher education, 2nd level – master degree.

The analysis of the received data was performed in SPSS 20.0. In the first stage the whole data array was processed to get the mean scores of all the responses

to all the questions according to three criteria. Subsequently, respondents were divided into target groups according to the respondent profile questions. When it was possible to split respondents into only two groups (for instance, based on the education field), data was analysed using independent samples t-test to find out the statistically significant difference in the respondents’ responses.

#### 4. Results

The initial results of data processing - the mean scores of responses for each criterion - are presented in the Figure 2.

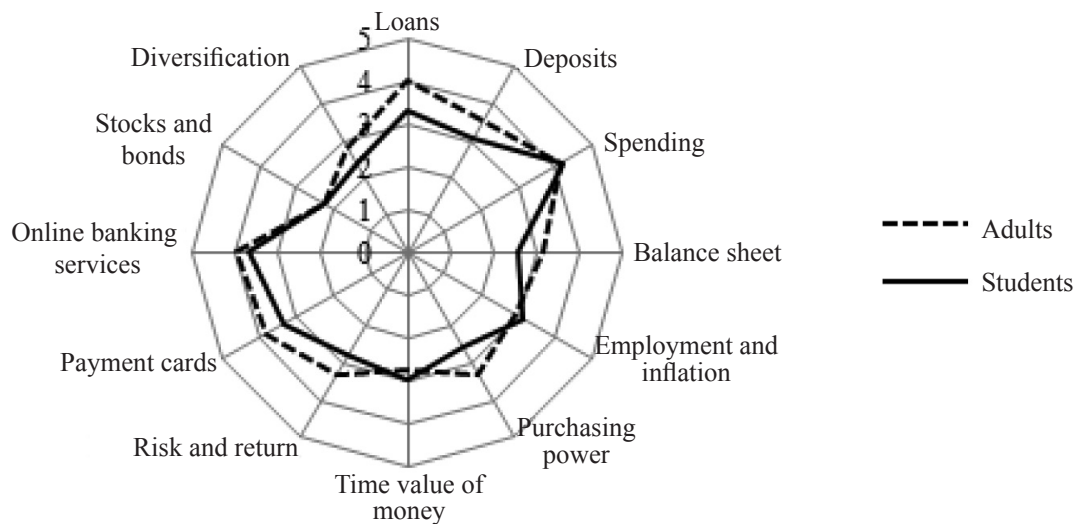


**Fig.2.** Assessment of questions – mean scores for each criterion

Source: authors

From the viewpoint of all the respondents the most simple, the most clearly formulated and the most important questions are “spending”, “online banking services”, “loans”, “payment cards” and “deposits”. According to the criterion “simplicity of wording”, the most respondents evaluated the questions “spending” (75%), “payment cards” (58%), and “online banking services” (67%) as the easiest questions to understand. In turn, the worst worded questions are “time value of money” and “stocks and bonds”. The highest perceived importance was assigned to the questions “spending” and “online banking services”: these questions were marked with “5” by 51 per cent and 44 per cent of respondents respectively. The least

important questions represent the element “investing”: “stocks and bonds” (32%) and “diversification” (30%). As for complexity, the questions “spending” and “online banking services” are perceived as the most simple and easiest to answer by respondents (51 per cent and 40 per cent respectively). In turn, the most complex questions are “stocks and bonds” (40%) and “diversification” (35%). Analysing the responses of particular groups of respondents, several important conclusions were made. In particular, the results revealed the fact that “adults” demonstrated higher self-assessment scores than current students in the age below 25 (Figure 3).



**Fig. 3.** Perceived complexity of the questions by “adults” and “students”

*Source: authors*

In this regards the very important step in the process of evaluation of financial literacy level is a comparison between respondents’ self-assessment scores and their demonstrated level of financial knowledge. Thus, the questionnaire should include both types of questions.

To determine the difference between the perception of questions by “adults” and “students”, data was processed, using *Independent samples t-test* in SPSS environment. The gap between average scores given by two groups of respondents and statistical significance of the difference (Sig.) is demonstrated in the Table 3.

**Table 3.** Evaluation gap: “adults” vs. “students”

Question	Simplicity of wording		Importance		Complexity	
	GAP	Sig.	GAP	Sig.	GAP	Sig.
Loans	,44737	<b>0,003</b>	-,01882	> 0,05	,69892	<b>0,000</b>
Deposits	,52858	<b>0,001</b>	-,21703	> 0,05	,48331	<b>0,014</b>
Spending	-,04825	> 0,05	,16398	> 0,05	-,01415	> 0,05
Balance sheet	,20048	> 0,05	,38144	> 0,05	,56890	<b>0,003</b>
Employment and inflation	,11927	> 0,05	-,32559	> 0,05	-,17091	> 0,05
Purchasing power	,79683	<b>0,000</b>	,56197	<b>0,009</b>	,74109	<b>0,000</b>
Time value of money	-,18831	> 0,05	-,11135	> 0,05	-,23925	> 0,05
Risk and return	,59748	<b>0,002</b>	-,13045	> 0,05	,49377	<b>0,018</b>
Payments cards	,49278	<b>0,007</b>	,07385	> 0,05	,47411	<b>0,017</b>
Online bank services	,03282	> 0,05	-,02872	> 0,05	,28198	> 0,05
Stocks and bonds	,49915	<b>0,022</b>	-,20855	> 0,05	-,04513	> 0,05
Diversification	,88059	<b>0,000</b>	-,28862	> 0,05	,46336	<b>0,043</b>

Source: authors

Respondents from both groups evaluate the questions equally according to the importance criterion: evaluations differ with the statistical significance Sig. < 0,05 only for the question “purchasing power”. However, evaluating the questions by their complexity and simplicity of wording, essential disagreement is observed among the respondents. Using both criteria, almost all the questions “adults” evaluate higher than “students”. It means that the questions seem to be easier to answer and easier to understand for “adults”. The results, in turn, can be explained either by broader financial experience of “adults” or by

higher level of self-assessment.

An independent samples t-test was applied also for processing two data sets representing the viewpoint of “economists” and “non-economists”. The authors take for “economists” all the students of economics-related programs (finance, taxes etc.), as well as “adults” with economic education.

The gap between average scores given by two groups of respondents and statistical significance of the difference (Sig.) is demonstrated in the Table 4.

**Table 4.** Evaluation gap: “economists” vs. “non-economists”

Question	Simplicity of wording		Importance		Complexity	
	GAP	Sig.	GAP	Sig.	GAP	Sig.
Loans	,32597	> 0,05	,73973	<b>0,002</b>	,53663	<b>0,008</b>
Deposits	,32074	> 0,05	,83643	<b>0,000</b>	,64147	<b>0,004</b>
Spending	,10484	> 0,05	,31473	<b>0,044</b>	,20872	> 0,05
Balance sheet	-,10911	> 0,05	,12674	> 0,05	,08779	> 0,05
Employment and inflation	,67035	<b>0,002</b>	,34531	> 0,05	,89554	<b>0,000</b>
Purchasing power	,54516	<b>0,027</b>	,83953	<b>0,001</b>	,71182	<b>0,003</b>
Time value of money	,64167	<b>0,008</b>	,70233	<b>0,003</b>	,77733	<b>0,001</b>
Risk and return	,70310	<b>0,001</b>	,44205	> 0,05	,63178	<b>0,010</b>
Payments cards	,76725	<b>0,000</b>	,58934	<b>0,011</b>	,63140	<b>0,002</b>
Online bank services	,48391	<b>0,000</b>	,45678	<b>0,033</b>	,41531	<b>0,019</b>
Stocks and bonds	,63566	<b>0,012</b>	,73740	<b>0,003</b>	,78798	<b>0,001</b>
Diversification	1,02442	<b>0,000</b>	,87791	<b>0,000</b>	1,08217	<b>0,000</b>

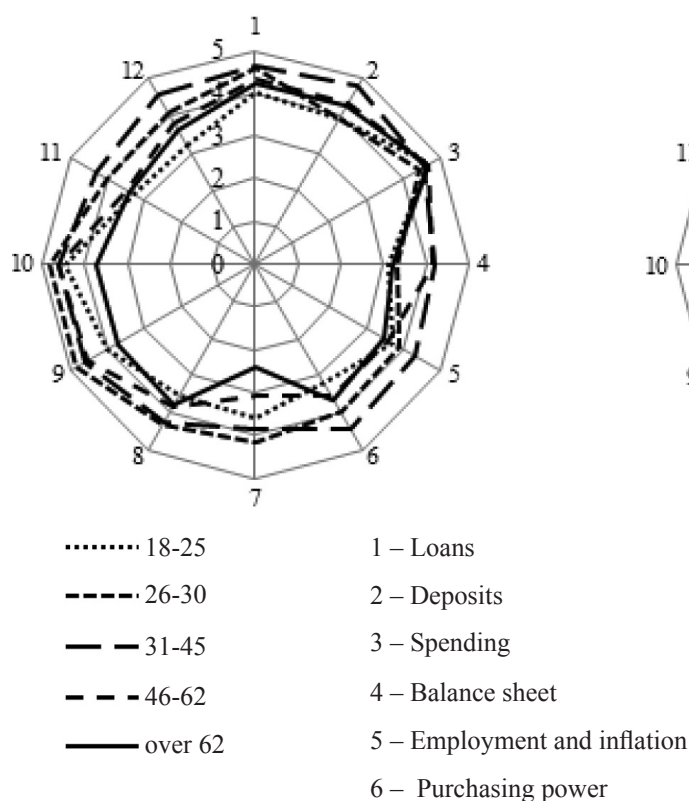
Source: authors

Table 4 data indicates the fact that respondents with the economic education perceive financial questions as less complicated and more important comparing with the other respondents. Results are aligned with general logical assumptions. Financial knowledge was acquired by “economists” during the studying process on a mandatory basis. In turn, “non-economists” learn financial matters in practice and get financial knowledge with a life experience only. To compete with “economists” they should have a strong self-education motivation.

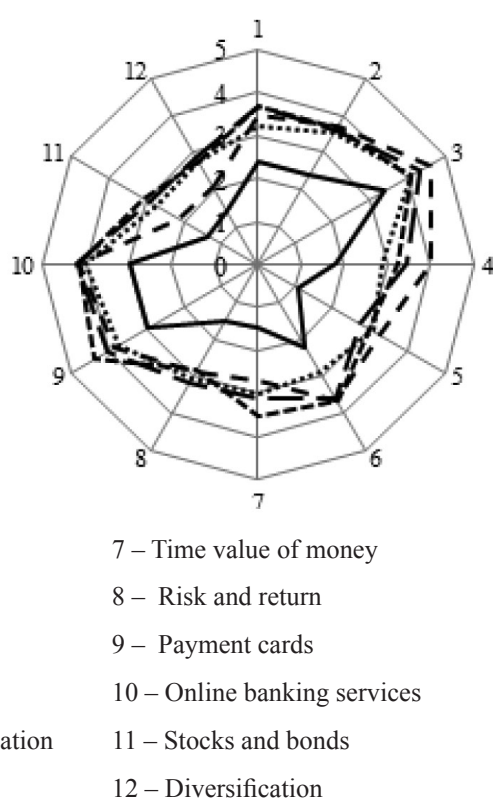
Responses were analysed also considering the age of respondents. Highest evaluation scores assigned to almost all the questions were demonstrated by the respondent group in the age 31-45 years old. In turn, citizens in the age over 62 (age of retirement in Lat-

via) consider the questions as more difficult to understand aside from those related to daily financial decisions (utility bills payments, savings and borrowing). The aged people do not understand questions in regards to economics and financial concepts (Figure 4). Besides, they do not see them as important ones (Figure 5).

Many questions are not clear for the respondents in the age below 25. This fact can be explained with a lack of life experience. For instance, survey results indicate the fact that in Latvia the average age of a mortgage loan user is 35 years, but of life insurance user – 37 years old. Besides, the most of “students” participated in the survey are studying in the field that is absolutely not related to economics or finance (pedagogy, art, chemistry, sports).



**Fig.4.** Simplicity of wording perceived by respondents of different age



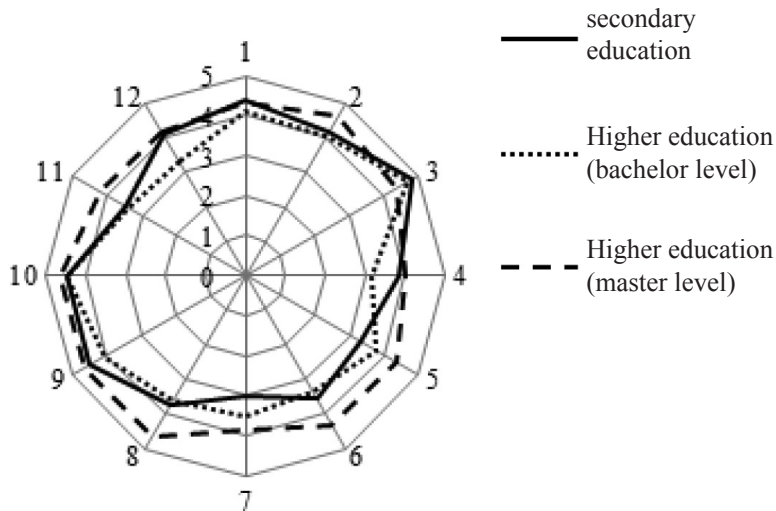
**Fig.5.** Perceived importance by respondents of different age

Source: authors

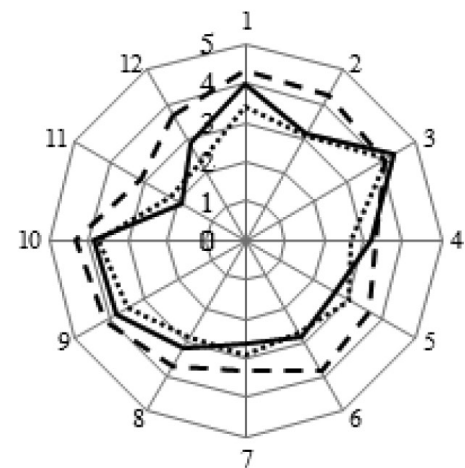
Designing and implementing a national strategy for enhancing financial literacy level, one of the key issues is to improve the educational system. Thus, it is critically important to evaluate financial knowledge of citizens in regards to their educational background.

Survey results demonstrate the essential difference in the perception of financial questions among the respondents with different level of education (Figure 6, 7 – see labels of questions in the Figure 4, 5).





**Fig.6.** Simplicity of wording perceived by respondents of different level of education



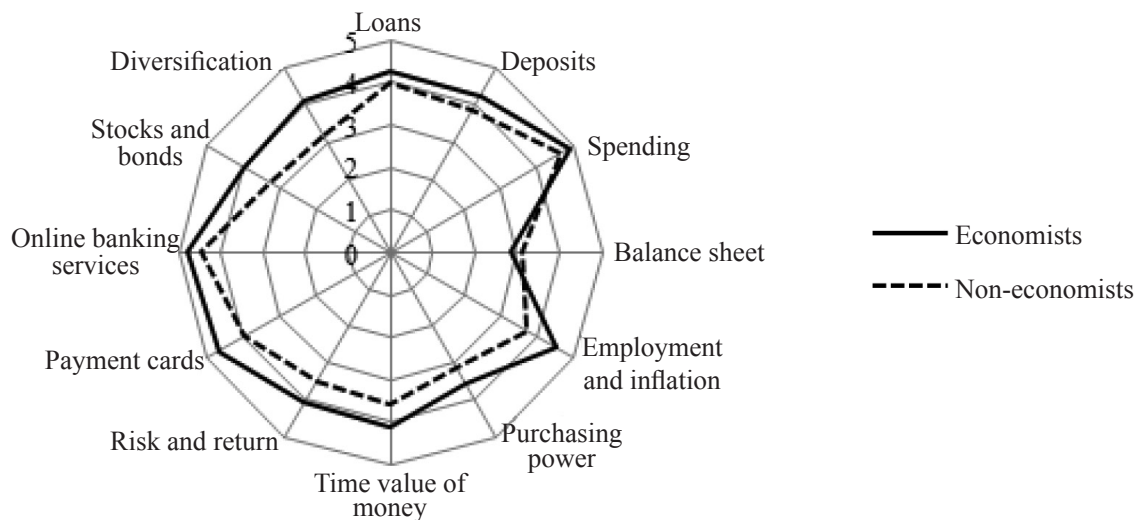
**Fig.7.** Perceived complexity by respondents of different level of education

Source: authors

The survey results demonstrated in the Figure 6 and 7 point to the fact that master level graduates perceive financial questions as less complicated comparing with the other respondents. Evaluation of the questions provided by bachelors does not differ strongly from the scores of respondents with completed sec-

ondary education.

However the in-depth analysis of the responses of bachelors (splitting them into “economists” and “non-economists”) revealed obvious differences (Figure 8).



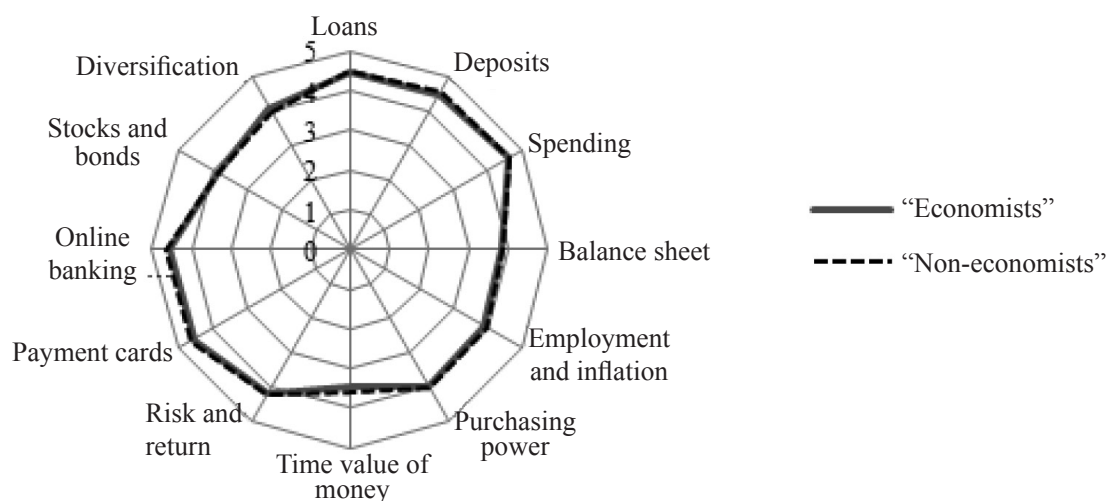
**Fig.8.** Simplicity of wording perceived by bachelor students

Source: authors

It should be emphasized that the analysis of survey results should be done with the extreme attention to the respondent profile data. In the current survey there were no master students within the sample. In turn, “adults” were mostly represented by the respondents with master level education and secondary education.

Besides, it is important to avoid the overgeneralization. It can be illustrated by the simple example from the given study. Respondents with economic education – both graduates and current students of economics-related programmes – evaluated the questions as more important, easier to understand and easier to answer. However, analysing the responses

received from the respondents with master level education, no significant difference between “economists” and “non-economists” was revealed (Figure 9).



**Fig. 9.** Simplicity of wording perceived by “adults” with master level education

*Source: authors*

It means, in turn, that the level of education probably is more important factor than the field of education. However, such assumptions should be confirmed or rejected during the large-scale survey. The only conclusion can be made at the moment that all the facets of survey results should be studied, considering the impact of respondents' characteristics.

## Conclusions

The current paper reflects the results of the pilot study conducted by the academic staff of the Department of Finance of Riga Technical University within the framework of the research project “Enhancing Latvian Citizens' Securability through Development of the Financial Literacy”.

The study was aimed to develop a basis for constructing a measurement instrument that could be used to evaluate financial literacy level of Latvian citizens. The set of twelve questions on financial matters was designed for study purposes. Respondents were offered to evaluate these questions according to three criteria: 1) simplicity of wording, 2) perceived importance, and 3) perceived complexity.

Based on the received data, the results are summarized, as follows:

- The questions “spending”, “online banking services”, “loans”, “payment cards” and “deposits” are the

easiest questions to understand, the most important and the simplest questions. In turn, the most complicated and the less important questions are “inflation and employment”, “purchasing power”, “stocks and bonds” and “diversification”.

- Self-assessment scores of the “economists” are higher than those of respondents with the background in other educational fields. Besides, financial questions are considered to be more important for graduates and students of the programmes related to economics and finances.

- The significant gap in the perception of the questions is observed, analysing the answers of the respondents of different age groups. The lowest rates to almost all the questions were given by retirees (respondents older than 62 years). Senior respondents demonstrate the lowest understanding of the economic questions and financial concepts. They are also less interested in these questions (as well as all other questions) than the respondents in the other age groups. “Spending” is the most important and the easiest question for those respondents. All the questions were rated higher by the group of respondents aged from 31 to 45. Obviously, respondents over 30 have larger working and life experience. In most cases people have children who should be taken care of. Respondents at this age have faced already various financial issues and problems. Thus, the range of their

financial skills is wider (for instance, they know the process of application for a mortgage loan and etc.).

Received results allowed making important conclusions about the content and wording of questions to be included into the questionnaire for evaluation financial literacy level.

Researchers should avoid using complex questions without providing any explanations. For instance, the questions about financial concepts should be included into a questionnaire in a wording that does not require keeping in mind a definition.

Each question should be weighted according to its complexity to differentiate simple questions (for instance, payments of utility bills) from complex questions (financial instruments and etc.). Otherwise, respondents can receive equal number of scores, answering correctly on both questions, and the total financial literacy score might be misleading.

Respondent profile should contain a number of criteria to define particular groups of population, because “one size fits all” approach yields inaccurate survey results (Capuano, Ramsay 2011). The main purposes of measuring citizens’ financial literacy level are to identify groups with lack of financial knowledge, to find out imperfections in the existing educational system, and to define targets of financial literacy strategy. It would be difficult to achieve these goals without splitting respondents into target groups.

To continue the research the authors will test financial literacy components on sample data of other countries. All the acquired information will be used for development of the measurement instrument for the large-scale survey in Latvia to measure financial literacy level of different target groups of Latvian citizens.

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