

ROUTLEDGE INTERNATIONAL STUDIES IN MONEY  
AND BANKING

# Financial Systems in Troubled Waters

Information, strategies, and  
governance to enhance performances  
in risky times

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ROUTLEDGE 

# 11 Financial education online

## Does it work?

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### 1 Introduction

Surveys devoted to monitoring the financial literacy of consumers are regularly scheduled in different countries (United States, United Kingdom, Australia, etc.). Both governments and international organizations, such as OECD and the European parliament, have tried to evaluate the capability of financial consumers in order to make financial decisions in a proper manner. Different surveys on different countries have reached the same conclusion concerning a general lack of knowledge of financial consumers. These results suggest the need for financial education curricula in order to fill the gap. A more skilled consumer is quite desirable for a lot of reasons. A financially literate consumer is able to understand the features of a financial product or a financial service, making the need for a tight regulatory framework unnecessary. A higher financial literacy enhances the market competition due to the ability of consumers to highlight and understand differences between products and services; while education helps consumers to improve their awareness on their long-term latent needs (e.g. pension planning, savings, etc.) that could otherwise be ignored.

Results from the evaluation of consumers' financial knowledge have led policy makers to support financial education curricula. These curricula were provided both from public and private organizations and to different recipients (college students, university students, workers, etc.) with different training solutions (lessons, advisory, online tools, etc.) targeted.

Following the provision of a large number of curricula, some questions on their effectiveness have arisen and assessment procedures were proposed in order to analyse the ability of these programmes to enhance consumer knowledge and to improve their financial behaviour. This assessment process mainly involved traditional classroom-based courses, while web-based initiatives have been neglected.

In this chapter a contribution to the financial education assessment literature is provided. After a literature review, data from a survey on the Italian market are analysed in order to evaluate the effectiveness of web-based financial education curricula. An analysis by the pre-post test methodology will be followed by results.

## 2 Literature review

Financial literacy and financial education are both topics recently analysed by the literature. The growing sophistication of international financial systems and new regulatory frameworks, where financial consumers are forced to be more independent in taking important financial decisions, suggest to academics and financial authorities to test the financial literacy of the population. This was undertaken mainly in North America (United States and Canada), United Kingdom, Australia and New Zealand. Most of the surveys were devoted to analysing financial literacy within youth, trying to understand the effectiveness of the school programmes on personal finance. Results suggest that financial knowledge and skills are dramatically and persistently low (Chen and Volpe 1998). A poor interest in financial issues and a lack of commitment by the youth, due to their low financial activism, were highlighted as the main indifference factors<sup>1</sup> (McCormick 2009). So, the analysis on financial literacy was extended to adult consumers and tailor made curricula were provided to them. Financial education in the workplace on topics such as pension planning, overindebtedness and bankruptcy are the most common initiatives for these target recipients. Empirical evidences highlight that these curricula are the most effective in developing knowledge and skills in adult consumers, improving their financial behaviour (Garman *et al.* 2002). The teaching solutions and the choice of teachable moments seem to be key variables for the effectiveness of a financial education curriculum. The awareness that they will have to take real financial decisions after the course, tend to improve the commitment of the recipients of the financial education curriculum and leads them to pay more attention during the teaching.

After the analysis of financial literacy within different kind of consumers, a new trend in the literature was developed. Much interest was devoted to the best practices, in order to understand the key elements for an effective financial education curriculum, meanwhile, researchers tried to understand the main problems of ineffective financial education curricula. So the literature on the assessment procedure in financial education has grown. From an analysis of courses with a wide range of possible recipients, developed in a 'one-size-fits all' approach, more targeted initiatives were analysed and some authors considered the impact of the training solutions on the effectiveness of the process. Papers by O'Neil *et al.* (2002), Toussaint-Cameau (2002), Mandell (2006b) and Lyons *et al.* (2006) analysed the power of financial education in order to improve financial literacy of consumers, developing a literature review on the assessment procedures in financial education.

Fox *et al.* (2005) suggest the need of standards in the assessment procedures in order to let different curricula be comparable by time and by different countries. The authors even highlight the conflicts of interest in a self-established assessment procedure where the evaluation on the effectiveness of a curriculum is done by the same organization that provided it.

Other authors such as Lyons (2005), Lyons *et al.* (2006) and Chang and Lyons (2008) argued on the elements that should be included in an assessment

process and what kind of methodology should be preferred, paying attention to the different nature of single initiatives.

So, from the original topic of financial education a step forward into the financial education assessment was taken. Varcoe *et al.* (2005) studied the financial education curricula 'for teens'; Fox and Bartholomae (2006) considered financial education for women and Chang and Lyons (2008) focused on curricula for 'subprime' financial consumers. The results highlight how the enhancement of financial literacy in financial consumers is dependent on different items. Some are manageable by financial education providers (the contents, the teaching solutions, the teaching solutions, the timing of delivery, etc.), others are not, due to the fact that they are related to the characteristics of recipients (age, education, job, financial background, etc.).

The assessment of financial education curricula is far from an easy task. Considering that most of the financial education curricula are financially supported by the government, and the need for the financial education authorities to allocate their resources toward the most effective initiatives, the need to go beyond an overall evaluation of a curriculum is necessary. Questions as 'what is the most deserving recipient target?' (youth, adults, workers, retired, overindebted, minorities, etc.), or 'what are the priorities in the contents to be taught?' (money management, savings, etc.) or 'what is the relevance of a cost-benefit analysis in the sponsorship of single initiatives?' are all elements that make the assessment of financial education curricula quite complex.

From a methodological perspective, the enhancement of consumers' knowledge on financial topics is measured by a pre-post-test analysis. A questionnaire with questions on financial literacy and financial behaviour is provided to a surveyed consumer sample. After the questionnaire, a financial education curriculum is provided and a second questionnaire follows. If the correct answers to the financial literacy questions grow in the second questionnaire from the first one, an enhancement in the consumers' financial knowledge is observed. This pre-post test methodology is quite familiar in the consumer finance research papers, even if some authors highlight some risk of pitfalls (Hill and Perdue 2008); it is widely adopted in the assessment of classroom-based initiatives, but its enforcement in alternative teaching methods, as web-based tools, seems to be feasible.

If the ability of a financial education curriculum to involve its recipients in order to maximize their commitment and their learning outcomes is a function of the teacher's ability and dependent on the quality of the teaching materials,<sup>2</sup> in a learning-by-doing process the empirical cases are not ancillary to a theoretical concept, but are a fundamental part of the learning process themselves. In a learning-by-doing curriculum the border line between knowledge and application fade. The analysis of real (or realistic) situations is used in order to close the distance between theory and practice as much as possible. A path-dependent tool or the use of simulator in an iterative manner helps the recipient to understand the consequences of different choices and the connection between input information and outputs of a decisional process. The more the tool will be able to

replicate a real situation the higher the likelihood for the recipient to develop skills and attitudes from knowledge (Kempson *et al.* 2006).

The aim of this chapter is to evaluate the effectiveness of an online learning-by-doing financial education curriculum. Using data from the Italian market, an analysis of the enhancement of consumer knowledge and behaviour will be carried out by the pre–post test methodology mentioned above.

### **3 Data and methodology**

A questionnaire on financial literacy topics was prepared and surveyed to a sample of Italian consumers. Questions related mostly to consumer credit topics (instalments, APR, interest rates, etc.).

The questionnaire comprised three sections. The first section contained questions on personal characteristics, and data on age, job, education, marital status, residence and housing condition (property, property with mortgage, rent, etc.) were collected. These control variables are useful in order to investigate differences in the effectiveness of the assessed financial education curriculum on different consumer groups.

Financial behaviours and previous financial experiences of consumers were investigated in the second section: questions concerning (a) previous mortgage experiences, (b) how frequently the consumer checks his balance account, (c) knowledge of the disposable amount in the bank balance account, (d) the saving to income ratio and (e) questions on the use of payments cards were included. Taking into account a hypothetical mortgage and their disposal income, consumers were asked to appraise the highest value of a sustainable instalment. A self-estimation of their financial stability in a 0–10 scale was also requested. The definition provided to the consumers in order to clarify the concept of personal financial stability concerns the likelihood to become systematically in arrears with financial and non-financial payments within 12 months. This information was used to test the hypothesis that previous financial experiences could affect (positively) consumer financial literacy and skills, and to test the consumer's ability to self-estimate his financial situation. The comparison of the variable in the pre–post-test is useful in order to evaluate the power of the tool to improve the consumer's awareness on his financial stability.

The third section of the questionnaire comprised ten multiple-choice questions on (a) credit contracts, (b) how to use them and (c) financial jargon.

Due to the web-based nature of the assessed tool, a web-based questionnaire was implemented. The surveyed consumers completed a questionnaire via a website with the assistance of a tutor. Consumers with higher technological skills used the tutorship only rarely. In other cases the tutor acted as a human interface, providing technological support and sometimes populating the questionnaire with the consumers' answers.

With the aim to maximize the response rate of the survey, the questionnaire was structured to be absolutely anonymous and to avoid private or sensitive

information (e.g. total income or total assets data were not surveyed). The sample size is equal to 774 observations randomly collected.

The requirements to be part of the survey were to have Italian citizenship and be a minimum of 18 years old.

According to the pre-post test methodology, the questionnaire was initially completed by the consumers in order to evaluate the starting level of their financial literacy. After the questionnaire, consumers used the web-tool *Monitorata*<sup>®3</sup> for an average time period of 30 minutes, prior to completing the same questionnaire a second time. Consumers were encouraged to use the tool in different manners. The tool provides a budget analysis and a financial stability index measure related to the probability of being in financial distress within 12 months. Consumers were invited to use it initially with their real personal data, in order to receive an awareness of their financial risk, then it was suggested they change the data in order to evaluate the consequences that possible financial events (e.g. drop in total income due to unemployment, unexpected financial outgoing due to illness, etc.) or different financial behaviour (e.g. the adoption of more expensive life-standards, a new mortgage, etc.) could have on their personal financial stability.

The effectiveness of the tool in enhancing consumer knowledge and behaviour was assessed by two different parameters. Consumers' knowledge was analysed by the distance between the number of correct answers in the consumer credit knowledge questions in the post-test and in the pre-test. An upgrade of the variable is associated with an enhancement in financial knowledge and, consequently, with an evidence on the effectiveness of the tool.

The behaviour of the consumer and his awareness about his real financial stability was analysed too. Even if the real financial behaviour can't be assessed by a questionnaire and its evaluation requires long-term monitoring of consumers' financial decisions, if in the second questionnaire a consumer changes his self-estimation about the maximum sustainable instalment for a hypothetical debt, this change can be interpreted as a behavioural change itself or can be seen as an awareness enhancement that should lead to a behavioural change.

Both the knowledge and behavioural analysis have been replicated on different sub-samples where consumers with comparable education have been clustered. This sub-sample analysis was performed in order to test the hypothesis that the effectiveness of the tool could be affected by the consumer's education.

A statistical hypothesis test (*t*-test) was implemented. The distance between the average value of the total correct answers on financial knowledge questions in the pre- and post-test were tested to understand if the tool was able to enhance consumer knowledge or not. A significant positive value for this variable will support the underlying hypothesis that the tool is effective. The average value of the variable obtained by the distance between the self-estimated maximum sustainable instalment in the pre- and post-test was analysed to highlight the likelihood that it substantially differs from zero. Considering that a positive value of the variable will be associated with the ability of the tool to change the consumer's perception of their financial situation, we test the null hypothesis that the variable is always not significant (in average equal to zero). Due the fact that

both positive and negative changes between the pre- and post-test value are associated with behavioural changes, the differences between surveys has been calculated in absolute terms.

#### **4 Results**

Prior to analysing the results of the chapter, a few descriptive statistics of the sample are presented to summarize the dataset (Table 11.1):

Due to the sample size (774 observations), the results' reliability should be guaranteed. At the same time the short period of observation should avoid the risk of biases related to an exogenous change in the consumers' knowledge.

The average age of consumers (37.9 years) is lower than the average age of the Italian population (42.8 years<sup>4</sup>), but it is compliant with the target recipients of the tool. Monitorata is a web-based tool that is available only via the Internet. The decision to provide it only by the web excludes consumers without an Internet connection or without the technological skills required to browse in it. The distance between the age of the sample and the mean value of the Italian population can be explained due to the fact that the elderly face higher technological barriers.

The geographical distribution of the sample seems to be almost equally weighted through different areas; while the sample distribution by education, job and marital status seems to show no biases.

Table 11.2 shows the results on consumer enhancement in financial knowledge and consumer credit.

The results in Table 11.2 show the effectiveness of the tool in order to enhance consumer knowledge on consumer credit. Data from the whole sample show that the percentage of correct answers in the pre-test (equal to 49.03 per cent) increased by 8.23 per cent in the post-test. Data from education sub-samples highlight how the effectiveness of the tool is quite different between different education clusters. Even if all the consumers in every education cluster increase their values, the results for primary school, bachelor in economics/finance and PhD are not statistically significant. For primary school and PhD groups the small size of the sub-samples could be problematic. Data for the bachelor in economics or finance sub-group can be explained both with the high initial knowledge (65.71 per cent of correct answers in the pre-test) and the low number of knowledge questions. The hypothesis test has been implemented on the percentage value of the increase of knowledge and the high initial levels for this group tend to underestimate the changes.

Data from other sub-samples are statistically significant and show that the higher the consumer's education the lower is the effectiveness of the tool in increasing their financial knowledge. The masters group is the only exception, which can be explained both with the small sub-sample size and the heterogeneity of the group. In the masters group both financial and non-financial degrees are included, so the possibility that in the sub-sample the percentage of non-financial degree consumers is predominant could explain the high increase in the rate of knowledge (+10 per cent).

Table 11.1 Descriptive statistics

<i>Variable</i>	<i>Value or percentage</i>
Age	
• Mean (year)	37.90
• Min	18.00
• Max	81.00
• Standard deviation	11.39
Geographical area	
• North (%)	22.64
• Centre (%)	39.79
• South (%)	33.45
• Islands (Sardinia and Sicily) (%)	4.12
Total (%)	100
Education	
• Primary school (%)	4.41
• Middle school (%)	11.17
• High school (%)	51.33
• University-bachelor (economics, finance) (%)	6.87
• University-bachelor (other than economics or finance) (%)	21.65
• University-master (%)	2.72
• PhD (%)	1.86
Total (%)	100
Job	
• Fix-term job (%)	15.92
• Permanent contract job (%)	34.59
• Housewife (%)	3.77
• Laid off – government aid (%)	0.00
• Unemployed (%)	2.05
• Self-employed ('lavoratore autonomo') (%)	10.27
• Freelancer ('libero professionista') (%)	6.68
• Retired (%)	5.48
• Without certified incomes (%)	2.74
• College student (economics or finance) (%)	6.51
• College student (other than economics or finance) (%)	11.99
Total (%)	100
Marital status	
• Single (%)	49.14
• Married (%)	37.80
• Cohabitant (%)	5.84
• Separated (%)	3.26
• Divorced (%)	1.55
• Widow or widower (%)	2.41
Total (%)	100
Observations	774
Observation period	2011 (January–February)



Table 11.2 Coherence between correct answers in the pre-test and post-test

Variable	Description	Number of observations	Correct answers pre-test (initial value) (%)	Average increase (%)	Standard deviation (%)/n	Test $H_0 = \text{Null hypothesis}$ $H_1 = \text{Alternative hypothesis}$	P-value $[Pr ( T  >  t )]$
Increase_knowledge_ OVERALL	Increase in the number of correct answers on financial knowledge in the post-test compared with pre-test.	774	49.03	8.28	3.94	$H_0 = \text{Variable} = 0$ $H_1 = \text{Variable} > 0$	0.000***
Increase_knowledge_ Primary	Increase in the number of correct answers on financial knowledge in the post-test compared with pre-test for the sub-sample of consumer with <i>primary school education</i> .	34	27.55	2	27	$H_0 = \text{Variable} = 0$ $H_1 = \text{Variable} > 0$	0.1326
Increase_knowledge_ Middle	Increase in the number of correct answers on financial knowledge in the post-test compared with pre-test for the sub-sample of consumer with <i>middle school education</i> .	86	43.96	16	5.10	$H_0 = \text{Variable} = 0$ $H_1 = \text{Variable} > 0$	0.000***
Increase_knowledge_ High	Increase in the number of correct answers on financial knowledge in the post-test compared with pre-test for the sub-sample of consumer with <i>high school education</i> .	399	44.94	9.01	3.05	$H_0 = \text{Variable} = 0$ $H_1 = \text{Variable} > 0$	0.000***

Increase_knowledge_ BachelorNO-ECO	Increase in the number of correct answers on financial knowledge in the post-test compared with pre-test for the sub-sample of consumer with a <i>bachelor-degree</i> (other than <i>economics or finance</i> )	53	46.03	9.00	3.70	$H_0 = \text{Variable} = 0$ $H_1 = \text{Variable} > 0$	0.005***
Increase_knowledge_ BachelorECO	Increase in the number of correct answers on financial knowledge in the post-test compared with pre-test for the sub-sample of consumer with a <i>bachelor-degree</i> ( <i>economics or finance</i> )	167	65.71	0.10%	0.05%	$H_0 = \text{Variable} = 0$ $H_1 = \text{Variable} > 0$	0.1599
Increase_knowledge_ Master	Increase in the number of correct answers on financial knowledge in the post-test compared with pre-test for the sub-sample of consumer with a <i>master-degree</i>	21	47.14	6.02%	10.01%	$H_0 = \text{Variable} = 0$ $H_1 = \text{Variable} > 0$	0.008***
Increase_knowledge_ PhD	Increase in the number of correct answers on financial knowledge in the post-test compared with pre-test for the sub-sample of consumer with a <i>PhD</i>	14	64.29	0.20%	4.50%	$H_0 = \text{Variable} = 0$ $H_1 = \text{Variable} > 0$	0.1422

Notes

\*\*\*  $p$ -value < 1 per cent, \*\*  $p$ -value < 5 per cent, \*  $p$ -value < 10 per cent.

Table 11.3 Difference between the pre- and post-test value of the self-esteem sustainable instalment value

Variable	Description	Number of observations	Average increase between the pre- and post-test (%)	Standard deviation (%)	Test $H_0 = \text{Null hypothesis}$ $H_1 = \text{Alternative hypothesis}$	P-value $[Pr ( T  >  t )]$
Instalment_OVERALL	Absolute value of the difference between pre-test value self-esteemed sustainable instalment and the post-test ones	774	82.22	42.71	$H_0 = \text{Variable} = 0$ $H_1 = \text{Variable} > 0$	0.000***
Instalment_primary	Absolute value of the difference between pre-test value self-esteemed sustainable instalment and the post-test ones for the sub-sample of consumer with primary school education	34	189.61	77.13	$H_0 = \text{Variable} = 0$ $H_1 = \text{Variable} > 0$	0.0046***
Instalment_middle	Absolute value of the difference between pre-test value self-esteemed sustainable instalment and the post-test ones for the sub-sample of consumer with middle school education	86	146.99	43.17	$H_0 = \text{Variable} = 0$ $H_1 = \text{Variable} > 0$	0.0016***
Instalment_high	Absolute value of the difference between pre-test value self-esteemed sustainable instalment and the post-test ones for the sub-sample of consumer with high school education	399	67.66	39.57	$H_0 = \text{Variable} = 0$ $H_1 = \text{Variable} > 0$	0.000***

Instalment_ BachelorNO-ECO	Absolute value of the difference between pre-test value self-esteemed sustainable instalment and the post-test ones for the sub-sample of consumer with a bachelor-degree (other than economics or finance)	53	63.18	42.67	$H_0 = \text{Variable} = 0$ $H_1 = \text{Variable} > 0$	0.0089***
Instalment_ BachelorECO	Absolute value of the difference between pre-test value self-esteemed sustainable instalment and the post-test ones for the sub-sample of consumer with a bachelor-degree (economics or finance)	167	61.13	38.22	$H_0 = \text{Variable} = 0$ $H_1 = \text{Variable} > 0$	0.0063***
Instalment_Master	Absolute value of the difference between pre-test value self-esteemed sustainable instalment and the post-test ones for the sub-sample of consumer with a master-degree	21	135.93	74.21	$H_0 = \text{Variable} = 0$ $H_1 = \text{Variable} > 0$	0.0963*
Instalment_PhD	Absolute value of the difference between pre-test value self-esteemed sustainable instalment and the post-test ones for the sub-sample of consumer with a PhD	14	82.10	52.15	$H_0 = \text{Variable} = 0$ $H_1 = \text{Variable} > 0$	0.2962

Notes

\*\*\*  $p$ -value < 1 per cent, \*\*  $p$ -value < 5 per cent, \*  $p$ -value < 10 per cent.

In Table 11.3 the behavioural results from the analysis of self-estimated sustainable instalments are summarized. The hypothesis that the tool is able to 'awake' consumers on their real financial capabilities has been tested by an analysis of the change in the consumer self-estimated value of their maximum sustainable instalment. The results highlight that both in the whole sample and in the sub-samples changes in the self-estimated pre- and post-test variables occurred. Looking at the mean values it seems that quite frequently the post-test evaluation is very different from the pre-test one. These changes support the hypothesis that the tool is useful in order to help enhance financial consumers' self-perception.

The small size of primary school and PhD sub-samples tend to shatter the significance of results, even if the *p*-values suggest a robustness from the methodological point of view. All other sub-sample results support the hypothesis that the tool is useful in order to enhance consumer knowledge. So data on financial behaviour confirm what was already found in the knowledge analysis. In both the behavioural analysis and in the knowledge analysis there are evidences on the differing utility of the tool for different targets of recipients and a higher effectiveness of the tool in consumers with lower level of education was found.

## **5 Conclusion**

The assessment of financial education curricula has been recently analysed by the literature and is an ongoing topic. In this chapter an assessment of a web-based financial education tool devoted to Italian consumers has been undertaken; from a survey on the Italian market a pre-post test analysis was implemented in order to evaluate the effectiveness of the tool. This research methodology is based on an analysis of the differences between data from a questionnaire submitted first before a financial education curriculum and the second after it.

In order to analyse the financial literacy enhancement of consumers, the differences in the number of correct answers between the first (initial) and the second (final) questionnaire was used. Data relating to the difference between the two questionnaires of the consumers' self-estimated value of the maximum sustainable instalment of a hypothetical debt was adopted as the key variable for the estimation of the consumer behavioural changes. The hypothesis of effectiveness of the tool – in both the behavioural analysis and in the knowledge analysis – is supported by results. With these results, the effectiveness of financial education on financial consumer characteristics finds new evidence, confirming results of previous studies.

The overall sample analysis was followed by a focus on different sub-samples in order to evaluate the impact of education on the effectiveness of the tool. The analysis highlights that the effectiveness is quite different within sub-groups. Consumers with lower education (primary school and middle school) seemed to benefit from the tool than higher education consumers (graduate and post-graduate consumers). These results suggest the need to take into account the initial level of financial literacy of the recipients in the financial education

curricula in order to avoid misleading results in the assessment procedures. This topic is quite relevant due the fact that most of the financial education curricula are (financially) sponsored by the government and other public organizations. An assessment procedure that ignores education (as other sensitive variables) increases the risk of a suboptimal allocation of the resources by the policy makers.

The lack of data on financial literacy in Italy hinders monitoring on a regular basis currently; this chapter can be seen as an attempt to improve the knowledge on Italian financial consumers. The author hopes that it will contribute to the international debate on the effectiveness of financial education and its assessment procedures.

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### Notes

- 1 Except money management issues, topics related to pension planning, investments and savings don't involve youths in a practical and immediate manner, worsening their interest for financial education curricula.
- 2 The use of examples and references to the real world by the teacher or in the teaching materials helps the recipients to recognize the value of the topics in the course, increasing their commitment.
- 3 The tool 'Monitorata' has been developed by the CCRC – Consumer Credit Research Centre (Laboratorio di ricerca sul credito alle famiglie) of the University of Rome 'Tor Vergata' and Assofin (Italian association of consumer credit financial intermediaries). Database on Italian financial consumers has been provided by Experian Italia. The tool is freely available online, at [www.monitorata.it](http://www.monitorata.it).
- 4 Data from the Italian Statistical Institute (ISTAT 2011), 'Indicatori demografici – Anno 2010'.

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