Financial Literacy among High School Students in the United States:
Evidence from the 2012 Programme for International Student Assessment (PISA)*

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Abstract

This paper uses data from the 2012 Programme for International Student Assessment (PISA) to analyze determinants of financial literacy among 15-year-old high school students in the United States. We look at a sample of 806 students, from 158 high schools throughout the U.S., who took the PISA survey. The average United States financial literacy performance is not statistically different from the OECD average; however, there are large variations in performance within the United States (only one in ten students score in the highest level of financial literacy). Our main finding is that socioeconomic characteristics are the strongest predictors of financial literacy. Students born in households that are one standard deviation richer than the average household (top 84% of the socioeconomic index) have, on average, a financial literacy score that is 35.5 points higher than students who live in the mean household. In addition, we find that a 10% increase in the proportion of math teachers in schools is associated with an 8 point increase in financial literacy score.

1. Introduction

Over the last decades, financial markets in the United States have become increasingly complex. Moreover, the shift from defined benefit (DB) to defined contribution (DC) pension systems has transferred the responsibility to save and invest to the individual. While older American workers will retire with both DB and DC pensions, younger generations will retire in a pension system of mostly DC pensions. Meanwhile, the move away from state-supported pensions coupled with longer life-expectancies means that young people must have sufficient savings to cover longer retirement periods. To ensure retirement security in this new pension system, young workers have to start contributing to their pensions as soon as they start working. In addition, access to credit in the United States is easier than ever and opportunities to borrow are plentiful. Younger workers will have to choose between saving for retirement, purchasing homes, investing, and paying off debts. These financial decisions are complex and require basic knowledge of financial concepts including risk, interest, and inflation. Unfortunately, a majority of workers and, in particular, young ones lack sufficient knowledge and skill to manage this new level of individual responsibility (OECD 2009; Lusardi and Mitchell, 2014).

Financial literacy is an important element of economic and financial stability both for the individual and the economy. For example, the 2008 financial crisis demonstrated that ill-informed financial decisions – often caused by a lack of financial literacy – can have tremendous negative consequences. While recognition for financial literacy is greater than ever, financial illiteracy is widespread and the key determinants of financial literacy are still unknown. Given this unanswered question and the increasing complexity of day-to day financial transactions, the evidence of financial illiteracy raises important policy questions that must be addressed to ensure young adults' economic success (INFE/OECD 2009; OECD 2009; Lusardi 2008).

In 2008, the OECD created the International Network on Financial Education (INFE) to share information, collect evidence, and develop analytical work and policy instruments on key priority areas in financial education. The OECD and INFE identified financial education programs in schools and international measurements of financial literacy of the young as top priority issues. Recognizing a lack of data on financial literacy among the young, they initiated the idea to design a survey that assesses youths' level of financial literacy. Partnering with financial literacy experts around the world, the OECD and INFE developed a set of questions to test students' knowledge of basic financial concepts. These questions were added to the OECD's Program for International Student Assessment (PISA) starting with the 2012 survey, with the objective of understanding financial literacy levels of high school students around the world.

In this paper, we use the 2012 PISA data to analyze the key factors and determinants of financial literacy among the young in the United States. We use a sample of 1,133 students from 158 high schools in the United States who participated in the 2012 PISA assessment. We find that the average performance of students in the United States is not statistically different from the average of OECD countries (average financial literacy score for the U.S. is 492 and the combined OECD average score is 500). However, we see a large variation in performance in the United States with only about one in ten students scoring in the highest level of financial literacy.

We also find that the main predictor of financial literacy is the socioeconomic status of the student's family. On average, our analysis shows that those who live in households at least one standard deviation richer than the average household have a 33.5 point higher financial literacy score than those in average households. Looking at demographic characteristics of the schools, the only statistically significant predictor of financial literacy is the proportion of math teachers in the

school. In summary, our analysis of the 2012 PISA data helps understand the key determinants of financial literacy among high school students in the United States.

2. Literature Review

Over the past few decades financial literacy has become an increasingly important concept, as research has linked higher financial literacy with better day-to-day financial management skills, higher stock market participation, more precautionary savings, decreased use of high-cost borrowing methods, and higher wealth accumulation (Hilgert, Hogarth, and Beverly 2003; Christelis, Jappelli, and Padula 2010; van Rooij, Lusardi, and Alessie 2011; Yoong 2011; Almenberg and Dreber 2011; Arrondel, Debbich, and Savignac 2012; Lusardi and Tufano 2015; Stango and Zinman 2009, and the review work of Lusardi and Mitchell, 2014).

Several studies have analyzed financial literacy levels among Americans. Findings from these studies suggest that, in general, Americans are poorly informed about basic financial concepts; among them the young and the old are in an acutely fragile situation (Lusardi and Mitchell, 2014). There are also several studies that present evidence that young adults in the United States are particularly vulnerable and have the lower levels of financial literacy than other age groups. For example, using the 1997 National Longitudinal Survey of Youth, Lusardi, Mitchell, and Curto (2010) showed that less than one-third (27%) of young adults possess basic knowledge of interest rates, inflation and risk diversification. They also find that not only is financial illiteracy widespread, but is particularly acute among specific groups including women and those with lower levels of education. Chen and Volpe (2002) found similar results among college students, concluding that females generally have less enthusiasm for, lower confidence in, and less willingness to learn financial topics than compared to men.

In addition, data from the 2008 Jump$tart Coalition Survey of High School Seniors and College Students paint a further troubling picture. Data from the survey show that in 2008, financial literacy levels of high school students had fallen to their lowest levels recorded, with an average financial literacy test score of just 48.3 out of 100. These levels are troubling low, but do increase for college students (average financial literacy score for college students was 62.2 out of 100), and in fact increase between each year of college finished, indicating that a higher education level or more life experience is possibly correlated with a higher level of financial literacy. However these levels are still worryingly low (Mandell, 2008).

Data from the 2012 National Financial Capability Study (NFCS) show that young Americans continue to have low levels of financial literacy. While 85 percent of respondents aged 18 to 34 were confident in their ability to manage day-to-day financial matters, only 38 percent demonstrated basic literacy in economic and financial concepts (de Bassa Scheresberg and Lusardi, 2014). Despite their high level of education, even college-educated young adults are largely unprepared for the financial challenges they face. While they have more assets than other young adults, they tend to be heavily burdened by debt in both the short-term and long-term (de Bassa Scheresberg, Lusardi, and Yakoboski, 2014). These findings highlight the challenges young Americans face and the need for financial education to occur at an early stage.

It is important to note that, while these studies show the young have the lowest levels of financial literacy compared to other age groups in America, this is not the case for all countries. Recent data from the S&P Global Financial Literacy Survey show that in some countries the young are those with the highest level of financial literacy. Specifically, young adults generally have a lower level of financial literacy than middle age respondents in major advanced economies, while young adults have the highest level of financial literacy in major emerging economies (Klapper,

Lusardi, and van Oudheusden, 2015). Thus, it is important to note that the young don't inherently have low levels of financial literacy around the world. As such, it is imperative that we consider the possible determinants of financial literacy among the young in the United States. This paper seeks to add to the literature by analyzing and identifying some key determinants of financial literacy among high school students, using new data from the 2012 PISA financial literacy assessment.

3. Data: The 2012 PISA financial literacy assessment

PISA is a triennial international survey. Since its first wave in 2000, PISA has tested 15-year-old students' skills and knowledge in three key domains: mathematics, reading, and science. The most recent wave of PISA, carried out in 2012, assessed about 510,000 students in 65 economies. In addition to student performance data, PISA collects information about student and school backgrounds through questionnaires that are completed by students, heads of school, and, in some countries, parents. These data help identify the factors that may influence student performance. PISA gauges whether students are prepared for future challenges, whether they can analyze, reason, and communicate effectively, and whether they have the capacity to continue learning throughout their lives. These assessments are conducted to help us understand if students near the end of compulsory education have acquired the knowledge and skills essential for full participation in society. Given these objectives, financial literacy seemed to be a logical addition to PISA.

In 2012, PISA introduced the first optional financial literacy assessment, which became the first large-scale international study to assess youths' financial literacy. A sample of students was selected from the same schools that completed PISA's core assessments in mathematics, reading, and science. As explained later, the PISA financial literacy assessment measures the

proficiency of 15-year-olds in demonstrating and applying financial knowledge and skills.

The optional assessment was conducted in a total of 18 countries and economies.[1] Thirteen are OECD countries and economies: Australia, the Flemish Community of Belgium, the Czech Republic, Estonia, France, Israel, Italy, New Zealand, Poland, the Slovak Republic, Slovenia, Spain, and the United States; five are partner countries and economies: Colombia, Croatia, Latvia, the Russian Federation, and Shanghai-China. Around 29,000 students completed the financial literacy assessment, representing about nine million 15-year-olds in the schools of the 18 participating countries and economies. In addition, parents, principals, and system leaders provided data on school policies, practices, resources, and other institutional factors.

Planning for the 2012 financial literacy assessment began many years before the assessment. In 2010, the OECD put together an expert group to help design the 2012 financial literacy assessment. This expert group represented stakeholders from different countries and included regulators, practitioners, and academics as well as representatives of treasury departments and central banks. They developed the financial literacy assessment over a two-year period, following a methodology whose main features are described below.

The work of the expert group started by defining financial literacy. While many definitions for financial literacy already exist, the challenge was to articulate a definition that holds true across countries and conveys why financial literacy is such a necessary skill:[2]

> *Financial literacy is knowledge and understanding of financial concepts and risks, and the skills, motivation and confidence to apply such knowledge and understanding in order to make effective decisions across a range of financial*

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[1] Note that in some cases the assessment was performed only in a part of the country and did not cover the entire country.
[2] For detail see the Financial Literacy Framework, which was published as a chapter in *PISA 2012 Assessment and Analytical Framework: Mathematics, Reading, Science, Problem Solving and Financial Literacy* (OECD, 2013)

contexts, to improve the financial well-being of individuals and society, and to enable participation in economic life. (OECD, 2014)

There are four innovative aspects of this definition that should be highlighted. First, financial literacy does not refer simply to knowledge and understanding, but also to its purpose— which is to promote effective decision making. Second, the objective of financial literacy is to improve financial well-being, not to affect a single behavior, such as increasing saving or decreasing debt. Third, financial literacy has effects not just for individuals but for society as well. Fourth, financial literacy, like reading, writing, and knowledge of science, enables young people to participate in economic life. As stated in the title of Volume VI of the PISA report, financial literacy is an essential skill for the 21st century.

The assessment was designed to cover three dimensions of financial literacy: content, processes, and contexts. *Content* comprises the areas of knowledge and understanding that are essential for financial literacy. Four content areas were identified: money and transactions, planning and managing finances, risk and reward, and financial landscape. *Processes* describe the approaches and mental strategies that are called upon to negotiate the material. The processes are as follows: identifying financial information, analyzing information in a financial context, evaluating financial issues, and applying financial knowledge and understanding. *Contexts* refer to the situations in which financial knowledge, skills, and understanding are applied, ranging from the personal to the global. Contexts were divided into four groups: education and work, home and family, individual, and societal. Each of these dimensions is described in more detail in Appendix 3. To clarify the importance of financial literacy among high-school students, Table 1 provides

some examples of what being financially literate means for a 15-year-old. Sample questions used to measure financial literacy are provided in Appendix 4.[3]

In addition to student performance data, PISA collected information about student and school backgrounds through questionnaires that were completed by students and heads of schools.[4] The student questionnaire included questions about their education and access to books, money, financial products, attitudes toward economics and finance, confidence in financial matters, and questions on spending and saving behavior (OECD, 2014). The heads of schools answered questions on the characteristics of their school, such as whether financial education is offered in their school, whether it is compulsory or not, who teaches financial education courses, and whether teachers receive specific professional development on the topic (OECD, 2014).

The relative difficulty of test questions was estimated based on the proportion of students answering each question correctly (OECD, 2014). Similarly, the relative proficiency of students was estimated using the proportion of test questions they answered correctly; a highly proficient student will answer more questions correctly than his or her less-proficient peers. The relationship between the difficulty of questions and the proficiency of students was presented on a single continuous scale, which was divided into five levels: Level 1 indicates low proficiency, Level 2 serves as the international baseline proficiency, and Level 5 indicates high proficiency. Students at each level are expected to be proficient at the preceding level. A summary description of the five levels of proficiency in financial literacy can be found in Appendix 5.

In the United States, 158 schools participated in the PISA Financial Literacy Assessment in 2012 and a total of 1,133 students took the assessment, representing a population of 3,524,645

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[3] The exact questions that were used in the assessment were not released by the OECD because they will be used in future waves of the study.

[4] The school and student questionnaires that were used for the United States PISA 2012 assessment can be accessed online at https://nces.ed.gov/surveys/pisa/questionnaire.asp.

students. In Table 2, we summarize the main student demographic, household, and school characteristics of the sample, looking at both test results and information from the background questionnaires. An analysis of these characteristics is provided in the following section.

4. US performance in comparison to other countries

When we compare the US students' performance in financial literacy to the performance of students in other countries, we find that, perhaps surprisingly, US students do not score higher than the OECD average. Figure 1 reports the mean financial literacy scores among the 18 countries-economies that participated in the 2012 PISA financial literacy assessment. The figure documents a large variation in student performance in financial literacy across countries. Colombia is the country with the lowest score (379 points), while Shanghai-China reported the highest score (603). The average score for the OECD countries is 500.

Interestingly, countries with high GDP per capita do not necessarily have more financially literate students (R^2 between financial literacy and GDP per capita is only 0.16, as shown in Figure 2), and many countries with well-developed financial markets, such as the US and many European countries, do not score at the top. These considerations have important implications for policy. First, financial literacy does not seem to be learned simply through "interaction with the financial environment." More complex dynamics are at work. Second, data shows that young adults who live in countries with more developed financial systems often lack the basic financial knowledge to make good financial decisions, even though they may use more sophisticated financial products or will face more personal responsibility for their financial well-being.

The data also document important differences within countries. In the United States, only about one in ten students perform at or above Level 5 (9.4%); this is similar to the average proportion of

students in OECD countries performing at this level (9.7%). In contrast, nearly 18% of students in the United States score below the baseline level (level 2), compared to 15% among OECD countries (Figure 3). These low performers can at best recognize the difference between needs and wants, make simple decisions about everyday spending, recognize the purpose of common financial documents, and apply basic numerical operations in contexts that they are likely to have encountered personally (OECD, 2014). Thus, the financial literacy of this group of students is very low and insufficient to make savvy financial decisions.

5. A deeper look at the US data

An important feature of PISA is that it offers a lot of within-country information to investigate the factors that are associated with better financial literacy scores in a given country. To gain a deeper understanding of the financial literacy of US 15-year-old high school students, we study the relationship between financial literacy and three groups of variables: (1) demographic characteristics of students and their families; (2) socioeconomic status of students' households, and (3) students' school characteristics.

We analyze the data in three ways. First, we provide a descriptive analysis that looks at differences between students at different levels of performance. Second, we report results of a multivariate analysis that looks at the main determinants of financial literacy scores. Finally, we present results of an ordered probit model that looks at how changes in observable characteristics can alter the probability of scoring within a given financial literacy level.

Descriptive Analysis

The descriptive analysis consists of a set of hypothesis testing to understand how the students who perform at Level 1 are different from students at every other level. When the characteristics we are looking at are described as a continuous variable, we perform a mean comparison. When the characteristic is a categorical variable, we perform a proportion comparison. For example, in the case of the socioeconomic index, the null hypothesis is that the average of the index of students at Level 1 is equal to the average index of students at level i. In the case of a categorical variable such as "speaks the language of the test at home," the null hypothesis would be that the proportion of Level 1 students who speak English at home is equal to the proportion of students who speak English at home in level i. We always assume unequal variance among levels.

As a result, the hypothesis testing would be as follows:

$$H_0: \mu_{level\ 1} = \mu_{level\ i(=2,3,4,5)} \text{ or } H_0: p_{level\ 1} = p_{level\ i(=2,3,4,5)}$$

$$H_1: \mu_{level\ 1} \neq \mu_{level\ i(=2,3,4,5)} \text{ or } H_1: p_{level\ 1} \neq p_{level\ i(=2,3,4,5)}$$

We examine a set of characteristics, spanning from demographic characteristics, socioeconomic status and school characteristics.

Appendix 1 provides a summary table of demographics across different levels of performance and reports t-test results. We examine a large set of demographics including age, gender, parents' employment status, language spoken at home, and household composition. In general, we find that gender, parents' employment status, and household composition do not seem to be good predictors of financial literacy scores, as they are not statistically different across different levels of performance. There are two possible explanations for these findings: (1) the

demographic characteristics may not be determinants of financial literacy or (2) the sample size is too small to find statistical differences.[5]

In order to understand more about financial literacy in the US data, including the effect of the small sample size, we explore differences by gender in more detail. In most countries and economies, there are no gender differences seen in the average financial literacy scores among students, but there are differences along the distribution. In the United States girls do not perform (statistically) worse than boys. Moreover, the proportion of boys and girls are not statistically different at any level of financial literacy (Figure 4). In this respect, the United States is different than OECD countries as a whole. In the OECD countries and economies, there are more boys than girls among the lowest and highest performers. In the United States, the proficiency distribution in financial literacy among boys and girls is statistically equivalent. However, it is important to notice that the standard errors calculated with the US sample are considerably larger than the standard errors for the whole OECD sample, as it can be observed in the magnitude of the confidence intervals. Hence, it is possible that there is a difference in performance among boys and girls but the sample size is not large enough to detect it.

The other demographic characteristics of students at different levels of financial literacy are similar in most respects, except language. Familiarity with the language and culture seems to be correlated with the level of financial literacy of the student. For instance, in the highest achievers group (Level 5) the proportion of students who are native (i.e., American with American parents) is 81.8%, while only 66.7% of students in the lowest level of financial literacy are native (Figure 5). A possible explanation for this difference is the language spoken at home. The proportion of students who speak English at home is significantly lower in Level 1 compared to other levels (i.e.,

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[5] A useful discussion regarding this issue can be found in Lipsey (1996).

74.2% in Level 1; 85.8% in Level 2; and 91.1% in Level 5) (Figure 6). Hence, it is possible that some students perform worse on the test because they have a poorer understanding of the meaning of the questions.

The second groups of variables that are analyzed are related to socioeconomic status. We confirm a very strong link between financial literacy and socioeconomic status; in all countries, students who come from higher socioeconomic households score better on the financial literacy assessment. The findings in the United States also show a particularly strong correlation between financial literacy and socioeconomic status. The share of variation in performance explained by socioeconomic status for the US is 17%, which is larger than the OECD average (at 14%).[6]

In PISA, student's socioeconomic status is estimated by the index of economic, social, and cultural status (ESCS), which has been built to be internationally comparable. This index is based on indicators such as parents' education and occupation, the number and type of home possessions (which are used to indicate level of family wealth), and the educational resources available at home. Students are considered socioeconomically advantaged if they are in the top quartile of the index in their country or economy, and socioeconomically disadvantaged if they are in the bottom quartile. The ESCS index is the result of principal component analysis, and it was normalized to have a mean of zero and standard deviation of one (OECD 2014). Therefore, a negative ESCS means that the student is in a disadvantaged position and his or her household has a lower socioeconomic status than the average household in the United States.

The average ESCS score of the top performers (at Level 5) is 0.93 versus the average score among lowest performers (at or below Level 1) of -0.388 (Figure 7). On average, low performers

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[6] OECD. (2014). *PISA 2012 Results: Students and Money (Volume VI): Financial Literacy Skills for the 21st Century*

(Levels 1 and 2) live in households with worse socioeconomic status than the average household in the United States.

Breaking down the index of economic, social, and cultural status, it can be observed that an increase in parents' education is correlated with an increase in student financial literacy score, but the main difference comes from home possessions—in particular, those related to accessing information, i.e., books and a computer at home. Students in the higher literacy levels are more likely to have better and more abundant study resources. In particular, 94% of students in Level 5 have a space to study at home versus 81% in Level 1 (Figure 8); the proportion of students in Level 1 who have access to a computer at home is significantly lower than in every other level (Figure 9). In addition, students who perform better on the financial literacy assessment live in households with more books (Figure 10).

School characteristics are rather similar among the different levels of financial literacy. We do not find significant differences in the proportion of female students, school size, or classroom size. In the median and mean school, 49% of students are girls, and this average is not very different among students in Level 1 and Level 5 (46% and 52% respectively). On average, the population of students of a school that participated in the assessment is 1,389 students, and also in this case we do not find a strong correlation between school population and financial literacy performance. Though there is an extensive economics literature on the positive relationship between class size and performance (Nandrup, 2016; Denny and Oppedisano 2013; Angrist and Lavy; 1999), in our case (and with our small sample) we do not find such an effect for financial literacy. Yet, it is important to notice that the class size of the students is relatively homogeneous. The mean and median class sizes are the same (28 students). Moreover, the top 10% of classes,

ordered by size, have more than 33 students, and the bottom 10% of classes, by size, have fewer than 18.

Multivariate Analysis

The insights into the data become much richer when we use a multivariate regression analysis to investigate the factors associated with differences in student performance. In particular, we study the role of students' characteristics, socioeconomic characteristics, and school characteristics in explaining differences in financial literacy scores. The model we estimate is as follows:

$$Y_i = \beta_0 + Dem_i'\gamma + Z_i'\beta + School_i'\omega + \epsilon_i$$

where Y_i is the financial literacy score, Dem_i' is the vector of demographic characteristics, Z_i' is the vector of socioeconomic characteristics, and $School_i'$ is the vector of school characteristics. The analysis described below was conducted on a sample of 806 US students who took the PISA 2012 assessment and for which no observations are missing for one or more of the variables included in the regression analysis. The estimation strategy is as follows: first, we consider the demographic characteristics, then we add socioeconomic characteristics, and finally we add the school characteristics. In this way, we can assess whether and how much the characteristics of the students matter and, moreover, which set of variables is most important in explaining differences in financial literacy.

To better understand the effects of socioeconomic status, we consider three combinations of the socioeconomic characteristics: (1) the PISA ESCS index; (2) specific components of the ESCS index—highest parental occupational status, highest parental education in years, and the

home possessions index; and (3) simple dummies describing resources available to students, including if the household has a computer, a space for children to study, textbooks, and more than 100 books.

We find that demographic characteristics are not good predictors of the financial literacy score. Overall, demographic characteristics are not significant and in all specifications. However, it is worth noting that being female is negatively correlated with financial literacy score, but this result do not hold for all specification and, in particular, if school characteristics are included. Living in a single parent household is negatively correlated with financial literacy score but this finding does not hold true when controlling for socioeconomic and school characteristics.

The socioeconomic status of the household is an important determinant of the financial literacy score. As mentioned earlier, the socioeconomic status index was standardized to have a mean of zero and standard deviation of one. Roughly speaking, having an ESCS index of one means being one standard deviation richer than the average household (top 84% of the socioeconomics index); a teenager in a family of this socioeconomic status has a financial literacy score 35.5 points higher than a teenager in the mean household. As mentioned above, the socioeconomic status index has three components: highest parental occupational status, highest parental education in years, and home possessions index. A closer look into the components shows that a higher home possessions index and highest parental occupational status are what predicts a better performance on the financial literacy assessment. The home possession index is more important in magnitude than the highest parental occupational status. In particular, having more than a hundred books is correlated with an increase of 42 points on the financial literacy score and having a computer at home is correlated with a 34 point increase on the financial literacy score.

Looking at the school characteristics, the proportion of math teachers in a school is also a determinant of the financial literacy score; an increase of 10% (0.10) in the proportion of math teachers is associated with an increase of 8 points in the financial literacy score.

6. Understanding performance at different proficiency levels

To further understand how these variables impact financial literacy scores, we use an ordered probit to study what impacts the probability of performing at a particular financial literacy proficiency level (there are a total of five). In particular, we look at the estimator that maximizes the likelihood function

$$\left(\prod_{L_i=1}\Phi(c_1 - X_i'\beta)\right)\left(\prod_{L_i=2}(\Phi(c_2 - X_i'\beta) - \Phi(c_1 - X_i'\beta))\right)\left(\prod_{L_i=3}(\Phi(c_3 - X_i'\beta) - \Phi(c_2 - X_i'\beta))\right)$$

$$\left(\prod_{L_i=4}(\Phi(c_4 - X_i'\beta) - \Phi(c_3 - X_i'\beta))\right)\left(\prod_{L_i=5}(1 - \Phi(c_4 - X_i'\beta))\right)$$

where L_i is the level of student i, c_i is the cutoff when the probability switches from one level to the next, and X_i' is the vector of characteristics of the student. In this analysis, we include the same regressors as in the multivariate analysis (that is, demographics, a combination of socioeconomic characteristics, and school characteristics).

The ordered probit estimates are reported in Appendix 2 but the main findings are summarized in Table 4. Analyzing the marginal effect allows us to understand the relationship of student characteristics to the probability of being in a particular financial literacy level. The nonlinear nature of the ordered probit requires evaluating the marginal effect at a particular point. The baseline on which the regressions are estimated is a 15-year-old female student who is an

American with American parents, whose mother and father live in the household and are both employed, and whose family speaks English at home and lives in a city with more than a million people. This household also has high parental occupational status index (57) and high parental education in years (14). This female student has a computer, textbooks, and more than 100 books at home. She goes to a school of about 1,365 students where half of the students are female, the average classroom size is 26, and 14% of the teachers are math teachers.

First, we study how the probability of being at different financial literacy levels would change if this female student were to have fewer than 100 books at home. Her probability of being in Level 1 or 2 would increase to 34.9% and the likelihood of her being in Level 5 would drop by almost half (column (1) and (2) of Table 4).

Second, we investigate how the probability of being at different levels would change for a female student with the same characteristics but without a computer at home. We find that the probability of her being in Level 5 would decrease by 10 percentage points while the probability of her being in Level 1 or 2 would increase by 18 percentage points (column (3) and (4) of Table 4.

Third, we explore how the probability of being in each financial literacy level would change if the proportion of math teacher in the school were to change. Increasing the proportion of math teachers from 14.9% (mean of the sample) to 24.9% creates little changes in the probability of being in each financial literacy level: the probability of being in Level 5 increases by 3.0 percentage points and the probability of being in levels 1 or 2 decreases by 2.7 percentage points.

7. Conclusion

Today's generation of young people face financial decisions in their lifetime which are far more difficult than what previous generations confronted; moreover, these decisions have to be made as early as high school. For instance, high school seniors face the decision of whether or not to go college and how to finance their education. The findings of the 2012 PISA financial literacy assessment of 2012 show that young Americans are not well equipped to make these decisions.

The overall United States performance on financial literacy is similar to the average of OECD countries. Within the United States, there is large variation in performance, with only about one in ten students demonstrating the highest level of proficiency in financial literacy. The main predictor of the financial literacy score is the socioeconomic status of the student. On average, low performers (Levels 1 and 2) live in households with worse socioeconomic status than the average household in the United States. Students who were born into households that are one standard deviation richer than the average household (top 84% of the socio-economic index) have, on average, a financial literacy score that is 35.5 points higher than a teenager in the mean household. The socioeconomic index has three components: highest parental occupational status, highest parental education in years, and home possessions index. A closer look into the components shows that a higher home possessions index and highest parental occupational status are predictor of the better performance on the financial literacy assessment. The home possessions index is more important in magnitude than the highest parental occupational status. In particular, having more than one hundred books generates an increase of 42 points on the financial literacy score and having a computer at home generates a 34-point increase on the financial literacy score.

Furthermore, we find that student demographics are not good predictors of financial literacy scores and the only school characteristic that is significantly correlated with financial literacy performance is the proportion of math teachers in the school. However, it is possible that

the proportion of math teachers in the school is correlated with an unobservable variable of the school that might be correlated with financial literacy performance.

Overall, these findings show that students in more resource-rich families are more likely to perform better on financial literacy assessments. In particular, students with access to information at home through books and a computer are more likely to perform better. Unfortunately, inequality may have effects early in the life cycle and negatively affect financial knowledge, which is rapidly becoming a necessary skill to thrive in today's society.

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Table 1: Examples of what financial literacy might mean for 15-year-olds

Being able to…	For example…
Balance priorities and plan what to spend money on	If they go to the movie theater, will they still have enough money for the bus fare home? Or would it be better to buy pizza and invite friends home?
Remember that some purchases have ongoing costs	A games console will need new games; a motorbike will need fuel, and so on.
Be alert to possible fraud	Some emails that look like they came from their bank might not be legitimate. They should know what to do if they are not sure.
Know what risk is and what insurance is meant for	If their phone gets stolen, they should ask their parents if it is covered by their household insurance.
Make an informed decision about credit	They should know that if they buy a computer on credit, they will have to pay interest on the loan as well as paying the advertised price for the computer, and they should realize that the less they repay of that loan each month, the more they will pay in interest.

Source: OECD. (2014). PISA 2012 Results: Students and Money: Financial Literacy Skills for the 21st Century

Table 2: Descriptive statistics of data from the 2012 US PISA Financial Literacy Assessment

Characteristics	Mean	Standard deviation	Number of valid observations
Students			
Financial literacy score	491.6	99.3	1,133
Proportion of Female students	51.0%	0.5	1,133
Student's age	15.8	0.3	1,133
Proportion of natives (American student with American parents)	77.0%	0.4	1,069
Parents			
Highest Parental Education in years	13.6	2.6	1,112
Proportion whose mother is employed	74.4%	0.4	1,112
Proportion whose father is employed	85.9%	0.3	1,112
Schools			
Class size	26.2	5.3	1,112
Average proportion of math teachers in the school	14.6%	0.1	1,107
Proportion of students in a private school	6.8%	0.3	1,105
Proportion students that live in a rural area (less than 15,000 people)	24.8%	0.4	1,048
Proportion students that live in a town (15,000 to about 100,000 people)	38.4%	0.5	1,096
Proportion students that live in a city (100,000 to about 1,000,000 people)	26.9%	0.4	1,073
Proportion students that live in a city (more 1,000,000 people)	10.0%	0.3	1,112

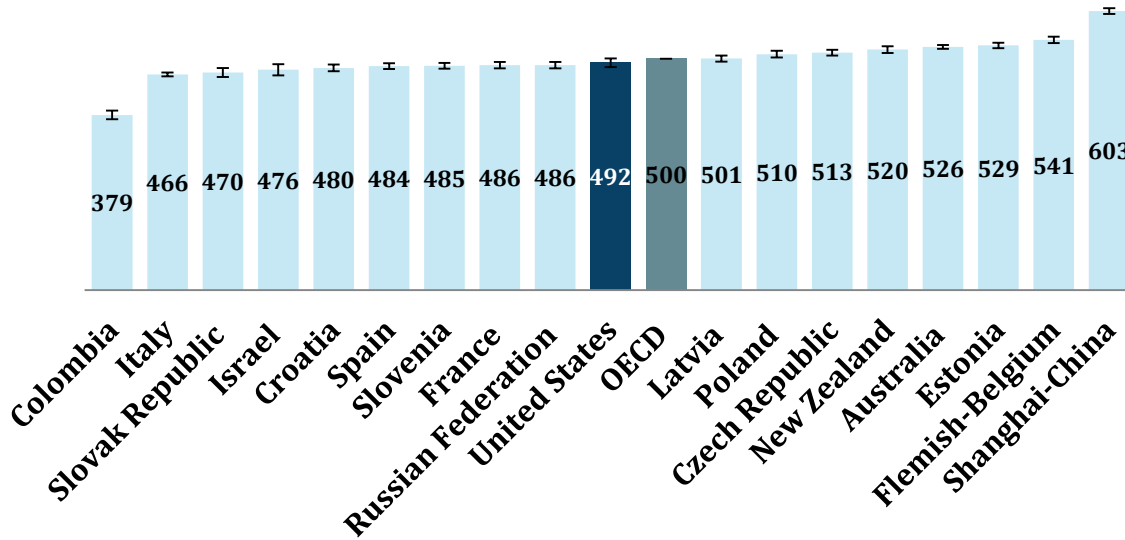**Table 3. Multivariate regressions: financial literacy score**

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Student is 15 years old	-8.905	-8.274	-12.265	-11.498	-11.755	-10.373	-9.474	-9.960
	(8.51)	(8.74)	(8.13)	(8.05)	(7.96)	(7.88)	(7.74)	(7.66)
Female	-8.787	-8.737	-11.264	-12.109	-15.058**	-10.306	-10.983	-14.121*
	(7.92)	(7.81)	(7.57)	(7.70)	(7.40)	(7.43)	(7.46)	(7.53)
Second generation	-22.909	-14.607	-0.394	-2.957	-5.677	-3.570	-6.390	-9.525
	(16.47)	(17.82)	(15.23)	(14.95)	(14.84)	(15.60)	(15.36)	(15.28)
First generation	-11.658	-2.213	13.700	5.847	8.051	12.238	3.737	5.254
	(15.49)	(18.02)	(18.75)	(18.53)	(18.26)	(18.14)	(17.83)	(17.36)
Mother is employed		11.510	-2.333	-3.024	-3.764	-1.767	-2.782	-3.301
		(9.78)	(8.94)	(9.08)	(8.88)	(8.45)	(8.54)	(8.40)
Father is employed		-5.180	-13.273	-11.987	-12.302	-16.168	-14.538	-14.996
		(11.59)	(10.73)	(10.42)	(10.24)	(10.39)	(10.10)	(10.03)
Language of test spoken at home		16.743	6.090	4.630	0.190	8.580	6.656	2.845
		(17.80)	(17.04)	(16.42)	(16.09)	(15.99)	(15.27)	(15.37)
Single parent household		-33.959*	-15.353	-10.728	-15.820	-18.536	-13.807	-18.038
		(19.40)	(16.96)	(16.54)	(16.47)	(17.13)	(16.95)	(16.78)
Employed single mother		-1.540	-1.813	-0.873	-3.144	-0.388	0.813	-2.428
		(22.68)	(19.29)	(19.17)	(19.20)	(19.48)	(19.34)	(19.17)
Socioeconomic status index			37.591***			35.549***		
			(3.98)			(3.65)		
Highest parental occupational status				1.021***	1.029***		0.966***	0.985***
				(0.22)	(0.20)		(0.21)	(0.19)
Highest parental education in years				0.195	0.188		-0.505	-0.391
				(1.98)	(2.06)		(1.85)	(1.90)
Home possessions index				20.873***			21.187***	
				(3.59)			(3.47)	
Have more than 100 books					43.155***			41.872***
					(8.83)			(8.58)
Have a study space					18.406			17.227
					(12.40)			(12.56)
Own a computer					31.795**			33.794**
					(14.71)			(13.98)
Own textbooks					7.163			6.856
					(6.96)			(6.67)
Female enrollment						32.845	25.382	28.601
						(62.06)	(60.32)	(68.74)
Number of students in the school						0.001	-0.001	0.001
						(0.01)	(0.01)	(0.01)
Class size						0.105	0.084	0.152
						(0.87)	(0.87)	(0.90)
Proportion of math teachers						69.339**	84.023***	86.052***
						(28.32)	(28.41)	(30.18)
Town 15,000 to about 100,000 people						20.705	22.840*	19.955
						(13.45)	(13.35)	(13.19)
City 100,000 to about 1,000,000 people						-6.969	-4.739	-5.425
						(16.13)	(15.49)	(15.83)
City more 1,000,000 people						31.746	36.017*	29.643
						(21.88)	(21.35)	(21.97)
Constant	524.453***	508.878***	522.170***	466.867***	416.054***	481.525***	441.472***	383.671***
	(9.28)	(23.68)	(21.81)	(31.19)	(29.92)	(40.00)	(40.30)	(43.39)
N	806	806	806	806	806	806	806	806

$p < 0.10$; ** $p < 0.05$; *** $p < 0.01$ Standard errors in parentheses. Errors clustered at school level.

## Table 4: Probability of being in each level

	Baseline (1)	Have less than 100 books (2)	Do not own a computer (3)	The proportion of math teacher is 10% more than the mean (24.88%) (4)
Probability of being level 1	3.42%	9.31%	7.54%	2.70%
Probability of being level 2	15.28%	25.56%	23.18%	13.31%
Probability of being level 3	28.27%	31.56%	31.42%	26.81%
Probability of being level 4	32.02%	24.00%	26.18%	33.02%
Probability of being level 5	21.01%	9.58%	11.68%	24.16%
Total	**100.00%**	**100.00%**	**100.00%**	**100.00%**

Figure 1: Student performance: Mean financial literacy score by country

379 466 470 476 480 484 485 486 486 492 500 501 510 513 520 526 529 541 603

Colombia Italy Slovak Republic Israel Croatia Spain Slovenia France Russian Federation United States OECD Latvia Poland Czech Republic New Zealand Australia Estonia Flemish-Belgium Shanghai-China

Source: OECD. (2014). *PISA 2012 Results: Students and Money (Volume VI): Financial Literacy Skills for the 21st Century.* Coefficient intervals are constructed at a 5% significant level

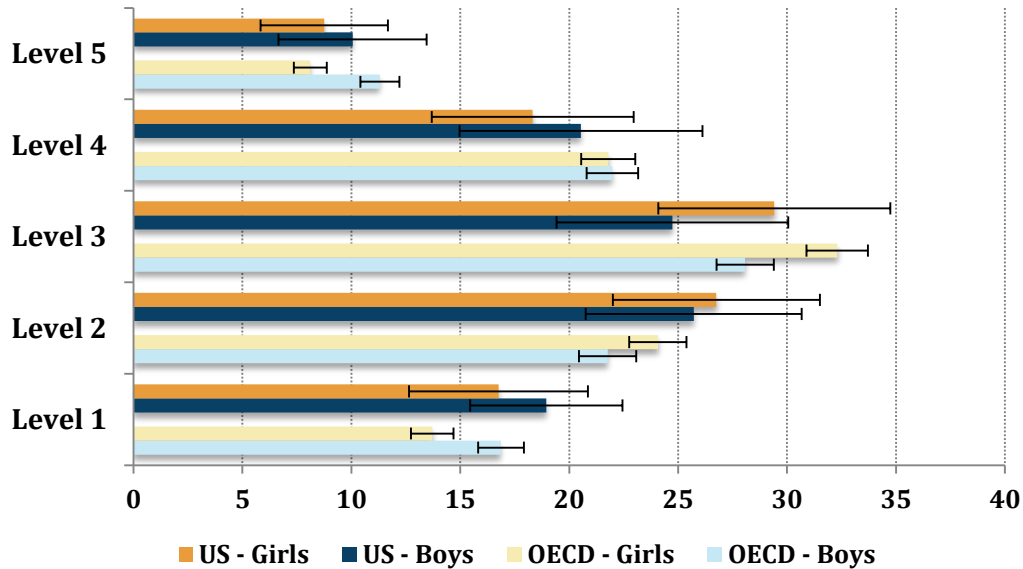**Figure 2: Financial literacy and per capita GDP**
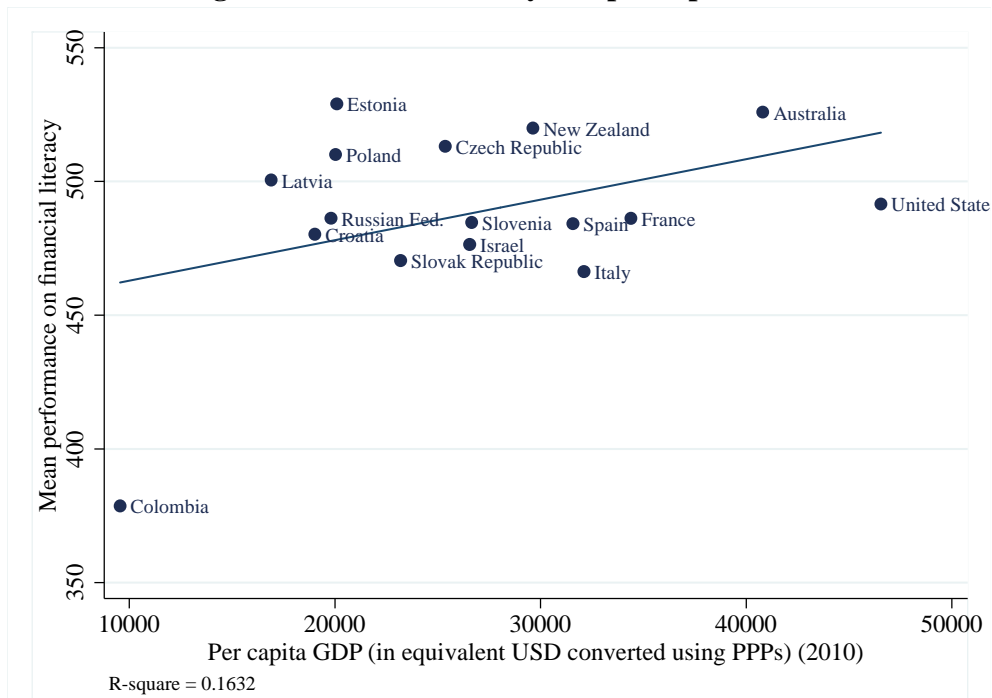
Source: OECD. (2014). *PISA 2012 Results: Students and Money (Volume VI): Financial Literacy Skills for the 21st Century*.

Figure 3: Percentage of students at each level of proficiency in financial literacy
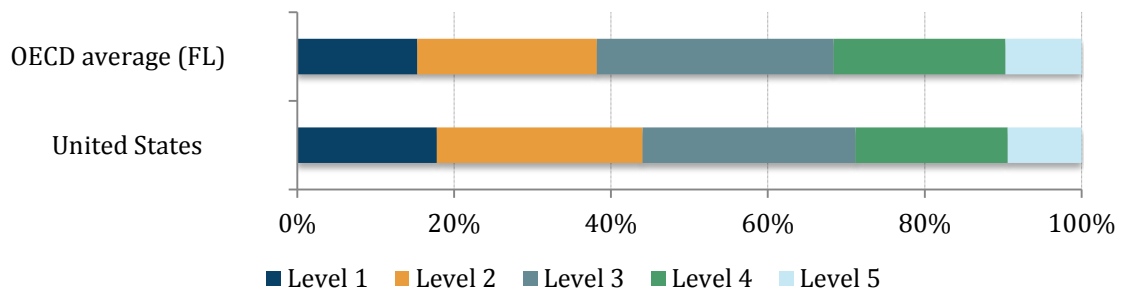
Source: OECD. (2014). *PISA 2012 Results: Students and Money (Volume VI): Financial Literacy Skills for the 21st Century*.

Figure 4: Proficiency in financial literacy among boys and girls, US and OECD

Source: OECD. (2014). *PISA 2012 Results: Students and Money (Volume VI): Financial Literacy Skills for the 21st Century.*
Coefficient intervals are constructed at a 5% significant level
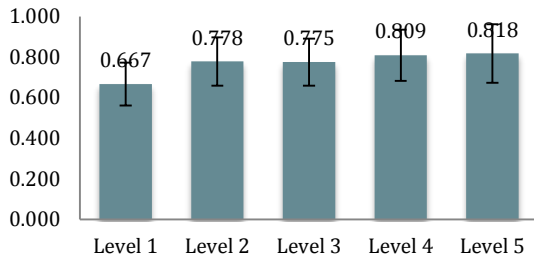
Figure 5: Percentage of native students

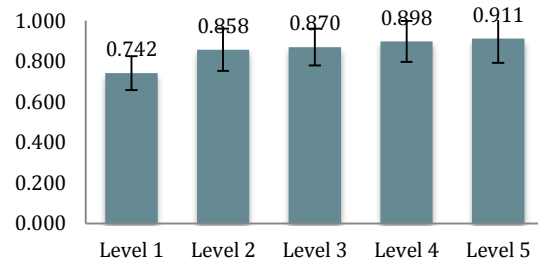**Figure 6: Percentage of students who speak the language of the test at home**

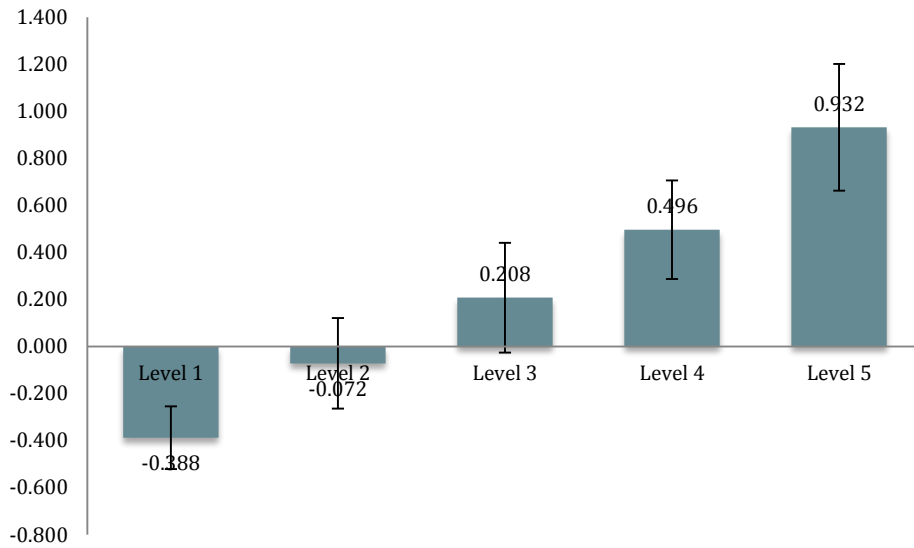**Figure 7: Average index of economic, social, and cultural status**
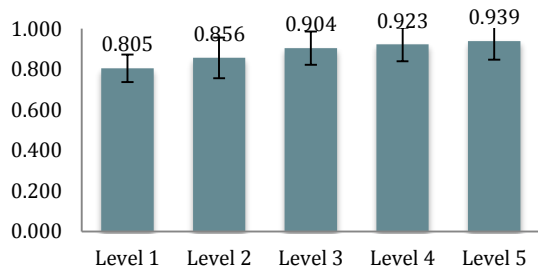
Figure 8: Percentage of students with a study space at home

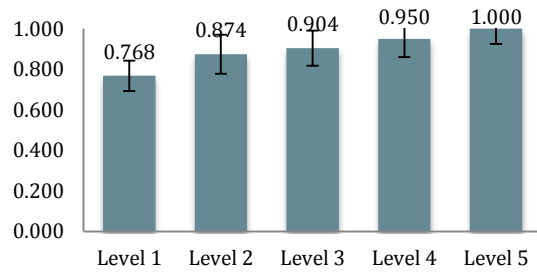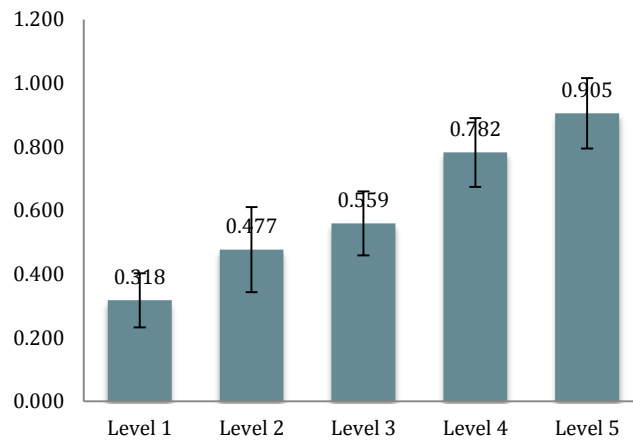**Figure 9: Percentage of students with access to a computer at home**

Figure 10: Percentage of students who have more than 25 books at home

Appendix 1: Hypothesis testing

	Female	American with American parents	Have a study space	Own a computer	Own textbooks	Mother is employed	Father is employed
Diff level 1 and level 2	0.041	0.111*	0.051	0.106**	0.008	0.056	0.033
	(0.06)	(0.06)	(0.05)	(0.05)	(0.05)	(0.06)	(0.06)
Diff level 1 and level 3	0.074	0.109*	0.099**	0.136***	0.059	0.074	0.065
	(0.05)	(0.06)	(0.04)	(0.04)	(0.04)	(0.05)	(0.05)
Diff level 1 and level 4	0.002	0.142**	0.118***	0.181***	0.096*	0.074	0.056
	(0.07)	(0.06)	(0.04)	(0.05)	(0.05)	(0.06)	(0.06)
Diff level 1 and level 5	-0.004	0.151**	0.134***	0.232***	0.135**	0.076	0.039
	(0.07)	(0.07)	(0.05)	(0.04)	(0.05)	(0.06)	(0.06)
Constant	0.479***	0.667***	0.805***	0.768***	0.684***	0.687***	0.817***
	(0.04)	(0.05)	(0.03)	(0.04)	(0.04)	(0.04)	(0.05)

	Highest parental education in years	Language of test spoken at home	Own less than 25 books	Single parent household	Socio-economic status index	Number of students in the school	Female enrollment
Diff level 1 and level 2	0.320	0.116**	-0.159**	-0.056	0.316***	-267.087*	0.014
	(0.27)	(0.05)	(0.07)	(0.06)	(0.10)	(149.49)	(0.01)
Diff level 1 and level 3	0.739**	0.128***	-0.242***	-0.099*	0.595***	-138.524	0.013
	(0.33)	(0.05)	(0.05)	(0.06)	(0.12)	(123.23)	(0.01)
Diff level 1 and level 4	1.270***	0.157***	-0.464***	-0.163***	0.884***	-102.959	0.010
	(0.28)	(0.05)	(0.06)	(0.05)	(0.11)	(159.54)	(0.01)
Diff level 1 and level 5	1.888***	0.170***	-0.587***	-0.135**	1.320***	-21.327	0.017*
	(0.33)	(0.06)	(0.06)	(0.06)	(0.14)	(190.60)	(0.01)
Constant	12.934***	0.742***	0.682***	0.284***	-0.388***	1518.800***	0.481***
	(0.22)	(0.04)	(0.04)	(0.05)	(0.07)	(134.26)	(0.01)

	Class size	Proportion of math teachers	Village less than 3,000 people	Small town 3,000 to about 15,000 people	Town 15,000 to about 100,000 people	Town 15,000 to about 100,000 people	City more 1,000,000 people

Diff level 1 and level 2	-1.415*	0.001	0.075	-0.004	0.019	-0.094	0.003
	(0.76)	(0.00)	(0.07)	(0.04)	(0.05)	(0.06)	(0.03)
Diff level 1 and level 3	-0.692	0.006	0.025	-0.011	0.090	-0.097	-0.007
	(0.66)	(0.01)	(0.04)	(0.05)	(0.07)	(0.07)	(0.03)
Diff level 1 and level 4	-0.507	0.015	-0.011	0.003	0.137*	-0.136*	0.007
	(0.86)	(0.01)	(0.05)	(0.06)	(0.08)	(0.07)	(0.05)
Diff level 1 and level 5	-0.928	0.013	-0.042	-0.043	0.274***	-0.219***	0.030
	(1.05)	(0.01)	(0.05)	(0.06)	(0.10)	(0.08)	(0.07)
Constant	26.900***	0.140***	0.095**	0.140***	0.302***	0.367***	0.096***
	(0.73)	(0.01)	(0.04)	(0.05)	(0.06)	(0.06)	(0.04)

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$ Standard errors in parentheses Errors clustered at school level.

Appendix 2: Ordered probit: Levels of financial literacy

	(1)	(2)	(3)	Baseline
Student is 15-year-old	-0.120	-0.110	-0.114	1
	(0.10)	(0.10)	(0.10)	
Female	-0.112	-0.120	-0.156*	1
	(0.09)	(0.09)	(0.09)	
Second generation	-0.031	-0.063	-0.102	0
	(0.19)	(0.18)	(0.18)	
First generation	0.234	0.138	0.152	0
	(0.24)	(0.23)	(0.23)	
Mother is employed	-0.025	-0.036	-0.044	1
	(0.10)	(0.11)	(0.10)	
Father is employed	-0.187	-0.170	-0.175	1
	(0.14)	(0.14)	(0.14)	
Language of test spoken at home	0.201	0.177	0.128	1
	(0.23)	(0.22)	(0.22)	
Single parent household	-0.154	-0.102	-0.157	0
	(0.18)	(0.19)	(0.18)	
Employed single mother	-0.049	-0.032	-0.066	0
	(0.22)	(0.22)	(0.22)	
Socioeconomic status index	0.418***			
	(0.05)			
Highest parental occupational status		0.012***	0.012***	56.862
		(0.00)	(0.00)	
Highest parental education in years		-0.006	-0.004	13.968
		(0.02)	(0.02)	
Home possessions index		0.250***		
		(0.05)		
Have more than 100 books			0.500***	1
			(0.11)	
Have a study space			0.182	1
			(0.16)	
Own a computer			0.385**	1
			(0.16)	
Own textbooks			0.069	1
			(0.08)	
Town 15,000 to about 100,000 people	0.256	0.284*	0.253	0
	(0.17)	(0.17)	(0.17)	
City 100,000 to about 1,000,000 people	-0.106	-0.082	-0.091	0
	(0.20)	(0.19)	(0.20)	
City more 1,000,000 people	0.386	0.439	0.362	1
	(0.27)	(0.27)	(0.28)	
Female enrollment	0.449	0.367	0.391	0.494
	(0.77)	(0.76)	(0.86)	
Number of students in the school	0.000	0.000	0.000	1365.501
	(0.00)	(0.00)	(0.00)	
Class size	-0.000	-0.000	0.000	26.145
	(0.01)	(0.01)	(0.01)	
Proportion of math teachers	0.831**	1.017***	1.050***	0.149
	(0.38)	(0.38)	(0.41)	
Cut 1	-0.821	-0.347	0.291	
	(0.53)	(0.52)	(0.57)	
Cut 2	0.104	0.585	1.224**	
	(0.54)	(0.52)	(0.56)	
Cut 3	0.907*	1.396***	2.037***	
	(0.52)	(0.51)	(0.56)	
Cut 4	1.768***	2.267***	2.919***	
	(0.53)	(0.52)	(0.57)	
N	806	806	806	

* $p < 0.10$; ** $p < 0.05$; *** $p < 0.01$ Standard errors in parentheses Errors clustered at school level.

Appendix 3: Categories and description of each assessment dimension

Content category	Typical tasks within this category include…
Money and transactions: Includes the awareness of the different forms and purposes of money and handling simple monetary transactions such as everyday payments, spending, value for money, bank cards, checks, bank accounts and currencies.	Asking students to show that they: • recognize bank notes and coins • can identify different ways to pay for items, in person or via the Internet • can check transactions listed on a bank statement
Planning and managing finances: Includes planning and managing of income and wealth over both the short term and long term, and in particular the knowledge and ability to monitor income and expenses, as well as to make use of income and other available resources to enhance financial well-being.	Asking students to show that they: • understand what government taxes and benefits are • can draw up a budget to plan regular spending and saving • understand the impact of compound interest on savings
Risk and reward: Incorporates the ability to identify ways of managing, balancing and covering risks (including through insurance and saving products) and an understanding of the potential for financial gains or losses across a range of financial contexts and products, such as a credit agreement with a variable interest rate, and investment products	Asking for an examination of the potential risks or rewards associated with: • various types of investment and savings vehicles • various forms of credit • market volatility • diversification
Financial landscape: Relates to the character and features of the financial world. It covers knowing the rights and responsibilities of consumers in the financial marketplace and within the general financial environment, and the main implications of financial contracts. It also incorporates an understanding of the consequences of change in economic conditions and public policies, such as changes in interest rates, inflation, taxation or welfare benefits	Assessing whether students: • understand that buyers and sellers have rights and responsibilities • can identify which providers are trustworthy • are aware of the economic climate • understand how the ability to build wealth or access credit depends on economic factors such as interest rates, inflation and credit scores

Processes category	Typical tasks within this category include…
Identify financial information: Applicable when the individual searches and accesses sources of financial information and identifies or recognizes their relevance.	Asking students to show that they: • can identify the features of a purchase invoice • can locate information in a legal contract • can recognize financial terminology, eg. inflation
Analyze information in a financial context: Covers a wide range of cognitive activities undertaken in financial contexts, including interpreting, comparing and contrasting, synthesizing, and extrapolating from information that is provided.	Asking students to show that they: • can compare the terms offered by different mobile phone contracts • can work out whether an advertisement for a loan is likely to include unstated conditions
Evaluate financial issues: Focuses on recognizing or constructing financial justifications and explanations,	Asking students to show that they:

drawing on financial knowledge and understanding applied in specified contexts. It also involves cognitive activities, such as explaining, assessing and generalizing.	• can identify the relative financial merits of making a purchase or deferring it, given specified financial circumstances
Apply financial knowledge and understanding: Focuses on taking effective action in a financial setting by using knowledge of financial products and contexts and understanding of financial concepts.	Asking students to show that they: • can work out whether purchasing power will decline or increase over time when prices are changing at a given rate
Contexts category	**Typical tasks within this category include…**
Education and work: This category is important to 15-year-old students. While many students will continue in education or training at post-compulsory education, some of them may soon move into the labor market or may already be engaged in casual employment outside of school hours.	Scenarios that involve: • understanding payslips • planning to save for tertiary study • investigating the benefits and risks of taking out a student loan • participating in workplace savings schemes
Home and family: Includes financial issues relating to the costs involved in running a household. It is most likely that 15-year-old students will be living with family, but this context category also encompasses households that are not based on family relationships, such as the kind of shared accommodation that young people often use shortly after leaving the family home.	Scenarios that involve: • buying household items or family groceries • keeping records of family spending • making decisions about budgeting and prioritizing spending
Individual: Important within personal finance and especially for students, as most of their financial decisions, including using products such as mobile phones or laptops, are related to themselves and made for their personal benefit, and as many risks and responsibilities must also be borne by individuals. It includes choosing personal products and services as well as contractual issues, such as getting a loan.	Scenarios that involve: • choosing products and services such as clothing, toiletries or haircuts • buying consumer goods such as electronic or sports equipment • opening a bank account
Societal: The core of the financial literacy domain is focused on personal finances, but this context category recognizes that individuals' financial decisions and behaviors can influence and be influenced by the rest of society. It includes matters such as being informed and understanding the rights and responsibilities of financial consumers and understanding the purpose of taxes and local government charges.	Scenarios that involve: • being informed about consumer rights and responsibilities • understanding the purpose of taxes • being aware of business interests • taking into account the role of consumer purchasing power

Source: OECD. (2014). PISA 2012 Results: Students and Money (Volume VI): Financial Literacy Skills for the 21st Century.

The actual questions that were used in the assessment are confidential and were not distributed. PISA questions often refer to situations that take place in the fictional country of Zedland, where the Zed is the unit of currency. This artificial currency has been introduced to enhance comparability across countries and is explained to the students before the test begins.

Example 1: INVOICE
(Level 1)
Sarah receives this invoice in the mail

Breezy Clothing

Invoice
Invoice Number: 2034
Date issued: 28 February

Sarah Johanson
29 Worthill Rd
Kensington
Zedland 3122

Breezy Clothing
498 Marple Lane
Brightwell
Zedland 2090

Product code	Description	Quantity	Unit cost	Total (excluding tax)
T011	T-shirt	3	20	60 zeds
J023	jeans	1	60	60 zeds
S002	scarf	1	10	10 zeds

Total Excluding Tax: 130 zeds
Tax 10%: 13 zeds
Postage: 10 zeds
Total Including Tax: 153 zeds
Already Paid: 0 zeds

Total due: 153 zeds
Date due: 31 March

Question
Why was this invoice sent to Sarah?

A. Because Sarah needs to pay the money to Breezy Clothing.
B. Because Breezy Clothing needs to pay the money to Sarah.
C. Because Sarah has paid the money to Breezy Clothing.
D. Because Breezy Clothing has paid the money to Sarah.

Correct answer: (A) – Because Sarah needs to pay the money to Breezy Clothing.

Nature of the task: Recognise the purpose of an invoice. Calculations are not required in this item.

Content: *money and transactions*
Process: *identify financial information*
Context: *individual*

Example 2: NEW OFFER
(Level 5)

Mrs Jones has a loan of 8000 zeds with FirstZed Finance. The annual interest rate on the loan is 15%. Her repayments each month are 150 zeds.

After one year Mrs Jones still owes 7400 zeds.

Another finance company called Zedbest will give Mrs Jones a loan of 10 000 zeds with an annual interest rate of 13%. Her repayments each month would also be 150 zeds.

Question

If she takes the Zedbest loan, Mrs Jones will immediately pay off her existing loan.
What are two other **financial** benefits for Mrs Jones if she takes the Zedbest loan?

1.   ………………………………
2.   ………………………………

Correct answer: She will be paying a lower interest rate AND She will have more money available

Nature of the task: Recognize positive consequences of transferring a loan to a lower interest rate. Calculations are not required in this item. Note that the following question – not reported in this online example – asks students about the possible disadvantages of taking the Zedbest loan.
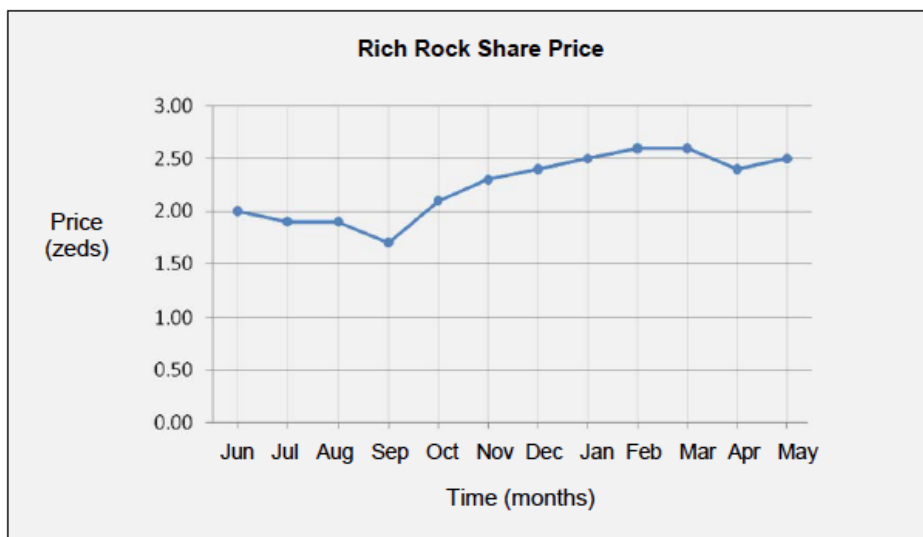
Content: *planning and managing finances*
Process: *analyze information in a financial context*
Context: *individual*

Example 3: SHARES
(Level 3)

This graph shows the price of one Rich Rock share over a 12-month period.

Question

Which statements about the graph are true?

Statement	Is the statement true or false?
The best month to buy the shares was September.	True / False
The share price increased by about 50% over the year.	True / False

Correct answer: Only the first statement is true

Nature of the task: Analyze information in a financial context by considering the information in a line graph about an investment product. The graph shows how the price of shares has changed over a year. The first part of the question assesses a student's understanding that shares should be bought when the price is low. The second part of the question assesses whether students can correctly identify the increase in share prices and calculate the percentage change over time.

Content: *risk and reward*
Process: *analyze information in a financial context*
Context: *individual*

Appendix 5: Five levels of proficiency in financial literacy

Level	Score range	% of students able to perform tasks at each level or above (OECD average)	What students can typically do
1	326 to less than 400 points	95.2%	Students can identify common financial products and terms and interpret information relating to basic financial concepts. They can recognize the difference between needs and wants and can make simple decisions on everyday spending. They can recognize the purpose of everyday financial documents such as an invoice and apply single and basic numerical operations (addition, subtraction or multiplication) in financial contexts that they are likely to have experienced personally.
2 Baseline	400 to less than 475 points	84.7%	Students begin to apply their knowledge of common financial products and commonly used financial terms and concepts. They can use given information to make financial decisions in contexts that are immediately relevant to them. They can recognize the value of a simple budget and can interpret prominent features of everyday financial documents. They can apply single basic numerical operations, including division, to answer financial questions. They show an understanding of the relationships between different financial elements, such as the amount of use and the costs incurred.
3	475 to less than 550 points	61.8%	Students can apply their understanding of commonly used financial concepts, terms and products to situations that are relevant to them. They begin to consider the consequences of financial decisions and they can make simple financial plans in familiar contexts. They can make straightforward interpretations of a range of financial documents and can apply a range of basic numerical operations, including calculating percentages. They can choose the numerical operations needed to solve routine problems in relatively common financial literacy contexts, such as budget calculations.
4	550 to 625 points	31.6%	Students can apply their understanding of less common financial concepts and terms to contexts that will be relevant to them as they move towards adulthood, such as bank account management and compound interest in saving products. They can interpret and evaluate a range of detailed financial documents, such as bank statements, and explain the functions of less commonly used financial products. They can make financial decisions taking into account longer-term consequences, such as understanding the overall cost implication of paying back a loan over a longer period, and they can solve routine problems in less common financial contexts.
5	Equal to or higher than 625 points	9.7%	Students can apply their understanding of a wide range of financial terms and concepts to contexts that may only become relevant to their lives in the long-term. They can analyze complex financial products and can take into account features of financial documents that are significant but unstated or not immediately evident, such as transaction costs. They can work with a high level of accuracy and solve non-routine financial problems, and they can describe the potential outcomes of financial decisions, showing an understanding of the wider financial landscape, such as income tax.

Source: OECD. (2014). PISA 2012 Results: Students and Money (Volume VI): Financial Literacy Skills for the 21st Century.