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FINANCIAL LITERACY AND THE EFFECTS OF THE GREAT RECESSION ON HOUSEHOLD DISPOSABLE INCOME IN SPAIN AND IN THE EUROPEAN UNION

Bachelor's Thesis

Supervisor: Visiting Lecturer Simona Ferraro

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I declare I have written the bachelor's thesis independently.
All works and major viewpoints of the other authors, data from other sources of literature and elsewhere used for writing this paper have been referenced.

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ABSTRACT

This thesis analyses how the household disposable income is correlated with the level of financial literacy amongst adults in countries within the European Union before, during and after the Great Recession, that took place between 2008 and 2014. The research is inspired by the devastating economic effects of the financial crisis in Spain, especially regarding the unemployment rate in the country.

To understand what happened in Spain and in the European Union, linear regression analyses are performed for each year from 2006 to 2014, using the dataset from the Organisation for Co-operation and Economic Development (OECD) for the household disposable income and from the Standard and Poor's for the level of financial literacy amongst adults. Making use of empirical evidence, is provided that during 2006 to 2008, period that anticipated the collapse of the crisis, the level of financial literacy had a very weak negative correlation with the household disposable income, whilst from 2009 to 2014 only positive correlations were found.

During the roughest years of the financial recession, 2011-2012, results show the strongest positive linear correlation amongst all regression outputs, suggesting that when an economic recession is at its worst, the households' financial literacy skills tend to have more relevance on their disposable income. Additionally, results show that the Programme for International Student Assessment (PISA) 2012 results in financial literacy have a strong correlation with the Standard and Poor's Global Financial Literacy Survey index amongst adults, implying that the younger generations are not more financially educated than their parents', which raises more concerns regarding the future of financial education.

Keywords: Financial literacy, household disposable income, financial education, great recession, household finance, financial management, Spain, European Union.

INTRODUCTION

With a fast-pacing world that constantly keeps offering brand new sets of financial products and services to the public, it is essential that the average citizen is able to make wise and well-thought decisions when it comes to its own personal finances. Well-informed citizens not only increase their own wealth, but also contribute in improving the overall economy of a nation (Berger, Noah and Fisher, Peter 2013).

Educated citizens also make good entrepreneurs, as they have better managerial skills that may help them to achieve their goals when it comes to planning on a budget. There is no doubt that to invest in education is also to invest on the wealth of a society. However, when it comes to financial education, the debate is still in a very early stage, both in research and in its practical implementation. (ACCA 2014).

The Great Recession that took place between the years of 2008 and 2014 brought up numerous drawbacks to the global economy, although some countries suffered worse effects of the financial crisis than others. In the European Union, the recession had significant impacts, though some countries such as Spain, Portugal, Italy and Greece were severely affected with high unemployment rates and a great fall on the standard of living of the population (Pissarides, Christopher A. 2013). The situation in Spain was the chosen one to be brought up to the highlights of this paper, as they were one of these countries that suffered the toughest consequences of the crisis.

The research questions that are studied is how a population which is financially literate or illiterate deal with the economical downsides of a recession when it hits their homes. This thesis aims to answer to what extent the level of financial literacy of these individuals had a correlation with the household disposable income in the selected countries within the European Union during, before and after the Great Recession, as well as how is the level of financial literacy amongst youth correlated with the level of financial literacy amongst the adults.

The objective of this thesis is to evaluate the impact of the knowledge in basic financial terms by individuals on their household finances, and to develop on measures to improve further research and the issues of the current dataset and researches available.

The hypotheses brought up in this thesis are whether financial literacy amongst adults has a positive correlation with the variation in the annual growth rate of the household

disposable income or not. The method used to achieve the goal of the study is by adopting a quantitative approach, specifically by making analyses of the outputs acquired through linear regressions between the years of 2006 and 2014.

In the first chapter of this thesis, a theoretical overview on the main literature that approached the history of the Great Recession is made, exploring its origins and impact in Spain and in the European Union. The chapter follows with an overview of the human capital theory as defined by Adam Smith (1817) and how education and unemployment relate to it according to other researches. The chapter ends with a summary of the relevance of financial literacy, how it can benefit the households and what initiatives have been taken so far.

In the second chapter, it is explored the methodological approach of the research and the dataset is introduced. The research questions are discussed and the setting of the dataset presented. The research design explores the reasons why the datasets from the OECD were chosen for this thesis, and the strategy and measurement of the study is also briefly explained.

In the third chapter, the analysis and results of the thesis are examined, after having acquired enough background knowledge on the motivations to explore the topic from the theoretical overview and the methodological approach. The analyses are separated according to the stages of the Great Recession, being divided as the period pre-crisis which comprises the timeframe of 2006 to 2008, the peak of the recession between 2009 and 2012, and finally the last stage of the recession from 2013 to 2014 during its recovery. They are divided in order to comprehend the effects of the level of financial literacy amongst adults in every single stage of the financial crisis.

Afterwards, this thesis explores the PISA results in financial literacy amongst the 15-year-old globally and how it correlates with the results acquired from the Standard and Poor's Global Financial Literacy Survey index amongst adults, aiming to find whether there is an improvement in the financial literacy skills when comparing the older with the younger generations.

In the last chapter, the results and summarised and general conclusions are made pointing an answer to whether financial literacy and the household disposable income are correlated or not.

1. THEORETICAL OVERVIEW

This theoretical overview explores the historical background of the Great Recession and its impacts in the economies of Spain and the European Union, by briefly discussing the situation before, during and after the crisis. Afterwards, it sightsees the human capital theory as defined by Adam Smith (1817) and what is the relevance of education in it, as well as a short overview on the unemployment rates and its correlation with the average of the quality of education received by the population based on the OECD and PISA data. The definition of financial literacy is also explored amongst the current activities being carried on by private and public institutions to support financial awareness.

1.1. Literature overview

Several researchers have documented the history of the Great Recession in the United States of America and its subsequent spread to the rest of the world, and they have emphasised its origins and effects on the global economy (Markham, Jerry W. 2015; Rubin, Jeff 2008; Plumberg, Kevin and Johnson, Steven 2008; Temin, Peter 2010). Weisbrod (1962) explored a modern theory of human capital, whilst Mincer (1984) and Becker (1967) defended that the knowledge attained by individuals should be considered as a form of human capital and how it affects the distribution of income.

Mason and Wilson (2000) and Worthington (2006) have stressed how the programmes for the development of financial literacy were important to develop a well-rounded skilled citizen. In his study, Clark *et al.* (2006) has explored the relevance of the pensions in the United States and their planning, and Nieri (2007) has performed studies and surveys in Spain mainly to find out the level of financial literacy in the country and the correlation with the level of Spanish's households disposable income.

1.2. The Great Recession and its impact in Spain

The Great Recession was the global financial crisis that took place between the years ºof 2008 and 2014, whereas it showed its effects in Spain in an extended period from 2008 to 2016. In order to understand its origin, a short introduction of it is necessary such as the real estate bubble in the United States in the 2000s. Around 2002, the United States softened their markets and lowered their interests and taxes, activity which normally resulted a subprime lending. Every time there is a subprime lending, it is natural that a new real estate bubble will arise, as the excess of credit encourages people to buy (Markham, Jerry W. 2015).

Between 1980 and 2000, the raw materials became cheap in the United States provoking an increase in consumption and production for the industry. However, after 2008, the price of the oil and raw materials increased and it compromised many economies on a global scale, as a persistent high inflation was walking alongside high unemployment rates causing a recession in these economies as they adopted tighter monetary policies that did not seek to reduce the inflation rates. (Rubin, Jeff 2008).

The beginning of the Great Recession was pronounced when some of the most influent investment banks in the United States such as the American Home Mortgage and Bear Stearns bankrupted by the end of 2007, and culminating with the bankruptcy of Lehman Brothers in 2008. The first signal that the financial crisis had arrived in Europe was flagged by the German bank IKB which has requested a rescue from public entities to avoid its bankruptcy.

As the stock exchanges collapsed all around the world and the French bank BNP Paribas announced the suspension of some of its funds shortly after due to the lack of liquidity, other European banks decided to inject money back into the market to control the situation. Nevertheless, despite the attempt of the former president of the United States, George W. Bush to assure that there was enough liquidity in the markets, the European Central Bank suspected that it was just the beginning of a financial recession.

By 2008, the price of metals such as copper, as well as the oil, sulfuric acid and sodium hydroxide, which all are key raw materials in the industry, suffered historical price spikes followed by a sudden drop provoking high levels of volatility which was felt by developed countries all around the world. According to Reuters (2008), during the year of 2008 the inflation spiked up to historic levels all around the world (Plumberg, Kevin and Johnson, Steven 2008), whilst the International Monetary Fund (2008) warned that the

inflation was at its highest in countries reliant on the exportation of oil due to the increase of the reserves of foreign exchange, as well as in underdeveloped countries that were facing the same issue.

The European Central Bank took too long to take the first measures to contain the financial crisis, and its austere measures summed with the holding of the public expenses that dramatically diminished the credit made it difficult for the industry and the consumers to have access to it. Some European countries quickly felt the impacts, for instance Denmark that entered a recession and had six consecutive months of economic decline during the first quarter of 2008 (WSWS 2008). During the second quarter of the same year, France and Germany, as being two of the largest countries in the European Union, also had negative results that helped to drag the whole European Union's economy down by 0.2 per cent (Spiegel Online 2008). In the meanwhile, Spain's economy managed to avoid negative results but they did not manage to have a considerable growth either, and on top of that it had its unemployment rate in a steep increase, as indicated by the Figure 1.

During the third quarter of 2008, however, Spain officially entered in an economic recession, which only aggravated the already tough situation regarding the unemployment rates in the country (Day, Paul 2009).

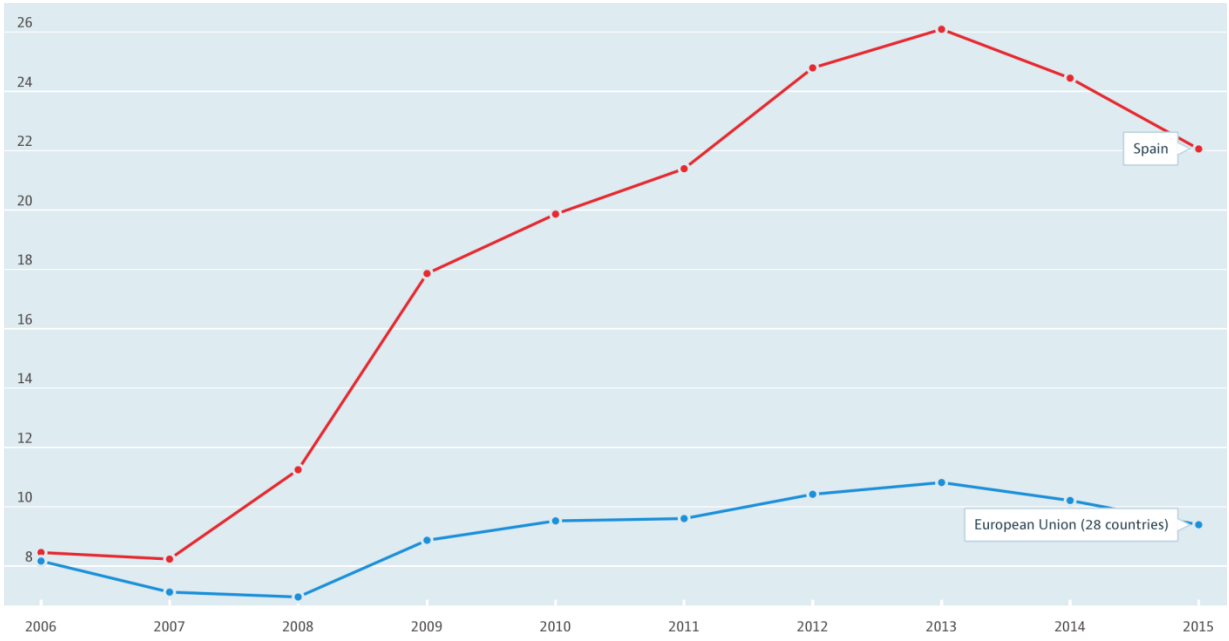

Figure 1. Unemployment rate in Spain and the European Union from 2006 to 2015 as the total percentage of the labour force

Source: (OECD 2017)

The unemployment rate in Spain had a steep increase from the year of 2007 until the year of 2013, having slowly recovered since then. During 2008, several major companies had mass layoffs in Spain due to their rough financial situation. One of the sectors that suffered the most from the recession was the construction, as the real estate euphoria had ended so as the sales of real estate properties. The market had up to five times more properties than what it was demanded, resulting in construction companies defaulting on their debts as they were not able to generate a return from their investments, also causing more layoffs to add to the unemployed rates. (Chislett, William 2014; Eavis, Peter 2016).

It is widely discussed the reasons why the unemployment rates in Spain increased much more than in the rest of Europe, and the most accepted explanations are the increase in the number of inhabitants in a working age and the excess of labour rights, which makes it harder for the employers to sustain all taxes and benefits for their employees in the event of an economic crisis (Bentolila *et al.* 2011). Other particularities in Spain were the high salaries of the managers combined with the inefficiency of the Eurozone regulatory organisations. In 2009, many people and companies defaulted on their debts, which alongside with the poor management of some banks forced the government to intervene to rescue them, otherwise they would have had to declare bankruptcy.

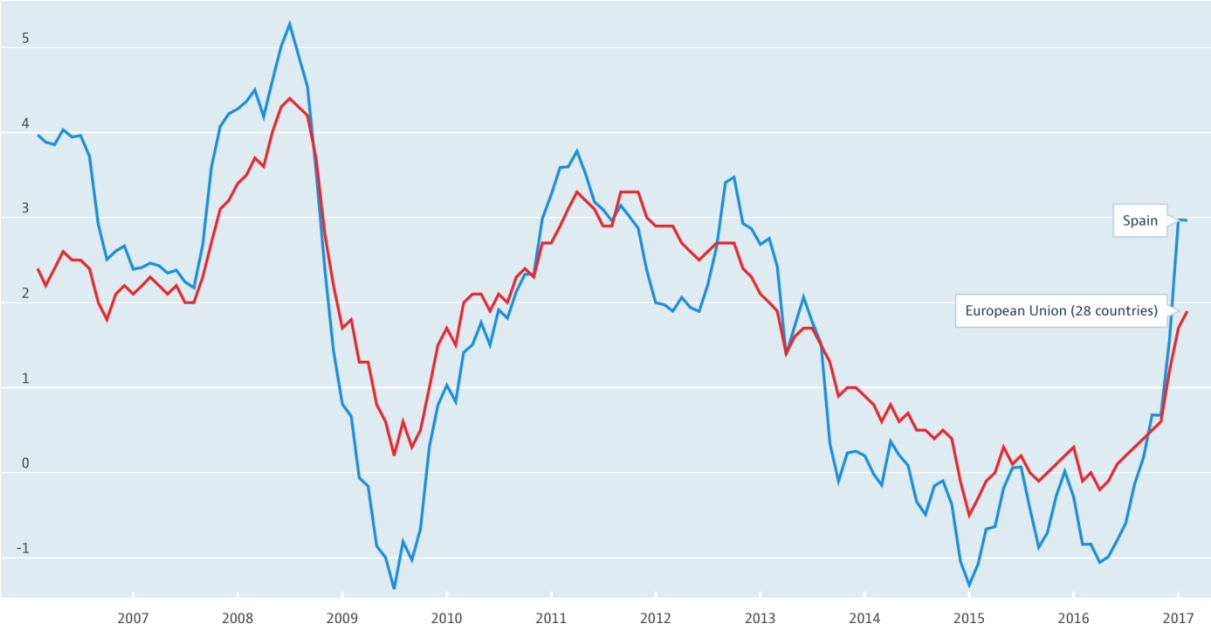

Figure 2. Inflation rate in Spain and the European Union from 2006 to 2017 as the total annual growth rate, in per cent

Source: (OECD 2017)

The year of 2009 came with an opposite situation: a deflation. The Federal Reserve System (the United States of America's Central Bank) had to lower its interests to almost 0 per cent, and during that year the world had a historic mark of 205 million unemployed people (The Wall Street Journal, 2008). Even though Central Banks all around the world made their efforts, they did not help much the economic situation because most of the injected money was led to savings and not to spending. By the end of 2012, Spain had an unemployment rate of 26 per cent of the active labour force with approximately 6,200,000 unemployed people, and its gross domestic product kept falling (Giles, Ciaran 2013). Between 2012 and 2013 alone, the Spanish social security lost almost 800,000 workers. From 2013 onwards the unemployment rate started to slowly decrease, however by 2016 it was still at higher rates than in 2011 (Instituto Nacional de Estadística 2017).

One of the main reasons was that the country was seriously affected by the financial crisis when compared to the average of the other European countries, because of an excessive amount of risks taken by the banks and laxity of the financial regulators. People who were in charge of the big institutions decided to ignore the warnings of the official institutions, such as the ones made by the European Central Bank, and heavily failed on taking the right administrative measures in order to reduce the risks of their actions in their institutions. (Chan, Sewell 2011).

1.3. The human capital theory, education and unemployment

Capital is not only defined by tangible assets as other intangible factors have an influence on the productivity of a person, which consequently raises earnings and increases other assets on the course of a person's life (Conlon *et al.* 2012). It is truthful to say that the accumulation of qualities can be treated as human capital, such as skills and knowledge that one person possesses, and that they can be defined as a form of wealth. One of these intangible assets is the educational level of a person, which contributed to the human capital become a fundamental variable for the economic performance. This discussion has started in the 18th century when Adam Smith (1817) proposed that not only technical assets should be evaluated when analysing the performance of an enterprise, but also the human. During the 1950s a modern theory of human capital emerged as economists started being concerned on how to improve the quality of the work force as the economic grew, suggesting that outgoings

on education should be treated as a very important investment in human capital (Weisbrod, Burton A. 1962).

Mincer (1984) and Becker (1967) have worked on the relationship between the human capital as knowledge and aptitudes and the distribution of income, suggesting that labourers make their investment choices having in mind their potential for a growth in their income in the future, and they have emphasised the relevance of education as one of these investments with a high level of return of investment in the human capital as it would give these workers more job opportunities in future and a reduction of poverty (Garrido Trejo, Cassandra 2007).

Most of the studies that have been made in the field, have found a positive correlation between education and human capital (Griliches, Zvi 1997). However the few ones that found a negative correlation turned out to be due to the methodology used in these studies that have focused on the quantity of the education received by the people and not based on its quality (Capocasale Bruno, Alejandra 2000). When analysing the quantity, it is observed the amount of years spent in school a person had, an easily obtainable data from statistical institutions.

It is very complicated to measure the quality of these studies if a specific target, such as particular subject during these years of study, is not aimed whilst researching. As an example, on how years of schooling do not translate to quality, it is safe to say that, on average, the quality received in the studies in an underdeveloped country will be of inferior quality than the one received in Northern European countries, for instance.

One organisation that aims to thoroughly measure the quality of education is the OECD with its Programme for International Student Assessment (PISA), whose applies standardised examinations of math, sciences and reading every three years on 15-year old pupils from all OECD countries (see Appendix 1 for the full results from the latest PISA 2015's study). The examination focuses on problem solving and cognitive abilities, using them as a tool to measure and rank the quality of education in the countries it has been applied (PISA 2015).

It is needed to have a measure of the quantity of human capital in a country and it should always be priority to have a focus on quality of education rather than quantity. Nonetheless, the level of education does not eliminate the issue of unemployment. Even though investments in educations are made, it does not assure that the worker will be protected against being eventually unemployed.

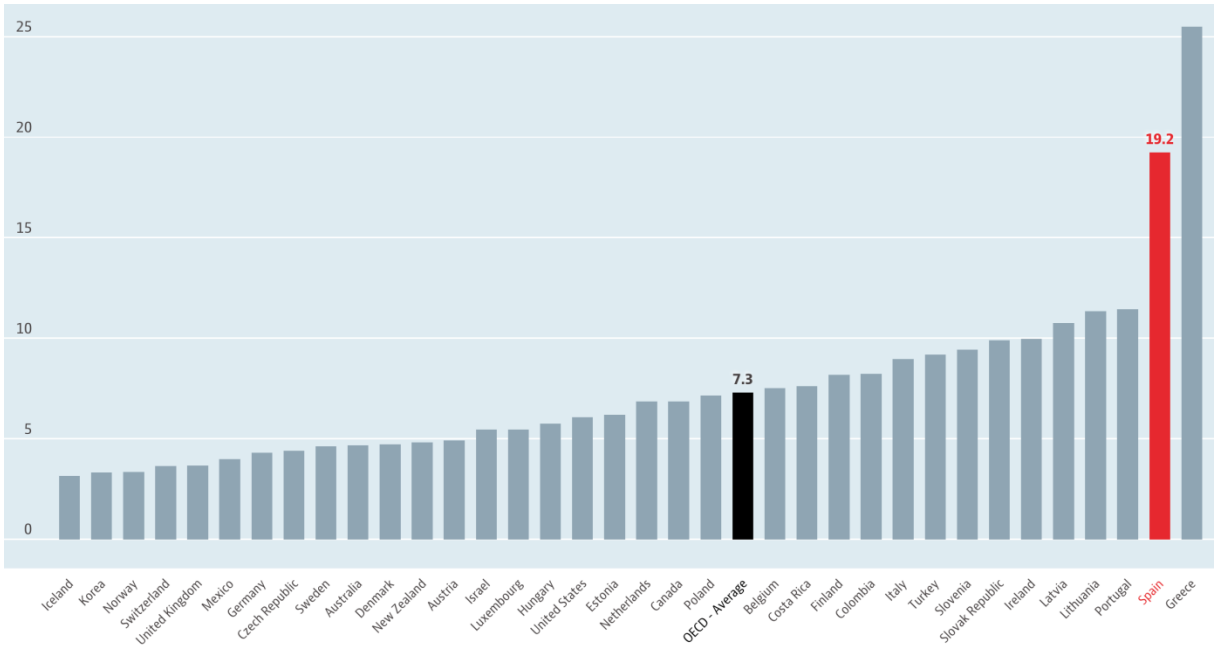

Figure 3. Unemployment rates by upper secondary non-tertiary education level, as the percentage of individuals between 25 and 64 years old in OECD countries studied in 2015
Source: (OECD 2017)

For instance, the OECD performs reports on the unemployment rates according to the level of education of the citizens, divided between below upper secondary, upper secondary non-tertiary and tertiary education (OECD, 2017). Whilst analysing the results for the unemployment rate amongst citizens with upper secondary non-tertiary education, the top 5 countries with the highest rates are Greece, Spain, Portugal, Lithuania and Latvia, whilst the 5 countries with the lowest rates are the United Kingdom, Switzerland, Norway, Korea and Iceland.

The upper secondary non-tertiary education level, which is normally labour-oriented with the option of a vocational qualification, represents the education acquired after the compulsory secondary education and it stands under the tertiary educational level, which is the equivalent of a bachelor's degree. These statistics suggest that even citizens who were formally prepared for the job market in vocational studies suffered with the high rates of unemployment amongst them.

Table 1. Unemployment rates versus PISA results in 2015

Country	Unemployment rate, %	PISA – science	PISA – reading	PISA - mathematics
OECD average	7.3	493	493	490
Greece	25.5	455	467	454
Spain	19.2	493	496	486
Portugal	11.4	501	498	492
Lithuania	11.3	475	472	478
Latvia	10.7	490	488	482
Ireland	9.9	503	521	504
Mexico	4.0	416	423	408
United Kingdom	3.6	509	498	492
Switzerland	3.6	506	492	521
Norway	3.3	498	513	502
Korea	3.3	516	517	524
Iceland	3.1	473	482	488

Source: (Compiled by the author based on the data provided by the OECD 2017)

Notes: PISA score are expressed in points

The Table 1 shows the correlation between the unemployment rate amongst individuals with upper secondary non-tertiary education and the latest results of the PISA 2015. It is possible to observe that Portugal and Spain have PISA results above the OECD average and they are the two countries in the world with the highest unemployment rates amongst the percentage of citizens who completed the upper secondary non-tertiary level of education. Ireland is also a country that ranked considerably high on the PISA assessment and scores a high percentage of unemployment rate. On the other hand, the country with the lowest unemployment rate such as Iceland has PISA scores below the OECD average. Another representative example is Mexico with PISA results below the average yet it ranks amongst the countries with the lowest unemployment rates.

The investment in education is certainly important, however it is safe to say that the quality of education received is not directly correlated with the unemployment rate.

Therefore, a question lies ahead: where is the education system failing in preventing that people will suffer impacts due to the poverty that unemployment causes?

1.4. Financial literacy and its relevance

Noctor, Stoney and Stradling (1992) defined financial literacy as the ability of understanding the management of money. It is roughly how people manage to learn the functionality of financial products and how they function, as well as the risks involved in their decisions so they can make better choices in everything that relates to their personal finances. The financial education aims to develop the methods of teaching citizens on how to adequately choose the financial products and take the right decisions in order to successfully achieve their future objectives. This kind of education is achieved since the childhood, which is when the human being learns more easily, especially unconsciously, therefore it is important that healthy financial habits are introduced from an early age. (Grohmann, Antonia; Kouwenberg, Roy and Menkhoff, Lukas 2015).

The researchers Mason and Wilson (2000) have supported that programmes for the development of financial literacy encourage the development of different areas on people such as an overall better critical thinking not only on their personal finances but also in other aspects of their lives. Volpe, Chen and Liu (2006) have defended that these programmes should focus mainly on retirement plans and basic investment theory as people lack in knowledge of these two crucial areas. In fact, Bernheim and Garrett (2003) have revealed in their studies that some North American companies implemented financial education programmes during the 1980s and they actually motivated workers to invest in private retirement plans.

A good knowledge in personal finances management helps an individual to understand the economic environment better and how it affects his or her family at home (Worthington, Andrew C. 2006). Clark et al (2006) have supported this belief by defending that people tend to be more reliant on themselves to guarantee their future pensions, hence they need a better knowledge in personal finances management to ensure that they will succeed.

Nevertheless, despite the continuous growth of elder people in almost every developed country, there are few programmes focussed on the financial literacy attainment. Simple ways to introduce financial education to the general population of a country would include

informative websites, booklets and flyers approaching subjects such as insurances, investments, retirement plans and banking vocabulary. Although being a relatively cheap measure to implement, very few governments have shown proactivity in implementing it.

Besides providing benefits to individuals, Braunstein and Welch (2002) have endorsed that financial education also benefits the development of the financial markets since the more educated citizens encourage the offer of better services with a wider range of options, creating a more efficient and competitive market to suffice the new demand.

The OECD (2005) defends that everyone could benefit from having a higher financial literacy, regardless of their income. For instance, young people just entering the job market, a better financial education can help them to organise a reliable savings account to keep their debts up to date. Families that have the habit of saving will have better conditions to finance the studies of their children and a more comfortable life, and elders will benefit by having a decent savings account or returns made by safe investment choices by the time they decide to get retired.

Few countries have been introducing financial education as a curricular subject in schools. In the United States, the subject is already compulsory in secondary schools, whilst in the United Kingdom the subject is offered as an elective since 2001, although financial institutions offer such education to everybody. Though not being a compulsory subject in schools of the United Kingdom, the contents of financial education are present in other compulsory school subjects such as mathematics and civic education (Personal Finance Education Group 2016). In Spain, there is not an official programme targeting financial literacy in schools yet.

The measurement of financial literacy has been gaining exposure during the recent years, with recent studies exposing a shockingly low level of financial education by the people all around the world. Nieri (2007) has performed a survey in Spain, Italy and France and the findings from her study show that most people belonging to the classes with the lowest income did not spend time comparing costs and reading contracts of financial services from institutions such as banks, and they also did not have the ability to make a fair comparison of these services. In addition, people in general tend to overrate their knowledge in financial products and services and they are also not very approachable to receive financial education if they do not see a first-instance relevance in it, making it one of the factors that make programmes that promote awareness of financial literacy so important.

The activities being currently carried on in Spain are led by the Bank of Spain, whose raises awareness amongst costumers so they can purchase financial services with their interests well-protected and a higher understanding of what they are acquiring. They also provide guidance on how to fill a complaint in case the customer has any issue with his or her current bank. The banks affiliated to this programme have dedicated spaces on their websites aiming to educate the customers, emphasising products such as pension plans, savings accounts, credit cards, loans and investment funds, also providing information regarding the ruling legislation. These pages promote education by explaining some crucial financial concepts such as commissions, fees, returns and interest rates. (European Banking Federation, 2009).

The most relevant initiative taken in Spain has been the Financial Education Plan implement by the Bank of Spain, the Ministry of Finance and the Securities Exchange Commission (CNMV), that was first implemented from 2008 to 2012 and currently is in its second implementation, from 2013 to 2017. This new endeavour intends to focus on students and adults and it identifies the most suitable approaches to spread financial education to each of these groups as well as their specific needs (Banco de España 2013).

The results from 2008 to 2012 for the 2013's report stress that it is needed to keep pushing forward the introduction of financial education in a partnership between public and private sector. The plan intends to increase the financial literacy as well as to change the attitudes and behaviours of the individuals, encouraging them to set aside emotions or third-party advices whilst taking important financial decisions. Another important point is that people need to be discouraged to take short term decisions in detriment of long term ones. The study also emphasises the importance of the OECD as a coordinator for such programmes incentivising financial education on an international level. (Banco de España 2013).

On an international level, the Standard and Poor's carried its Global Financial Literacy Survey in 2014, which aims to measure the financial literacy amongst adults around the world. The survey covered 150,000 people in over 140 countries worldwide, measuring people's knowledge in numeracy, inflation, risk compounding and risk diversification.

In a partnership with the Global Financial Literacy Excellence Center of the George Washington University, the survey aimed to help to improve the financial literacy worldwide by providing to individuals and governments reliable information regarding how far financial inclusion is in each studied country so they can be encouraged to work on it. They argue that

financially illiterate people are being left out of the market as they do not know or understand the financial products and services available for them, therefore the more financially literate people we have, the more the overall economy would benefit from them (Standard and Poor's 2014).

Although there are some initiatives carried on by private and public institutions to promote financial literacy, they are not enough if a measure is not being taken to avoid an irrational behaviour of the consumers. Nonetheless, during a period of economic recession is when individuals are more open to learn, since they start to realise risks with a higher level of concern and have more worry on how they will achieve their financial objectives.

2. METHODOLOGICAL APPROACH AND DATASET

This chapter presents the research methodology applied in this study and the definition and conveyance of the dataset used in the subsequent analysis. The research questions are explored, followed by a description of the setting, the dataset, the research design and the strategy and measurement of the data analysed.

2.1. Research questions

The research aims to answer whether the household disposable income and the level of financial literacy in Spain and in the European Union are positively correlated. Specifically, the study aims to analyse how the level of financial literacy of a population can positively influence the household disposable income and its better management by households.

The main research question is whether the level of financial literacy in Spain and in the selected countries of the European Union (Austria, Belgium, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Ireland, Italy, Latvia, the Netherlands, Poland, Portugal, Slovakia, Slovenia, Sweden and the United Kingdom) have a positive or negative correlation with the household disposable income and what is the measurement of this impact. An alternate research question is brought up to answer whether the level of financial literacy amongst the youth is consistent with the level of financial literacy amongst adults, according to the data from the OECD-PISA 2012 results and the Standard and Poor's Global Financial Literacy Survey index.

2.2. Setting

The data come from the OECD, which collects its data for all members' countries: Australia, Austria, Belgium, Canada, Chile, the Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Israel, Italy, Japan, Latvia, Luxembourg, Mexico, the Netherlands, New Zealand, Norway, Poland, Portugal, Slovakia, Slovenia, South Korea, Spain, Sweden, Switzerland, Turkey, the United Kingdom and the United States (Joint Research Centre-European Commission 2008). Therefore, a fair

comparison with the Spanish indicators whilst using the OECD dataset is only possible when comparing it with one of these other OECD countries since the statistics would be collected using the same methodology.

The member countries provide their data throughout official local statistical institutions, private organisations and departments within their governments, which are later standardised by the OECD for statistical and fair comparison purposes. In the case of Spain, the data used in this study is collected through the National Statistics Institute (INE) and then redirected to the OECD (OECD 2012).

Standard and Poor's conducted its survey by interviewing households in 147 countries rather face-to-face or by telephone, with a set of questions concerning basic financial topics (Standard and Poor's 2014). The OECD-PISA data assess over 29,000 students in their financial literacy throughout a standardised test in Australia, Belgium, China, Colombia, Croatia, Czech Republic, Estonia, France, Israel, Italy, Latvia, New Zealand, Poland, Russian Federation, Slovakia, Slovenia, Spain, and the United States (OECD 2014).

2.3. Dataset

The dataset for indicators on household disposable income, inflation rate, unemployment rate, unemployment rate by upper secondary non-tertiary education level and the PISA results by the OECD are used for the analyses in this thesis. The Global Financial Literacy survey developed by the Standard and Poor's is also used in this study.

The OECD dataset is large and reliable, making possible to also provide quite trustworthy results that would have been very difficult to achieve if a primary analysis including the collection of own data would have been made. Whilst using OECD's large dataset, it is therefore possible to analyse social trends with a certain precision, since their methods for data collection make use of random samples, making generalisation possible that way. Their extensive research has been on-going for several years, which also allows the drawing of a timeline on the outcomes.

The OECD indicator of household disposable income represents the sum of all the income within a household minus the wealth and social security contributions and taxes. It is also known as disposable personal income, or the amount of money available for a free use of the choice of an individual. (OECD 2017).

The inflation rate is measured by the OECD through the consumer price index (CPI), which indicates the fluctuation in the prices of the basic goods and services in the studied countries, always considering the same quantity of goods and services. The measurement is made on the basis of its annual growth rate. A high inflation rate usually carries a decrease in living standards, whilst a low inflation rate carries an increase in living standards, especially if it is followed by an increase in the household disposable income. (OECD 2017).

The unemployment rate is the percentage of the equivalent number of unemployed people within the labour force. The labour force is consisted of the people currently in paid work, self-employed and unemployed. For one person to be accounted as unemployed, it must be without work but willing to find employment as well as taking the appropriate measures to find work, such as registering itself at the local employment bureau for instance. The OECD indicators are further divided into three categories according to their respective education levels: below upper secondary, upper secondary non-tertiary and tertiary. In this study, the indicator of unemployment rate by upper secondary non-tertiary education level is also used. (OECD 2017).

The PISA survey is an assessment taken in form of examination for pupils of 15 years old in schools within the OECD member countries, with a frequency of every 3 years (PISA 2015). In the last survey, 72 countries were assessed, with a range of 4,500 to 10,000 students. The main goal of the PISA study is to measure the level of knowledge that students have at the end of their compulsory education. The examination consists in three different sections for reading, mathematics and science. For the financial literacy skills assessment, 29,000 students were assessed in 18 member countries. Afterwards, the participating countries are ranked according to their scores and the full report is published by the OECD. (OECD 2016).

The Standard and Poor's Global Financial Literacy survey was conducted in 148 countries with around 150,000 people and had its results ranked afterwards according to the level of financial literacy of adults in the selected countries. Through interviews, people were asked about four different basic financial concepts divided in five questions: inflation, numeracy, compound interest and risk diversification. (Standard and Poor's 2014).

2.4. Research design

The methodology applied in this thesis in order to identify the relationship between the household disposable income and the level of financial literacy in Spain and in the European Union between the period of 2006 and 2014 is the construction of a secondary analysis, making use of quantitative methods and OLS linear regression analyses to observe existent patterns.

The use of a secondary analysis method has been chosen to allow a reliable investigation using the existent excellent dataset provided by the OECD. To draw valid conclusions regarding the correlation between the household disposable income and the level of financial literacy in a population, it is important to make use of already available data sourced from trusted organisations because their statistics are standardised and provide a homogeneity whilst making comparisons from one country to another or within the same country in a certain time frame. Regarding the use of the Standard and Poor's survey data, the biggest advantage in relying on it is that the research questions of their study were carefully thought to measure the financial knowledge of individuals following the same priorities aimed in this study, which is the focus on the everyday financial practical issues people have rather than very technical and specific knowledge in theoretical finance.

2.5. Strategy and measurement

OLS linear regression analyses were performed to find the correlation between the household disposable income and the level of financial literacy in Spain and the European Union from 2006 to 2014. The regression analyses were calculated considering the data from the OECD on household disposable income and the data from the Standard and Poor's Global Financial Literacy survey index. Empirical analyses follow the regression results whilst analysing the equations, Pearson coefficients, coefficients of determination R-squared and P-values returned on the regression outputs.

3. ANALYSIS AND RESULTS

This chapter goes through the results of the research made following the theoretical and methodological reviews. Individual OLS linear regression analyses were made for each year from 2006 to 2014 in order to observe if there is indeed a linear relationship between the level of financial literacy amongst adults, according to the data provided by the Standard and Poor's Global Financial Literacy Survey index (see Appendix 2 for the complete table), and the household disposable income, relying on the data provided by the Organisation for Economic Co-operation and Development (OECD). The regression analyses were made on a yearly basis referring to the countries of Austria, Belgium, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Ireland, Italy, Latvia, the Netherlands, Poland, Portugal, Slovakia, Slovenia, Spain, Sweden and the United Kingdom.

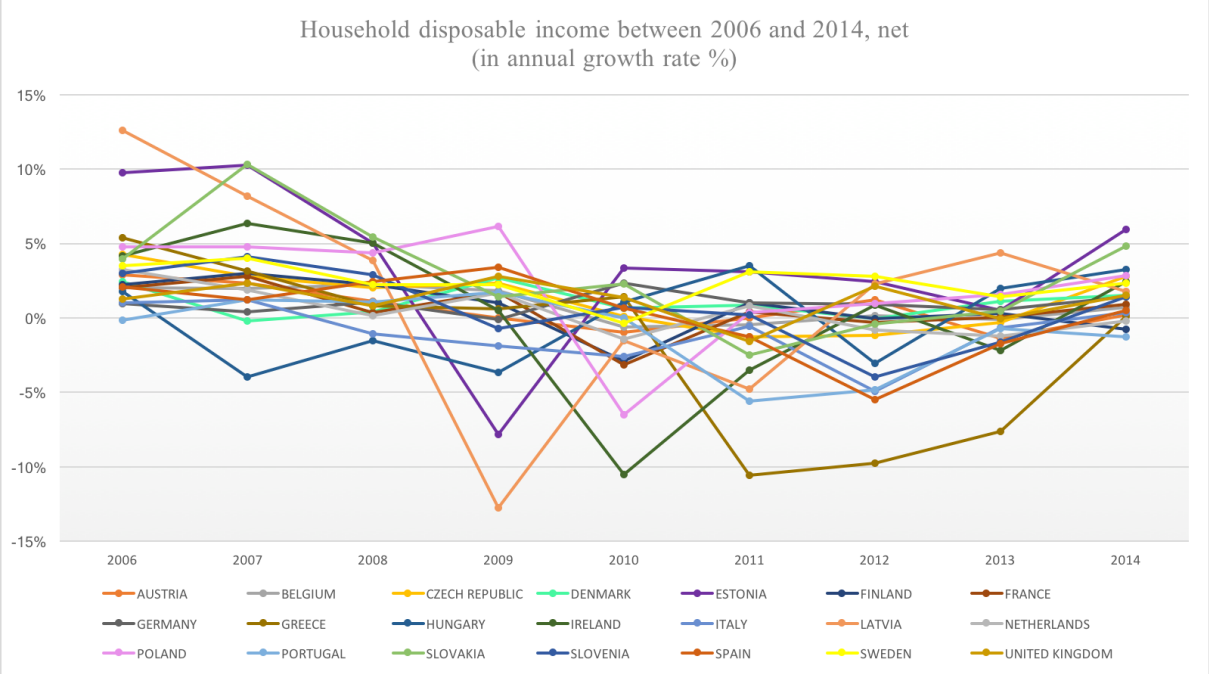

Figure 4. Timeline of the household disposable income between 2006 and 2014 in the selected European countries

Source: (OECD 2017)

The Figure 4 gives a brief overview on the household disposable income between 2006 and 2014 in the studied countries within the European Union, aiming to visually show the variances specially during the tougher years of 2009, 2010 and 2011 as well as the

subsequent slow recovery during the years of 2013 and 2014 in countries such as Greece, Spain, Portugal, Slovenia, Hungary, Estonia and Slovakia.

The following analyses of the OLS linear regressions performed for each year from 2006 to 2014 assume an alpha of 0.05 and the strength of the Pearson coefficient is classified according to the guide developed by Evans (1996).

3.1. The wake of the recession: 2006 to 2008

During the years of 2006 and 2007, whilst the Great Recession was still in its incubation period and its effects over Europe were still yet to be seen, the unemployment rates and Gross Domestic Products (GDPs) were still rather stable and kept below 9 per cent in Spain and the European Union, as explored in the first chapter of this study. The aim of the following analyses is to find out whether the level of financial literacy had a correlation with the household disposable income whilst the financial crisis was not yet deeply affecting the households.

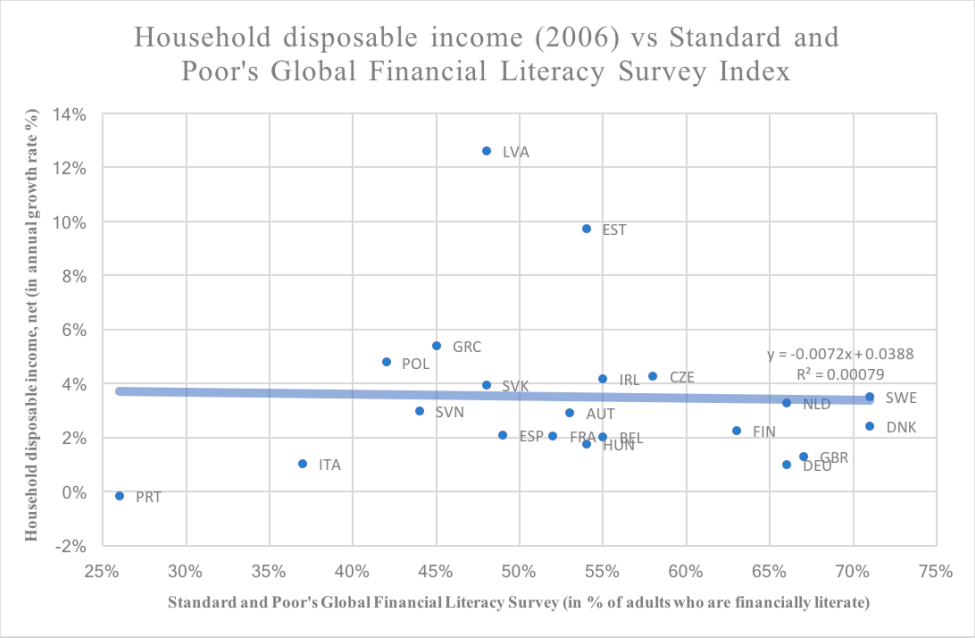

Figure 5. Correlation between the household disposable income in 2006 and the Standard and Poor's Global Financial Literacy Survey index

Source: (developed by the author, with data from OECD 2017; S&P 2014)

The regression analysis of the year of 2006 as represented by the Figure 5 returns as an output the equation y = –0.0072x +0.0388, which indicates a very weak negative linear correlation between the household disposable income and the level of financial literacy amongst adults in the indicated countries. The Pearson coefficient of the regression which is equal to –0.0280214 also indicates this very weak linear correlation. The coefficient of determination R-squared of 0.000785199 confirms the very weak fit of the regression. The P-value of the regression of 0.904031355 > 0.05 indicates that the null hypothesis shall not be rejected as there is a chance of 90.40% that it is true. The results obtained indicate that there is not enough statistical substance for a further analysis.

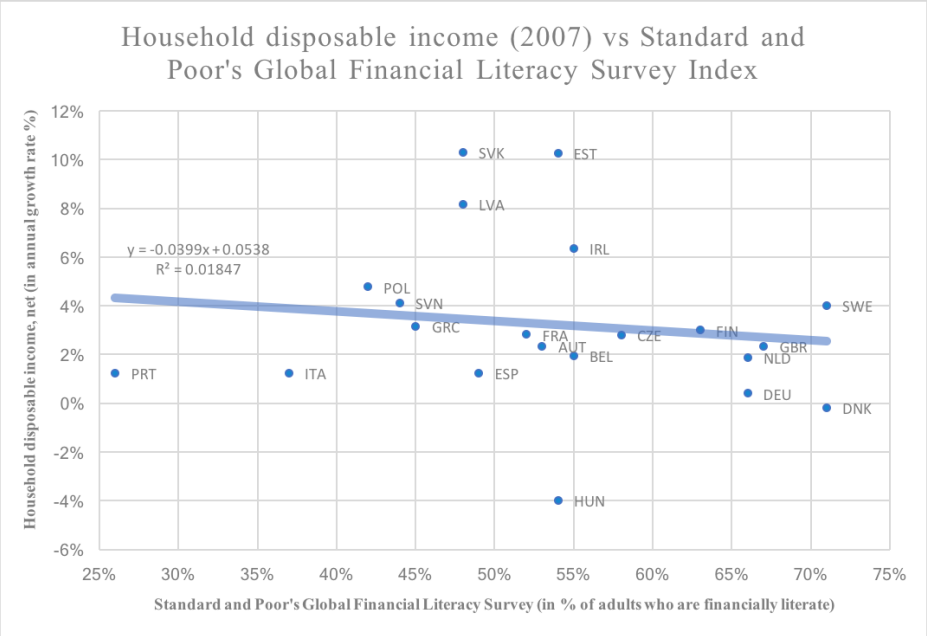

Figure 6. Correlation between the household disposable income in 2007 and the Standard and Poor's Global Financial Literacy Survey index

Source: (developed by the author, with data from OECD 2017; S&P 2014)

During the year of 2007, as shown in the Figure 6, the output returned an equation of y = –0.0399x +0.0538, also indicating a very weak negative linear correlation between the variables. The Pearson coefficient of –0.13590877 confirms this very weak negative correlation with some strength. The coefficient of determination R-squared of 0.018471194 also indicates this very weak fit of the regression. The P-value of the regression is of 0.556927127 > 0.05, suggesting that there is a chance of 55.69% that the null hypothesis for

the model is true, therefore it shall not be rejected. These results suggest that there is not enough statistical substance for a further analysis.

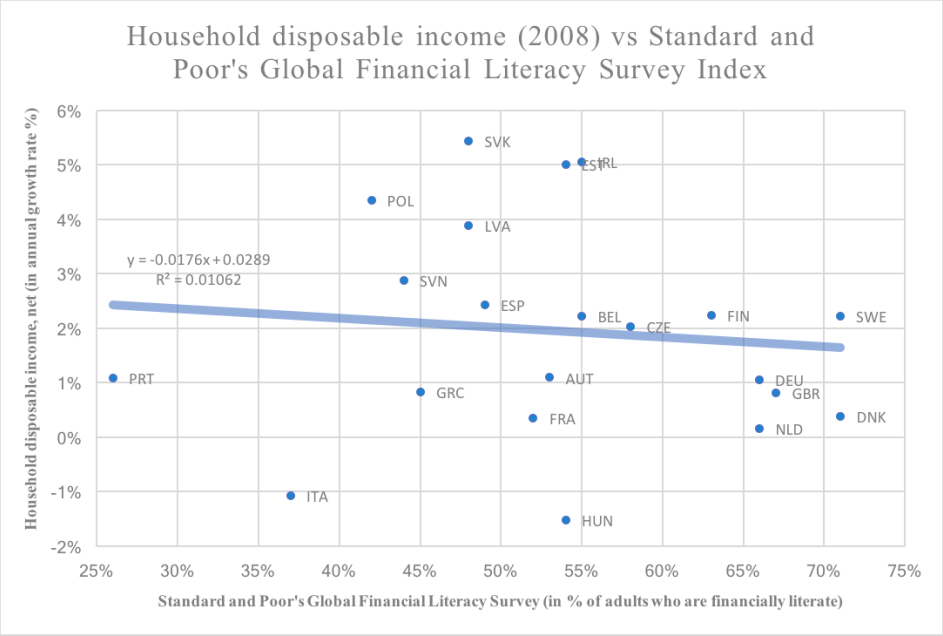

Figure 7. Correlation between the household disposable income in 2008 and the Standard and Poor's Global Financial Literacy Survey index

Source: (developed by the author, with data from OECD 2017; S&P 2014)

The regression output of the year of 2008, as represented by the Figure 7, returns the equation y = –0.0176x +0.0289, pointing towards a very weak negative linear correlation between the variables. The Pearson coefficient of –0.10306186 confirms this very weak negative correlation. The coefficient of determination R-squared of 0.010621746 also shows a very weak fit of the regression model. The P-value of the regression is of 0.656640571 > 0.05, indicating that there is a chance of 65.66% that the null hypothesis for the model is true and shall not be rejected. The results indicate that there is not enough statistical substance for a further analysis.

Whilst analysing the regression outputs of 2006, 2007 and 2008 it is possible to see that they share a negative linear correlation between the household disposable income and the level of financial literacy amongst adults, although lacking in statistical substance, suggesting that, before the deep effects of the financial recession, the level of financial literacy had a non-relevant impact on the household disposable income of the households in the studied countries.

3.2. The peak of the recession: 2009 to 2012

In the year of 2009 the deep effects of the Great Recession could start to be felt by the households as the crisis hit strong in Europe, bringing what ahead would turn into one of the worst recessions of our century. Four quite difficult years for the economy came beginning from 2009, and it consequently changed the habits of the households and impacted them. As showed before in the Figure 1, the unemployment rates dramatically increased starting from 2009 until they reached historic levels in 2013. In Spain specifically, the increase in the unemployment rates were significantly superior than in the rest of the European Union. The following regression analyses aim to examine how the household disposable income reacted related to the level of financial literacy amongst adults in the selected European countries during these toughest years of the financial recession.

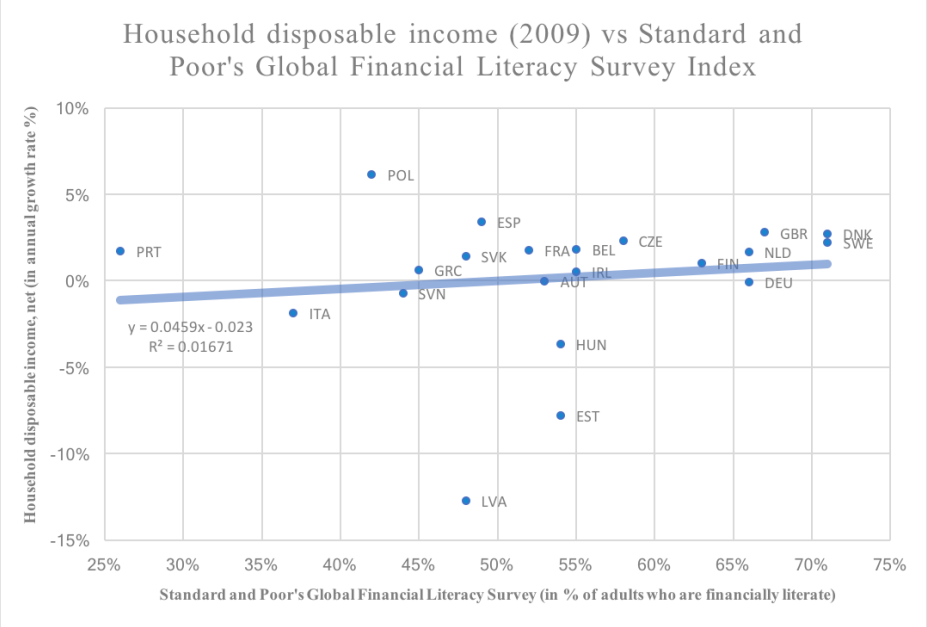

Figure 8. Correlation between the household disposable income in 2009 and the Standard and Poor's Global Financial Literacy Survey index

Source: (developed by the author, with data from OECD 2017; S&P 2014)

The regression of the year of 2009 as indicated by the Figure 8 returns the equation of y = 0.0459x –0.023, indicating a very weak positive linear correlation between the household disposable income and the level of financial literacy amongst adults in the indicated countries. The Pearson coefficient of the regression of 0.129274567 confirms this very weak positive

linear correlation. The coefficient of determination R-squared of 0.016711914 also indicates that there is a very weak fit of the regression model. The P-value of the regression is of 0.576511427 > 0.05, suggesting that there is a chance of 57.65% that the null hypothesis for the model is true, therefore it shall not be rejected. The results indicate that there is not enough statistical substance for a further analysis.

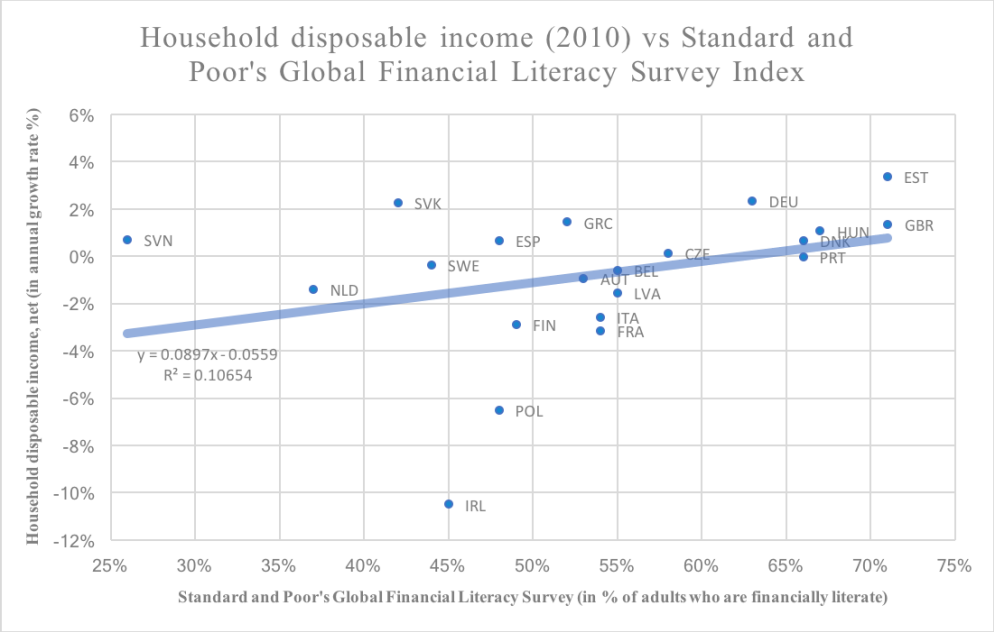

Figure 9. Correlation between the household disposable income in 2010 and the Standard and Poor's Global Financial Literacy Survey index

Source: (developed by the author, with data from OECD 2017; S&P 2014)

The regression output of the year of 2010 as indicated by the Figure 9 returns the equation of y = 0.0897x –0.0559, indicating a weak to moderate positive linear correlation between the household disposable income and the level of financial literacy amongst adults in the indicated countries. The Pearson coefficient of the regression of 0.326398119 confirms this weak to moderate positive linear correlation. The coefficient of determination R-squared of 0.106535732 shows a fit of the regression model that heightens towards significance as it indicates that 10.65% of the variation in the household disposable income can be explained by the level of financial literacy amongst adults. The P-value of the regression is of 0.14872368 > 0.05, suggesting that there is a chance of 14.87% that the null hypothesis for the model is true therefore it shall not be rejected, although it approaches to the alpha level of significance. The results obtained indicate that in 2010 the level of financial literacy amongst adults started

to have a statistical substance when compared to the household disposable income, suggesting that during this year when the effects of the crisis were more present within the households the level of knowledge in financial topics started to become more relevant.

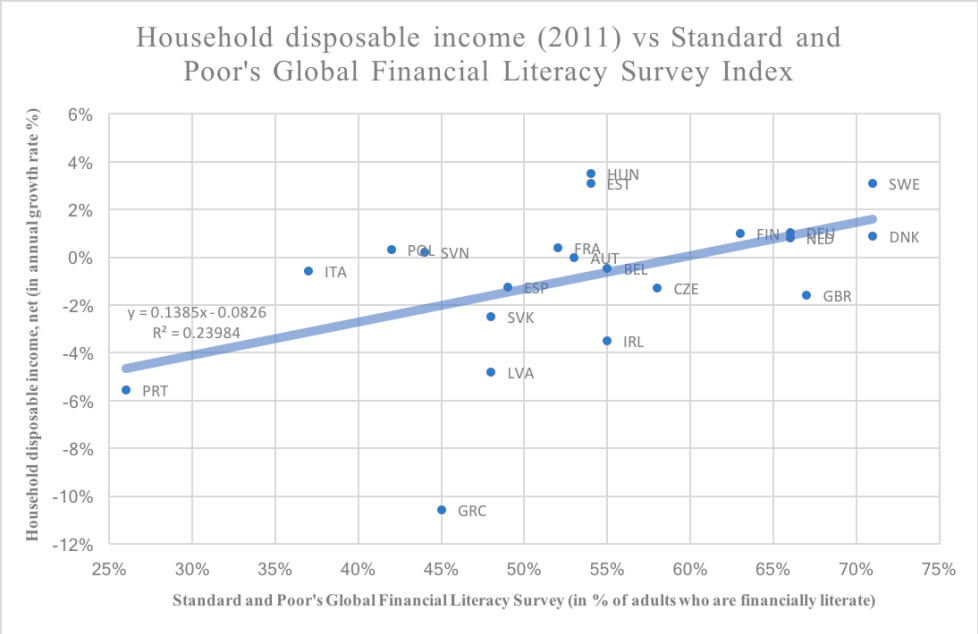

Figure 10. Correlation between the household disposable income in 2011 and the Standard and Poor's Global Financial Literacy Survey index

Source: (developed by the author, with data from OECD 2017; S&P 2014)

As of the year of 2011, the output of the regression analysis as indicated by the Figure 10 returns the equation of y = 0.1385x –0.0826, indicating a moderate positive linear correlation between the household disposable income and the level of financial literacy amongst adults in the indicated countries. The Pearson coefficient of the regression of 0.48973027 confirms this moderate positive linear correlation. The coefficient of determination R-squared of 0.239835738 shows a fit of the regression model that heightens towards significance as it indicates that 23.98% of the variation in the household disposable income can be explained by the level of financial literacy amongst adults. The P-value of the regression is of 0.024230495 < 0.05, which indicates that the null hypothesis shall be rejected and the study's hypothesis shall be accepted with confidence. The results suggest a very good statistical relevance, indicating a good fit of the regression model stating that the level of financial literacy amongst households indeed had an impact on the household disposable income.

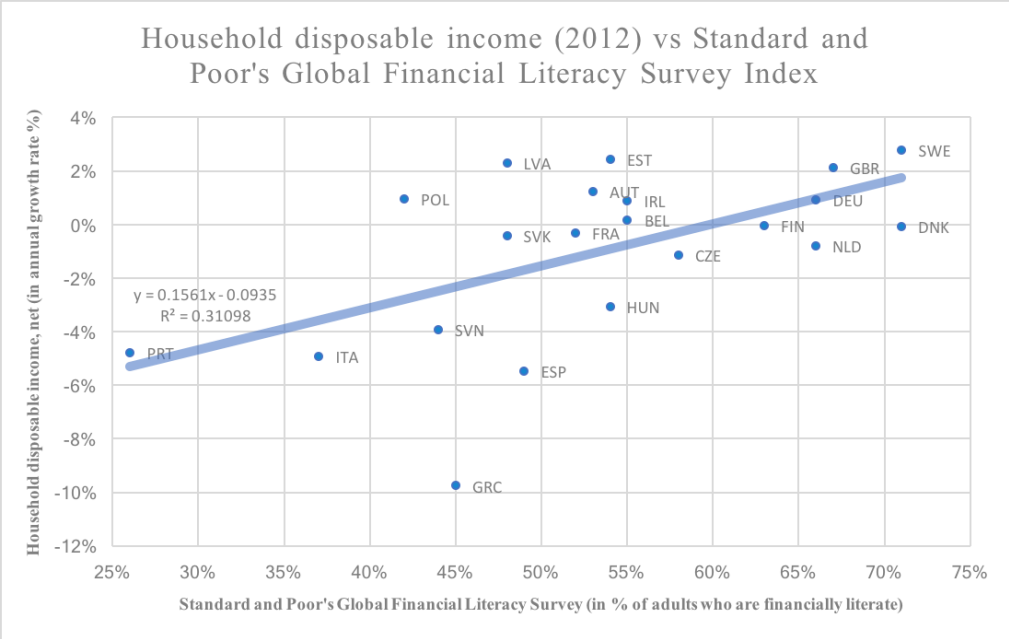

Figure 11. Correlation between the household disposable income in 2012 and the Standard and Poor's Global Financial Literacy Survey index

Source: (developed by the author, with data from OECD 2017; S&P 2014)

The regression of the year of 2012, as pictured by the Figure 11, returns the equation of y = 0.1561x –0.0935, indicating a moderate to strong positive linear correlation between the household disposable income and the level of financial literacy amongst adults in the indicated countries. The Pearson coefficient of the regression of 0.557660064 confirms this moderate to strong positive linear correlation. The coefficient of determination R-squared of 0.310984747 shows a fit of the regression model that weights significance as it indicates that 31.09% of the variation in the household disposable income can be explained by the level of financial literacy amongst adults. The P-value of the regression is of 0.008622599 < 0.05, which indicates that the null hypothesis shall be rejected and the study's hypothesis shall be accepted with confidence. The results suggest a very good statistical relevance, indicating a good fit of the regression model stating that the level of financial literacy amongst households indeed had an impact on the household disposable income.

Whilst analysing the regression outputs of 2009, 2010, 2011 and 2012 it is seen that they all have a positive linear correlation between the household disposable income and the level of financial literacy amongst adults, with 2010, 2011 and 2012 sharing a significant positive linear correlation that ranges from moderate to strong. These results suggest that when the financial recession was at its peak, the relevance of the level of financial literacy

was enhanced in the studied countries. During 2011 and 2012 specifically, the results were below the alpha threshold which rejected the null hypothesis with confidence, demonstrating the strength of the study's hypothesis during these years.

3.3. Last stage of the recession: 2013 and 2014

During the years of 2013 and 2014 the Great Recession approached to its end, and its effects such as the unemployment and inflation rates started to stabilise to then start their decrease throughout the countries belonging to the European Union. The subsequent regression analyses will briefly observe how the level of financial literacy was correlated with the household disposable income during the last stage of the financial crisis.

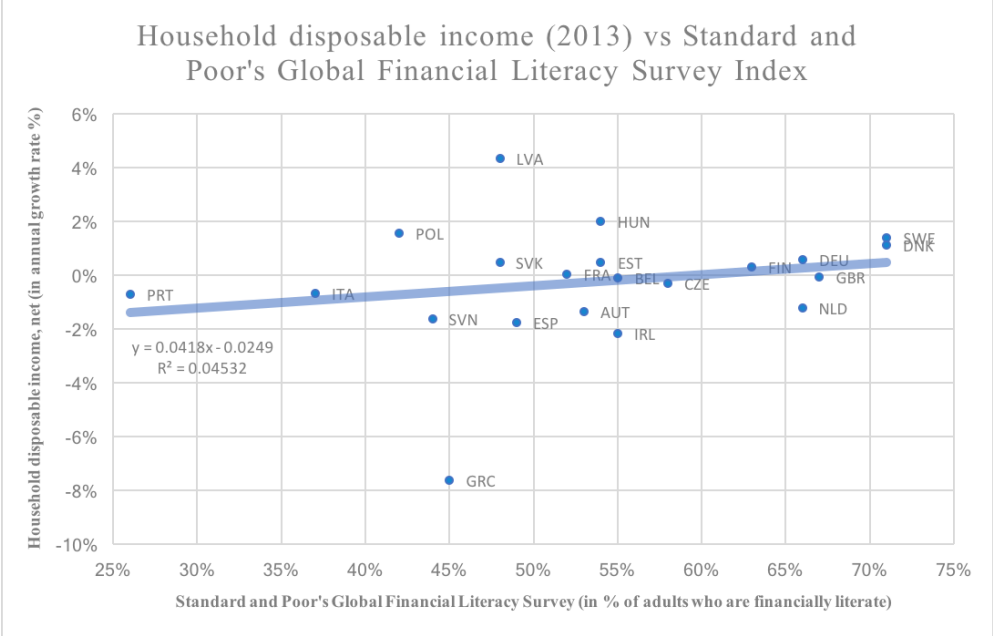

Figure 12. Correlation between the household disposable income in 2013 and the Standard and Poor's Global Financial Literacy Survey index

Source: (developed by the author, with data from OECD 2017; S&P 2014)

The regression output of the year of 2013 as indicated by the Figure 12 returns the equation of y = 0.0418x –0.0249, indicating a weak positive linear correlation between the household disposable income and the level of financial literacy amongst adults in the indicated countries. The Pearson coefficient of the regression of 0.212890595 confirms this

weak positive linear correlation. The coefficient of determination R-squared of 0.045322406 shows a fit of the regression model with a slender movement towards significance as it indicates that 4.53% of the variation in the household disposable income can be explained by the level of financial literacy amongst adults. The P-value of the regression returned the value of 0.354169489 > 0.05, suggesting that there is a chance of 35.41% that the null hypothesis for the model is true and therefore it shall not be rejected. The results suggest some statistical relevance, indicating a rather weak fit of the regression model stating that the level of financial literacy amongst households may have had a meagre impact on the household disposable income.

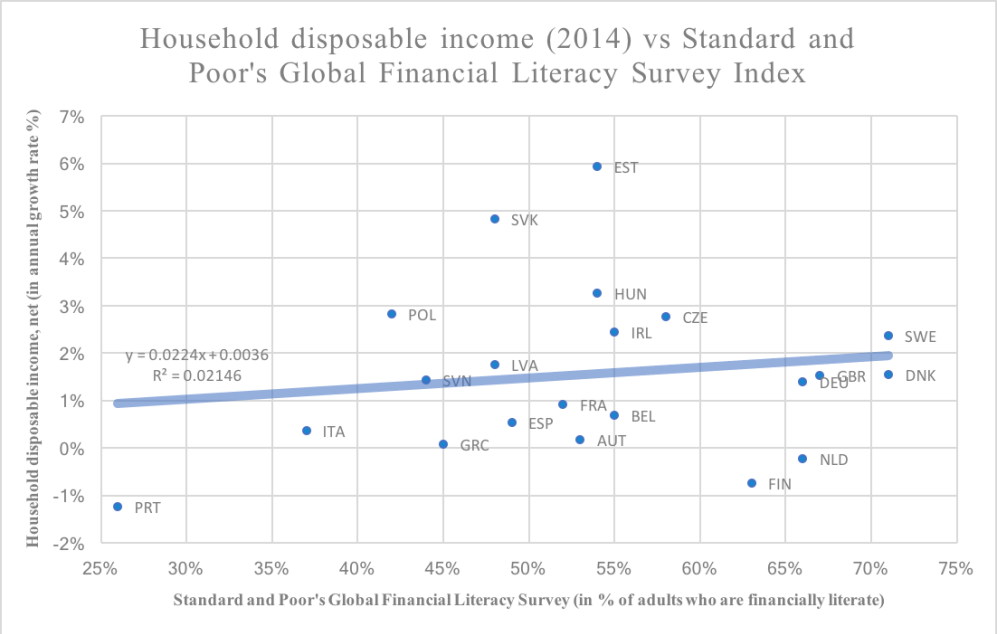

Figure 13. Correlation between the household disposable income in 2014 and the Standard and Poor's Global Financial Literacy Survey index

Source: (developed by the author, with data from OECD 2017; S&P 2014)

During the year of 2014 as pictured by the Figure 13, the regression analysis returned the equation y = 0.0224x +0.0036, which indicates a very weak positive linear correlation between the household disposable income and the level of financial literacy amongst adults in the indicated countries. The Pearson coefficient of the regression of 0.146492379 confirms this very weak positive linear correlation. The coefficient of determination R-squared of 0.021460017 indicates that 2.14% of the variation in the household disposable income can be explained by the level of financial literacy amongst adults. The P-value of the regression is of

0.526316586 > 0.05, suggesting that there is a chance of 52.63% that the null hypothesis for the model is true and therefore it shall not be rejected. The results indicate some statistical relevance, suggesting a rather weak fit of the regression model stating that the level of financial literacy amongst households may have had a humble impact on the household disposable income.

The analyses of the regressions of 2013 and 2014 indicate that both continue to have a positive linear correlation between the household disposable income and the level of financial literacy amongst adults, although with less strength than during the period of 2008 to 2012. The results found indicate that during the last stage of the financial recession, the relevance of the level of financial literacy amongst adults was still significant, although not as high as when the financial crisis was at its worst levels.

Table 2. Summary of the regression analyses outputs

Year	Equation	Pearson coefficient (R)	R-squared (R^2)	P-value
2006	y = –0.0072x +0.0388	-0.0280214	0.000785199	0,904031355
2007	y = –0.0399x +0.0538	-0.13590877	0.018471194	0,556927127
2008	y = –0.0176x +0.0289	-0.10306186	0.010621746	0,656640571
2009	y = 0.0459x –0.023	0.129274567	0.016711914	0,576511427
2010	y = 0.0897x –0.0559	0.326398119	0.106535732	0,14872368
2011	y = 0.1385x –0.0826	0.48973027	0.239835738	0,024230495
2012	y = 0.1561x –0.0935	0.557660064	0.310984747	0,008622599
2013	y = 0.0418x –0.0249	0.212890595	0.045322406	0,354169489
2014	y = 0.0224x +0.0036	0.146492379	0.021460017	0,526316586

Source: (Author's calculations based on the data provided by the OECD 2017 and S&P 2014)

The Table 2 pictured above summarises all the results obtained from the regression analyses from 2006 to 2014. The equations indicated that between 2006 and 2008 the regressions had a negative linear correlation, whilst within the remaining years a moderate to strong positive linear correlation could be observed in the years of 2011 and 2012, which is a noteworthy remark considering that the financial recession was at its worst during these years. The Pearson coefficients obtained confirmed the highest strengths on the regressions during the toughest years of the Great Recession of 2011 and 2012, whilst the coefficients of determination R-squared supported this strength. The P-value of the regressions also confirmed that the null hypothesis could only be rejected in 2011 and 2012. Analysing the

performance of Spain, it is possible to see that in all regressions the Spanish data did not severely outline from the regressions' trend lines, confirming the relevance of the results.

3.4. The PISA results and the next steps for financial literacy

The output of the OECD's PISA Results: Students and Money on the level of financial literacy amongst 15 years old within the schools of 18 OECD member countries in 2012 (see appendix 1 for the full results) returned a worrying knowledge of the young generation towards basic financial topics. One in seven students belonging to the assessed countries were not able to make correct basic decisions regarding ordinary financial problems whilst only one in ten were able to successfully solve the most complex tasks. (OECD 2014).

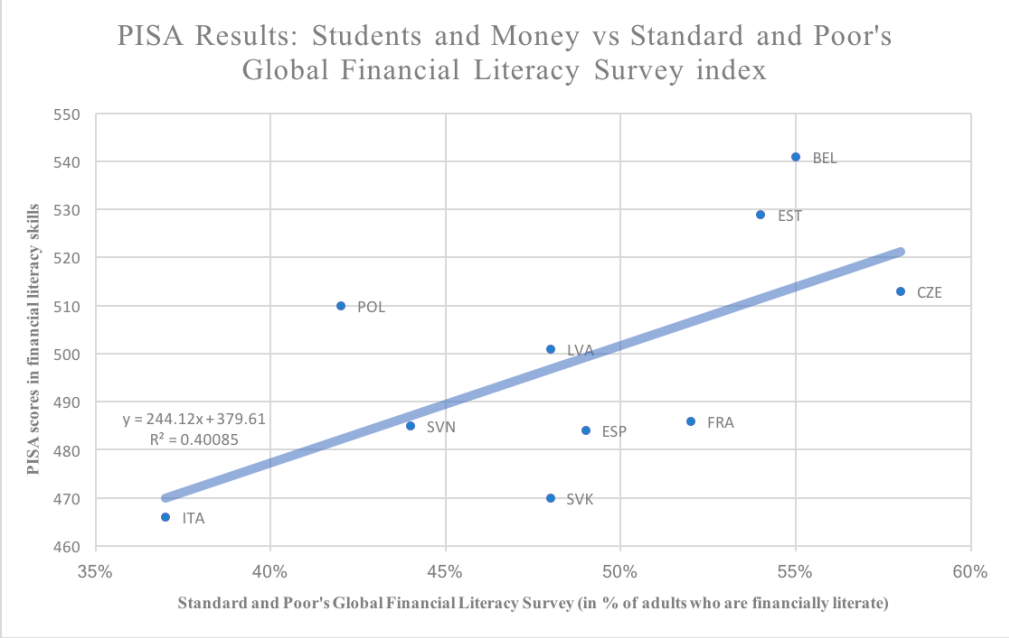

Figure 14. Correlation between the PISA Results: Students and Money and the Standard and Poor's Global Financial Literacy Survey index

Source: (developed by the author, with data from PISA 2012; S&P 2014)

The Figure 14 shows the correlation between the PISA results: Students and Money on financial literacy skills in 2012 and the Standard and Poor's Global Financial Literacy Survey index in 2015. The selected countries for the regression analysis were chosen based on their mutual participation in the OECD and the Standard and Poor's study as well as in the

previous analyses of this thesis, in order to therefore draw a fair comparison. It is possible to observe that the results of the awareness in financial literacy between the 15-year-old and the adults belonging from the same countries are very strongly positively correlated, indicating that there is a resemblance between the knowledge owned by the older and the younger generations.

What calls for a reflexion in this correlation is whether the younger generations are improving their financial literacy skills when compared to their parents' generation, suggesting there is still lots of room for improvement when it comes to financial education within the schools. Some countries such as Belgium, Estonia and Poland showed that the PISA results are above the expected average when compared to the Standard and Poor's scores, indicating that the younger people are better educated in financial topics than their older generations. However, in France, Slovakia and Spain the results from the younger people are way below the expected average, suggesting that the older generations have better financial literacy skills.

The OECD's PISA results called the attention to the fact that the reading and mathematics skills have a positive influence on financial literacy, although they are not always correlated. The main observation made from the study concluded that further research on financial literacy is needed in order to find out the best methods to improve the financial literacy skills amongst the youth. (OECD 2014).

CONCLUSIONS

During the period that anticipated the Great Recession, which comprised the years of 2006 to 2008, it is possible to conclude throughout the results of the analyses made that the level of financial literacy amongst adults in Spain and in the European Union had a very weak negative correlation with the household disposable income. This output suggests that whilst the economy was somehow stable and the crisis had not landed yet, the financial literacy skills of the households did not show much statistical relevance when associated with the management of the net income they would take home, and it actually showed a slightly negative association between the two variables starting to even suggest a reverse trend.

Throughout the collapse and development of the financial crisis between 2009 and 2012, positive correlations between the financial literacy amongst adults and the household disposable income were found, with the results varying from weak to moderate, suggesting an uptrend in the relevance of the financial literacy when it comes to financial management at home during a tough period of financial recession. During the year of 2009, at the beginning of the worst season of the Great Recession, the correlation was still at a very weak level however showing a trend reverse when compared to 2008. The year of 2010 returned a weak positive correlation, however the years of 2011 and 2012 presented moderate levels in their linear regression analysis outputs, indicating that during the presence of a substantial and strong financial crisis, the countries with the highest scores in financial literacy skills are also the ones which witnessed the biggest growth in their household disposable income.

In 2013 and 2014, with the approach of the end of the crisis, the analyses results returned a weak and a very weak positive correlation, respectively, between the financial literacy skills amongst adults and the household disposable income. These results suggest that after the toughest years of the recession and with the crisis approaching to its end, the knowledge by households in basic financial topics were heading to a downtrend representing less relevance. Spain's results over the years did not severely outlie from the regressions, indicating that the country can be included in the patterns encountered. The results overall indicate that there is a possible trend in which people tend to apply more their financial skills on their personal finances at home when the economic situation is at its worst, whilst when the economy is not as threatening, people would tend to make less use of their skills, if not any use at all in the situation of an economic bonanza.

The results of the correlation between the young generations through the PISA results in financial literacy from their 2012 study and the older generations via the Standard and Poor's Global Financial Literacy Survey index show a moderate to strong relationship between them, indicating that the younger generations are not actually having a significant improvement in their financial literacy skills as it would be expected. Whilst analysing this correlation in Spain within the regression, it is observed that the younger generation is not as financially literate as their parents', as their PISA results are lower than the results obtained in the Standard and Poor's index amongst the adults.

The weak fit of most linear regression analyses performed in this study can be explained by the fact that there are a handful of factors that influence the variation in the household disposable income, therefore the financial literacy alone would not be able to solely explain these changes. The number of samples is also not the ideal as a bigger amount would have been statistically better for a regression analysis, however not all countries in the European Union have both statistics for the household disposable income and for the level of financial literacy.

Additionally, the dataset available is somewhat limited, since the financial literacy survey held by the Standard and Poor's from 2014 is the only global comprehensive source of financial literacy statistics amongst adults available up to the date. The PISA results from 2012 are also the only current statistics available on financial literacy amongst the youth on a global scale, as the second edition of the results from the year of 2015 are not published yet.

The dataset from the OECD is also not the ideal for such study because the aim is to compare how the households are influenced by their financial literacy skills when taking decisions that will influence their discretionary income. However, there are no statistics on the discretionary income, but only on the household disposable income, which is the one that come closer to what is needed to start some analysis. The disposable income represents the net income the household has available for its expenditures after the income taxes, whereas the discretionary income is the income that is left after all the first-need expenditures are deducted out of the disposable income, such as rent, groceries and utility bills.

Such differentiation is important because the cost of such basic expenditures vary greatly between countries. For instance, even if salaries are significantly higher in Switzerland than in Portugal, the expenses are also likely higher, but not necessarily perfectly proportional on the increase in income. In fact, even when comparing the different Autonomous

Communities within Spain, the salaries and cost of living vary greatly. Therefore, a fairer comparison between countries would be made once the discretionary income is pondered.

The lack of more appropriate dataset on both discretionary income and the level of financial literacy, combined with the scarce research in the field of financial education suggests that it is a promising subject for further studies and research, especially when it is related to Spain where research in this field is particularly scarce. Greater and deeper researches on the financial education and management topic can also help governments and institutions to educate the population better in order to possibly alleviate the negative effects on the households' personal finances during a possible subsequent economic recession, as well as improve a nation's overall wealth as better educated citizens also may become the future consumers of the new financial products and services available in the markets.

Better datasets shall be developed, such as statistics on the discretionary income, as well as better and perhaps more thorough and regular studies and statistics on financial literacy skills on a global level. However, the concern with financial education is something very recent and as the awareness of the issue tends to grow, so will the research and development of the ongoing projects aiming to increase the global financial literacy.

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APPENDICES

Appendix 1. Performance in science, reading, mathematics and financial literacy on the 2015 and 2012 PISA study

Country	Science	Reading	Mathematics	Financial Literacy (2012)
OECD average	493	493	490	500
Singapore	556	535	564	n/a
Japan	538	516	532	n/a
Estonia	534	519	520	529
Chinese Taipei	532	497	542	n/a
Finland	531	526	511	n/a
Macao (China)	529	509	544	n/a
Canada	528	527	516	n/a
Viet Nam	525	487	495	n/a
Hong Kong (China)	523	527	548	n/a
B-S-J-G (China)	518	494	531	603 (Shanghai)
Korea	516	517	524	n/a
New Zealand	513	509	495	520
Slovenia	513	505	510	485
Australia	510	503	494	526
United Kingdom	509	498	492	n/a
Germany	509	509	506	n/a
Netherlands	509	503	512	n/a
Switzerland	506	492	521	n/a
Ireland	503	521	504	n/a
Belgium	502	499	507	541
Denmark	502	500	511	n/a
Poland	501	506	504	510
Portugal	501	498	492	n/a
Norway	498	513	502	n/a
United States	496	497	470	492
Austria	495	485	497	n/a
France	495	499	493	486
Sweden	493	500	494	n/a
Czech Republic	493	487	492	513
Spain	493	496	486	484
Latvia	490	488	482	501
Russia	487	495	494	486
Luxembourg	483	481	486	n/a
Italy	481	485	490	466
Hungary	477	470	477	n/a
Lithuania	475	472	478	n/a
Croatia	475	487	464	480
Argentina	475	475	456	n/a

Country	Science	Reading	Mathematics	Financial Literacy
Iceland	473	482	488	n/a
Israel	467	479	470	476
Malta	465	447	479	n/a
Slovak Republic	461	453	475	470
Greece	455	467	454	n/a
Chile	447	459	423	n/a
Bulgaria	446	432	441	n/a
United Arab Emirates	437	434	427	n/a
Uruguay	435	437	418	n/a
Romania	435	434	444	n/a
Cyprus	433	443	437	n/a
Moldova	428	416	420	n/a
Albania	427	405	413	n/a
Turkey	425	428	420	n/a
Trinidad and Tobago	425	427	417	n/a
Thailand	421	409	415	n/a
Costa Rica	420	427	400	n/a
Qatar	418	402	402	n/a
Colombia	416	425	390	379
Mexico	416	423	408	n/a
Montenegro	411	427	418	n/a
Georgia	411	401	404	n/a
Jordan	409	408	380	n/a
Indonesia	403	397	386	n/a
Brazil	401	407	377	n/a
Peru	397	398	387	n/a
Lebanon	386	347	396	n/a
Tunisia	386	361	367	n/a
FYROM	384	352	371	n/a
Kosovo	378	347	362	n/a
Algeria	376	350	360	n/a
Dominican Republic	332	358	328	n/a

Source: Organisation for Economic Co-operation and Development (OECD) 2016.

Appendix 2. Standard and Poor's Global Financial Literacy Survey results in 2014

Country	Adults who are financially literate (%)	Country	Adults who are financially literate (%)
Afghanistan	14	Ecuador	30
Albania	14	Egypt, Arab Rep.	27
Algeria	33	El Salvador	21
Angola	15	Estonia	54
Argentina	28	Ethiopia	32
Armenia	18	Finland	63
Australia	64	France	52
Austria	53	Gabon	35
Azerbaijan	36	Georgia	30
Bahrain	40	Germany	66
Bangladesh	19	Ghana	32
Belarus	38	Greece	45
Belgium	55	Guatemala	26
Belize	33	Guinea	30
Benin	37	Haiti	18
Bhutan	54	Honduras	23
Bolivia	24	Hong Kong, China	43
Bosnia and Herzegovina	27	Hungary	54
Botswana	52	India	24
Brazil	35	Indonesia	32
Bulgaria	35	Iran, Islamic Rep.	20
Burkina Faso	33	Iraq	27
Burundi	24	Ireland	55
Cambodia	18	Israel	68
Cameroon	38	Italy	37
Canada	68	Jamaica	33
Chad	26	Japan	43
Chile	41	Jordan	24
China	28	Kazakhstan	40
Colombia	32	Kenya	38
Congo, Dem. Rep.	32	Korea, Rep.	33
Congo, Rep.	31	Kosovo	20
Costa Rica	35	Kuwait	44
Côte d'Ivoire	35	Kyrgyz Republic	19
Croatia	44	Latvia	48
Cyprus	35	Lebanon	44
Czech Republic	58	Lithuania	39
Denmark	71	Luxembourg	53
Dominican Republic	35	Macedonia, FYR	21

Country	Adults who are financially literate (%)	Country	Adults who are financially literate (%)
Madagascar	38	Sierra Leone	21
Malawi	35	Singapore	59
Malaysia	36	Slovak Republic	48
Mali	33	Slovenia	44
Malta	44	Somalia	15
Mauritania	33	South Africa	42
Mauritius	39	Spain	49
Mexico	32	Sri Lanka	35
Moldova	27	Sudan	21
Mongolia	41	Sweden	71
Montenegro	48	Switzerland	57
Myanmar	52	Taiwan, China	37
Namibia	27	Tajikistan	17
Nepal	18	Tanzania	40
Netherlands	66	Thailand	27
New Zealand	61	Togo	38
Nicaragua	20	Tunisia	45
Niger	31	Turkey	24
Nigeria	26	Turkmenistan	41
Norway	71	Uganda	34
Pakistan	26	Ukraine	40
Panama	27	United Arab Emirates	38
Peru	28	United Kingdom	67
Philippines	25	United States	57
Poland	42	Uruguay	45
Portugal	26	Uzbekistan	21
Puerto Rico	32	Venezuela, RB	25
Romania	22	Vietnam	24
Russian Federation	38	West Bank and Gaza	25
Rwanda	26	Yemen, Rep.	13
Saudi Arabia	31	Zambia	40
Senegal	40	Zimbabwe	41
Serbia	38		

Source: Standard and Poor's, Gallup Inc., the World Bank Development Research Group and the Global Financial Literacy Excellence Center at the George Washington University 2014.