

"The Assessment of Financial Literacy: the Case of Europe"

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Abstract

The study starts from the definition of financial literacy and its components, to identify the criteria that an assessment methodology should have to properly measure it. In the second part an empirical analysis of the degree of financial literacy of the adult population in several European countries (France, Germany, Italy, the UK, Spain, etc.) is used to highlight similarities and to stress differences between different countries. Results show how the availability of 50 items allows to differentiate the financial literacy of individuals addressing different areas of knowledge (e.g. loans, investments, money management). The use of money (e.g. credit cards, debit cards, cash) is the area of knowledge where individuals seem to be more knowledgeable and confident. On the opposite investment and investment products (e.g. stock, bonds) represent a weak points with average scores to different questions that are dramatically low.

Keywords: Financial literacy, Financial knowledge, Consumer Finance.

1. Introduction

The interest on financial literacy and the awareness about its potential in protecting consumers from doing mistakes or taking wrong financial decisions have grown by the time. Several countries developed national strategies to promote financial literacy by financial education, with the aim to assess the current financial literacy and to plan for initiative devoted to develop well-informed and aware financial consumers. Those efforts from Governments, policy makers, and other institutions (e.g. OECD, World Bank, etc) require reliable measures of financial literacy to estimate a baseline about the degree of knowledge of a certain target (e.g. young, adults, workers, etc.), plan for financial education curricula, and assess the effectiveness of such initiatives.

This paper use a review of the literature to summarizes some reference points about the definition and the measurement of financial literacy, with the aim to show how financial literacy's measures based on a reasonable number of items that take into account different areas of knowledge can provide a more clear understanding about the financial literacy of a population than measures based on just few items.

The paper is organized in two parts. The first one is focused on the definition of financial literacy and its measurement. The second part analyzes data from different European countries to assess the financial literacy of the adult populations.

2. A Definition of Financial Literacy: a Literature Review

The assessment of financial literacy requires a clear definition about what financial literacy means. In one of the first studies on financial literacy Noctor, Stoney and Stradling (1992) refer to financial literacy as "*the ability to make informed judgements and to make effective decisions regarding the use and management of money*". This definition starts from the ability (competence) but makes a step forward pointing out how financial literacy should be related to taking financial decisions. If the word knowledge is not mentioned in this definition, it can be argued that it is included by definition. If knowledge and competence are different concepts a hierarchic connection between them can be stated due to the fact that knowledge represents a sort of pre-requisite to develop competence, meaning for competence the ability to apply knowledge on practical issues as to solve a problem or take a decision. Hence, if it is possible to have knowledge and not be able to apply it (competence), the opposite is not, due to the fact that people can not apply knowledge they do not have. It follows that, including competence, the definition of Noctor et al. (1992) assumes the relevance of knowledge too and includes all the three basic elements of financial literacy: knowledge, competence and the use of money.

Similar definitions, based on the concept of 'ability', were used by Mandell (2008) for which "*financial literacy refers to the ability of consumers to make financial decision in their own best short and long term interest*" and Servon and Kaestner (2008) for which "*Financial literacy refers to a person's ability to understand and make use of financial concepts*". Within this first set of definitions, the one of Noctor et al. (1992) is more close to a concept of financial literacy as a decision making process. This definition was used in several other studies such as Schagen and Lines (1996), Beal and Delpachitra (2003), ANZ (2008), Atkinson and Kempson (2008) and Worthington (2013). In their study Schagen and Lines (1996) tried to figure out which are the abilities related to the 'use of money' that have to be considered, arriving to the conclusion that (1) the understanding of key concepts central to money management and (2) a working knowledge of financial institutions, systems and services are the main abilities to develop in order to be financially literate. Even in Bowen (2003) there is an attempt to specify the skills within the "use of

money". The author talks about financial knowledge *"as the understanding of key financial terms and concepts needed to function daily in American society"*, saying that *"it includes knowledge about items related to banking-checking and savings, auto-life-health and homeowners insurance, using credit, taxes, and investing"*.

Financial literacy as *"the ability to read, analyze, manage and communicate about the personal financial conditions that affect material wellbeing"* is the definition from Vitt et al. (2000).

Referring to 'reading', 'analysing' and 'managing', the authors develop the concept of 'competence' in specific areas, all related with the use of the information. The key role of information as the input of a financial decision making process is quite evident in Mason and Wilson (2000). For these authors financial literacy is *"an individual's ability to obtain, understand and evaluate the relevant information necessary to make decisions with an awareness of the likely financial consequences"*. The words 'ability' and 'understand' recall 'competence' and 'knowledge' even if the need of an access to financial information introduces a new issue and highlight how much knowledge and competences risk to be meaningless in a scenario where information are not available. The same issue is stressed by Johnson and Sherraden (2006) that note how the application of knowledge and competence requires the access to financial information and financial institutions.

The need to analyze financial literacy in a decision making framework - implicit in the definition of Vitt et al. (2000) - is even more clear in Danes and Haberman (2007) where *"financial literacy is the ability to interpret, communicate, compute, develop independent judgment, and take actions resulting from those processes in order to thrive in our complex financial world"*.

If financial literacy should be related to both knowledge and competence, some studies paid more attention to 'knowledge', as Kim (2001) did reporting that *"financial literacy is a basic knowledge that people need in order to survive in a modern society"*. Similarly the FINRA (2003) adopted a definition of financial literacy as *"the understanding [knowledge] ordinary investors have of market principles, instruments, organizations and regulations"*. The NCEE (2005) also addresses a pivotal role of knowledge in its definition of financial literacy as *"familiarity with basic economic principles, knowledge about the U.S. economy, and understanding of some key economic terms"*. Lusardi and Tufano (2009) defined financial literacy as *"familiarity with the most basic economic concepts needed to make sensible saving and investment decisions"* and Almenberg and Widmark (2011) refer to financial literacy as *"familiarity with basic financial concepts and products"*. Again, Lusardi (2008) talks about financial literacy as *"the knowledge of basic financial concepts"*.

Definitions of financial literacy merely shaped around financial knowledge and, on a general base, studies that use financial knowledge as a proxy of financial literacy are typically due to the need to fill the gap between available data - usually on financial knowledge - and the information needed, that involve financial skills and competences too. If the need to cope the lack of data by using financial knowledge for measuring financial literacy is reasonable, a rearrangement of the definition of financial literacy itself that ignores financial abilities and refers simply to financial knowledge is not. Reshaping financial literacy to make it fit with data can have positive effects on the consistency of results in empirical analysis, but risks to extend conclusions from knowledge to competence assuming that a broader knowledge involves broader competence, even when people could be confident in answering to a test about knowledge but not as much confident in taking a financial decision. So, a definition of financial literacy should refer to both knowledge and competence (on financial issues), keeping in mind that financial literacy should be assessed within a financial decision process, even if difficulties in measuring all these aspects can request the use of proxies.

The need to stress the different roles of knowledge and ability in financial literacy is evident in different studies. Moore (2003) highlights how individuals can be considered financially literate if they are competent and can demonstrate they used knowledge they have learned. Huston (2010), in a study that reviewed more than 70 studies, arrived to the conclusion that “*financial literacy consists of both knowledge and application [ability] of human capital specific to personal finance*”. Knowledge and competences are included in a definition as different concepts even by the Jump\$tart Coalition (2007) and the US FLEC - Financial Literacy and Education Commission - (2009) that defined financial literacy as “*the ability to use knowledge and skills [competence] to manage financial resources [money] effectively for a lifetime of financial well-being*”¹. This last definition clearly includes all the three key elements of financial literacy (knowledge, competence and the use of money), matching with the core meaning of these topics. If financial literacy is related with the achievement of financial goals (the 'use of money'), the awareness that different goals requires different financial knowledge and abilities were included in a definition of financial literacy by Remund (2010) that takes into account both the short-term and the long-term perspective of a the decision making process. In his study “*financial literacy is a measure of the degree to which one understand key financial concepts [knowledge] and possesses the ability and confidence to manage personal finances [money] through appropriate, short-term decision-making and sound, long-range financial planning, while mindful of life events and changing economic conditions*”.

¹ The same definition will be used two years later by Hung, Parker and Yoong (2009) and Murphy (2013).

3. The Assessment of Financial Literacy

The assessment of financial literacy concerns the process by which the degree of knowledge and abilities of an individual (or a group of individuals) on a set of financial issues is estimated by items according to some criteria and by the application of a methodology.

Schmeiser and Seligman (2013), in a study on the measurement of financial literacy, highlighted how the measurement of financial literacy is still in its infancy and there is not yet standardized instruments for this. To understand how to measure financial literacy we need to analyze different issues and provide answers to some questions.

The quality of a measure of financial literacy depends on the aim of the measure and its application. Hence, the first issue to take into account is the reason why the measurement is developed. In order to develop a measure of financial literacy we need to know **why the measure is needed and how it will be applied**. When the aim of a study is to provide an overview of financial literacy, stressing how much people know about finance or analyzing if financial literacy is related with some non-financial outcomes (e.g. education, stress, risky behaviors, etc.), the inclusion in the study of a wide range of financial topics is meaningful. The will to take into account different aspects of the financial preparedness of an individual is coherent with the analysis of very different topics belonging to areas as money management, borrowing, saving and investment, insurance, etc. This is reasonable specially when the target of a study is quite large including people that differ each others in terms of financial needs, previous experiences in finance and different social backgrounds. The same measure of financial literacy is no more reliable if applied in a study with the aim to analyze a single behavior on a specific target of recipients. For instance, the topics to be addressed in a study on the role of financial literacy on the use of credit cards within the youths will differ dramatically from a study which goal is to summarize the big picture about financial knowledge on a large population. If credit cards can be used as a payment instrument and/or a borrowing facility, financial literacy should be referred to money management, and borrowing, but not even to insurance, and planning due to the fact these latter topics do not have a logical connection with the object of the study. So, the same measure of financial literacy, referred to the knowledge of different financial areas, well fits in one case (overview of financial literacy) but does not fit anymore in another case (use of credit cards). Of course the opposite is even true, because a measure developed to analyze a specific financial behavior, as the use of credit cards, should not be used to measure financial literacy in general terms, due to the fact that a measure built only on

money management, and borrowing is taking into account only a part of what can be relevant on finance. This approach seems to be coherent with the recommendations provided by the Financial Service Authority in the UK (FSA 2005) about the measuring of financial literacy. In the conclusions of the study it is reported how an overall scale based on knowledge and skills in different financial areas could be inappropriate, supporting the view of measures that should be limited to some selected topics.

About the topics to be taken into account building a measure of financial literacy there is even to think about the **degree of difficulty** tested by the measure, that depends from the aim of the study too. Some studies will request to test more advanced knowledge and abilities, in the meanwhile in other cases just the knowledge of basic financial principles can be enough. On this issue Lusardi (2009), in a study where financial literacy is analysed as a tool for informed consumer choice, highlights how basic concepts are not enough to take a financial decisions. Thinking to a saving and investment decision, it can not be competently made simply applying fundamental financial concepts (that are however essential), but the awareness of the relationship between risk and return, the knowledge about how bonds, stocks, and mutual funds work, and basic asset pricing skills are needed. Again, the need to differentiate within knowledge and abilities is stressed by Huston (2011) that suggests to measure separately knowledge, ability and behaviors and connect the three results by a scoring grid.

If the above mentioned criteria suggest to measure "what is relevant to measure", before thinking about "how to do it", it is useful to set some broad criteria for a scoring system on financial literacy. Results from previous studies² agree that a measure of financial literacy should be **relevant, simple** and **comprehensible**, with the **ability to differentiate** between different people. A measure of financial literacy is relevant if it is bases on issues that show a connection with the needs of financial knowledge of the recipients. It will be simple and comprehensible if it will be possible to explain the outcomes to a non-technical audience, while the ability to differentiate between different people concerns the need to address different scores to people with different knowledge and abilities, in order to permit comparison across people.

Nicolini (2019) reviewed around 80 studies to show how different measures of financial literacy were developed by the time. Results show how almost all the available options to measure financial literacy have been used: self-assessment questions, answers to single questions as self-standing

² FSA (2005), Lusardi and Mitchell (2014), Atkinson and Kempson (2008).

measures of financial literacy, sum of the correct answers to a set of questions or looking at this measures in order to develop indices of financial literacy that discriminate people that correctly answered at least at a certain number of questions or that were able to provide the correct answer to all of them. In the same study there are even evidence about the **topics** taken into account. Almost three on four of the studies (55 on 78) included basic principles as a reference point or as part of a bigger set of topics in the assessment of financial literacy. The **compound interest**, the **risk diversification** and **inflation** are the most frequent topics. The broad areas of application of such general items make them perfectly match with financial literacy measures developed to be applied in studies that try to provide a big picture about financial literacy in a wide population. In most of the cases (41 on 55) these topics represent the only ones used to assess financial literacy, while in the others (14 on 55) they are used with items that can be referred to specific topics (e.g. money management, saving and investment, etc.). When a **specific area of knowledge** has been taken into account, Saving and Investments is the one that received more attention. More than twenty studies included questions on saving and investments (23 on 78). If most of the time this has not been the only area of interest, in some cases (10 on 23) it has been the focus of the analysis or it represented the only topic that has been matched with items on general issues.

4. Financial Literacy in Europe

This section presents the results from an empirical study on the financial literacy in Europe. The first sub-paragraph describes the survey used to collect data of the data and the structure of the questionnaire. The second one presents the results of the survey comparing the degree of financial literacy between different European countries.

4.1 The Data

The data were provided by the Consumer Finance Research Center (CFRC): a research center promoted by a network of academics, with the aim to do research and develop studies on consumer finance by linking together academics, financial authorities, consumers unions and NGOs³. From 2014 to 2018 the CFRC promoted a set of national surveys, targeting the adults population (18+ years old), with the aim to measure the degree of financial literacy in Europe. The survey were replicated in different countries (France, Germany, Italy, Spain, Sweden, the UK) following the same criteria and using the same questionnaire, in order to collect data to be used both for a national

³ For details about the CFRC visit www.consumer-finance.org.

study and an international comparison. The questionnaire was specifically developed to analyze financial literacy and financial behaviors of financial consumers in European countries. The structure and the contents of the questionnaire were released by the experts of the CFRC taking care of previous studies and customizing the questions to make them fit with the peculiarities of the specific country (e.g. financial products and services available, legal framework, features of the welfare system, etc.).

The questionnaire is organized in three sections.

The first section gathers information about the **socio-demographic characteristics** of the respondents. Questions concern the age, gender, education, marital status, income, and other personal information useful to identify the personal profile of the respondent.

The section number two is made by **50 multiple choice questions on financial literacy**. Questions are organized in ten groups of five questions each. Each group analyzes financial knowledge and financial behaviors on a specific area of contents. The ten areas are the following: Interest rates, Inflation, Mortgages, Investments, Bonds, Bank accounts, Payments, Savings and Investments, Loans and Debts, and Retirement and Planning.

For every area, the five questions have been developed following the same principles. Questions are differentiated by the difficulty of the topic. The first two questions are the most easy ones.

Questions 3 and 4 stress more advanced topic, while question 5 is the most difficult. Difficulty is mainly referred to the sophistication of the financial content, while other technical sources of difficulty have been minimized. So, the length of the question (number of words) does not differ so much between questions, the need of mathematical skills has been reduced to the basic operations, and the use of jargon was limited. In that manner the chance that a respondent did not answer right, even being knowledgeable of the content, due to the additional difficulty related to the technicalities of the question should be avoided. The standardization of the test involved even the number of options in each question. With the only exception of the 5 questions frequently used in previous surveys (the so called "Lusardi-Mitchell" questions) - that are part of the questionnaire - all the questions have the same number of options, equal to three. At the same time, two further options are available: the "do not know" and the "prefer not to say" options to avoid the risk to change luck for knowledge. This second section of the questionnaire provides **50 items to be used to build financial literacy measures**. A so generous number of items was intentionally included in the questionnaire in order to have the chance to develop and compare several measures of financial literacy. For instance, (1) a quite comprehensive measure made by the sum of correct answers to all

the 50 questions, (2) a measure that focuses on a specific area of contents and that use only the five questions of a group, or (3) a measure that use only the most difficult questions from each area, are only few of the available options to develop financial literacy scores.

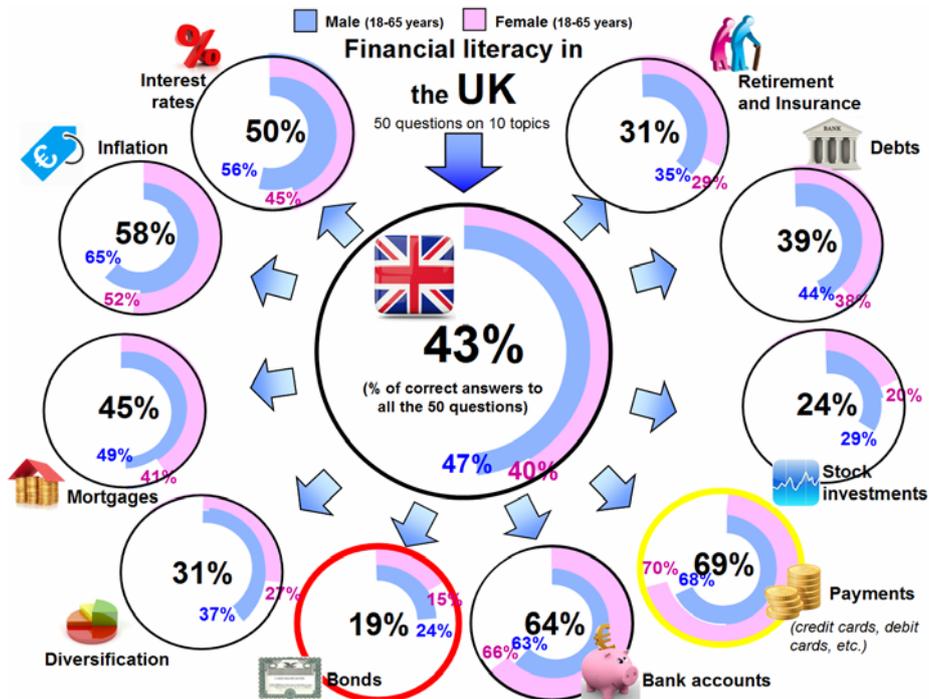
The third section of the questionnaire investigates **financial behaviors and attitudes** on several financial areas. The use of banks accounts, the preferences between difference payments options (e.g. cash, credit cards, etc.) when different options are available, or the preferences for bond or stocks, are few of the financial behaviors discussed in the questionnaire.

4.2 The Degree of Financial Literacy in Europe

The availability of 50 items on financial literacy gives the chance to assess financial literacy much more in details than several previous studies. The 50 items are made by 10 groups of five items each, where the five items differ in term of difficulty. The ten areas of knowledge investigated by those items are Interest rates, Inflation, Mortgages, Diversification, Bonds, Bank accounts, Payments, Stock Investments, Debts, and Retirement and Insurance. The first five areas represent an extension of the so called "big five" questions originally developed by Lusardi and Mitchell and replicated in several surveys. Each of the big five represents the first question of the first five set of questions. In each of them additional four question were added to complete the set. The remaining five sets were chosen to address different areas of knowledge and include both daily decisions (e.g. payments, bank account management) and long term decisions (e.g. Stock investments, Retirement and Insurance). From the 50 items were developed different financial literacy measures. The first one is made by the sum of correct answers to the full set of items, showing a range from zero to fifty. Other ten topic-specific measures counted the number of correct answers to the five questions of each set. In that manner is possible to use a well diversified measure and different specific measures. Moreover is possible to identify for which topic a more severe lack of knowledge exist and which are the areas where individuals are more knowledgeable.

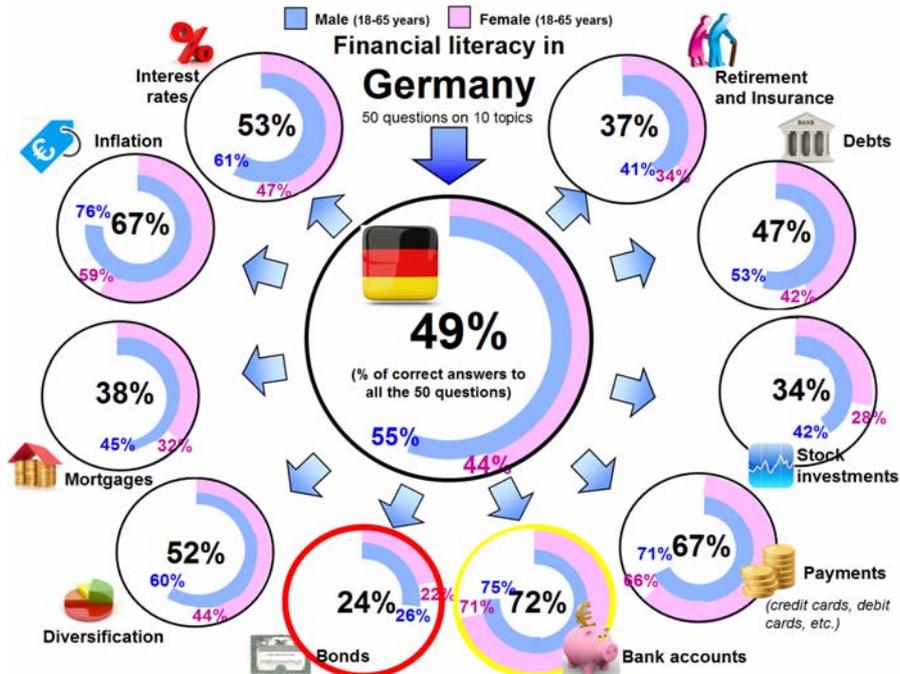
Infographics of the results for the five European countries included in this study (France, Germany, Italy, Spain, Sweden, the UK) are reported in the following pictures.

Figure 1 - Financial literacy in the UK



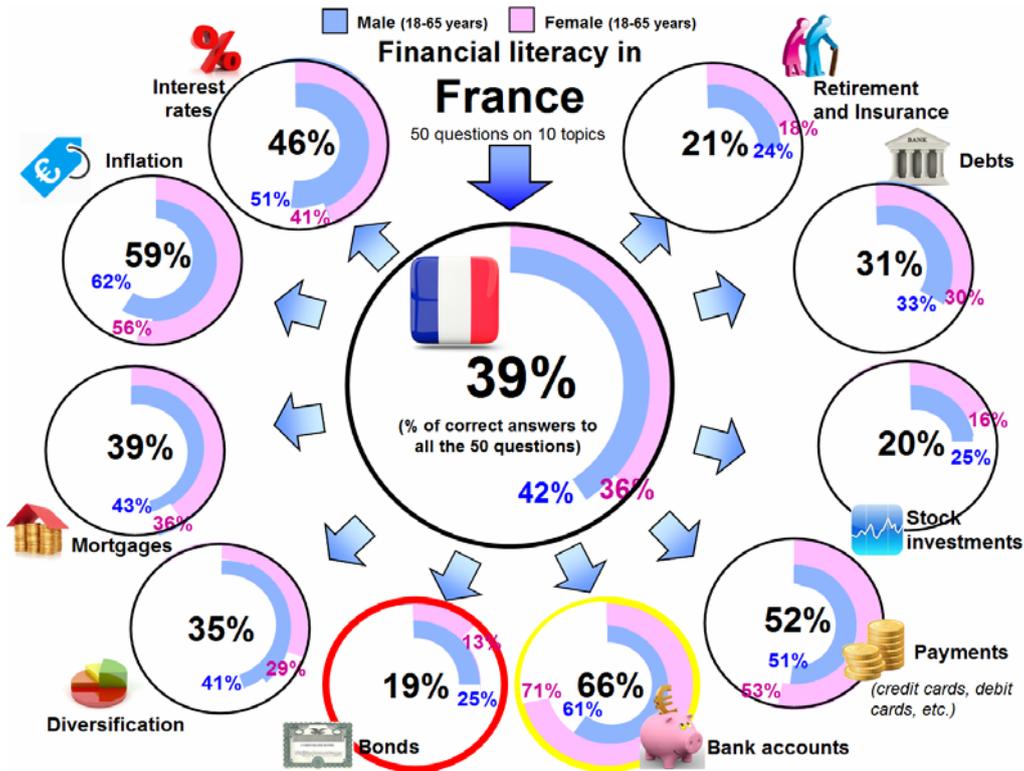
Source: Data from CRFC (2016)

Figure 2 - Financial literacy in Germany



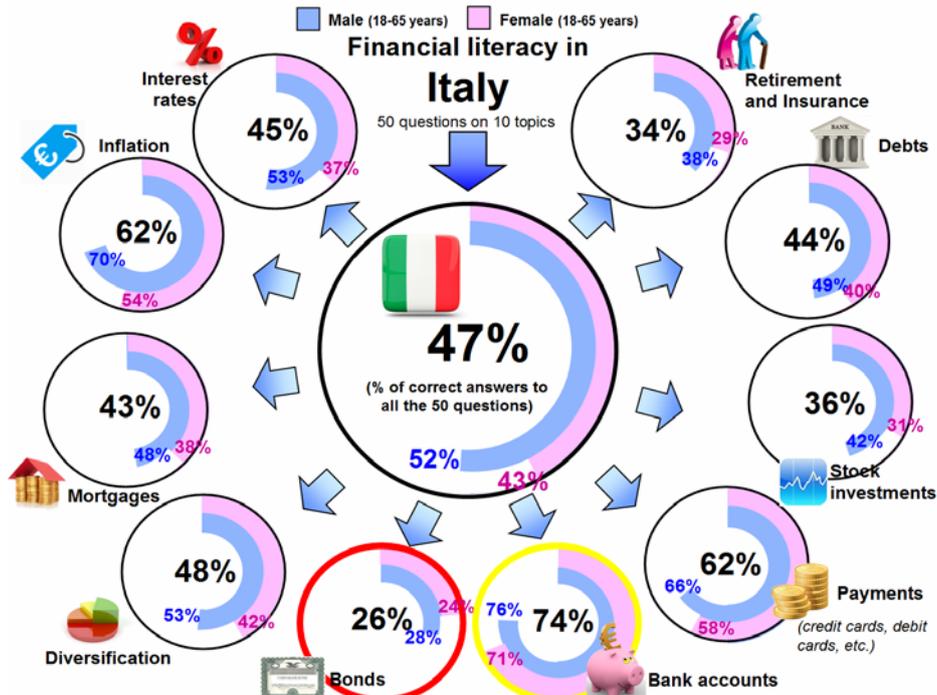
Source: Data from CRFC (2017)

Figure 3 - Financial literacy in France



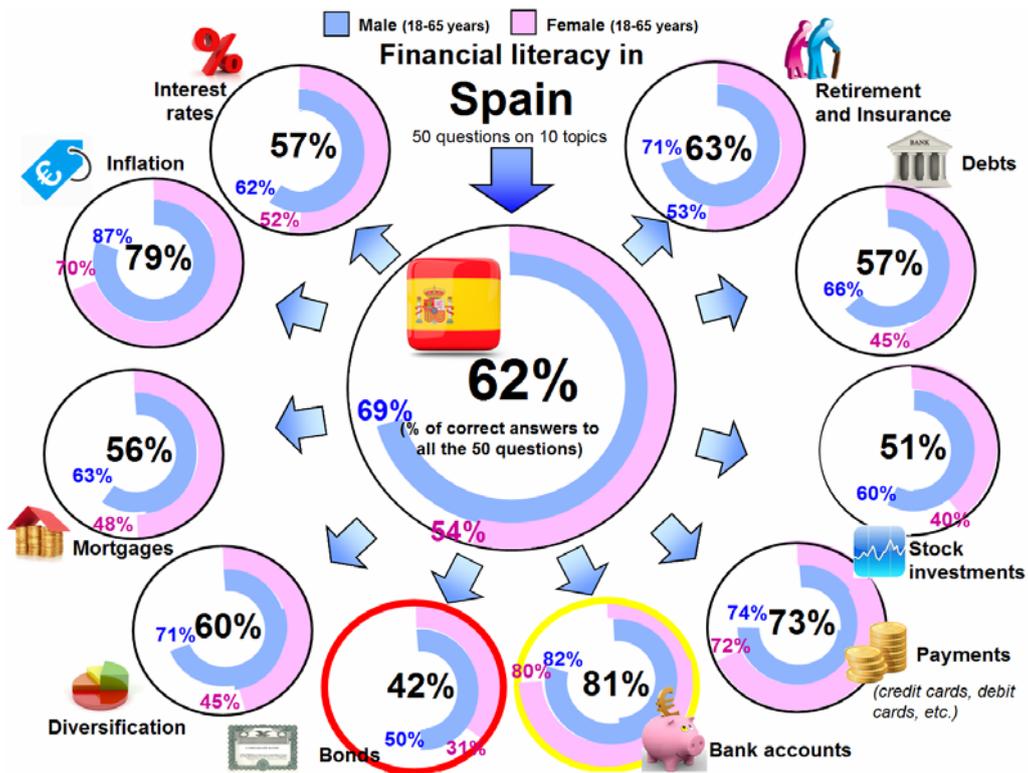
Source: Data from CRFC (2017)

Figure 4 - Financial literacy in Italy



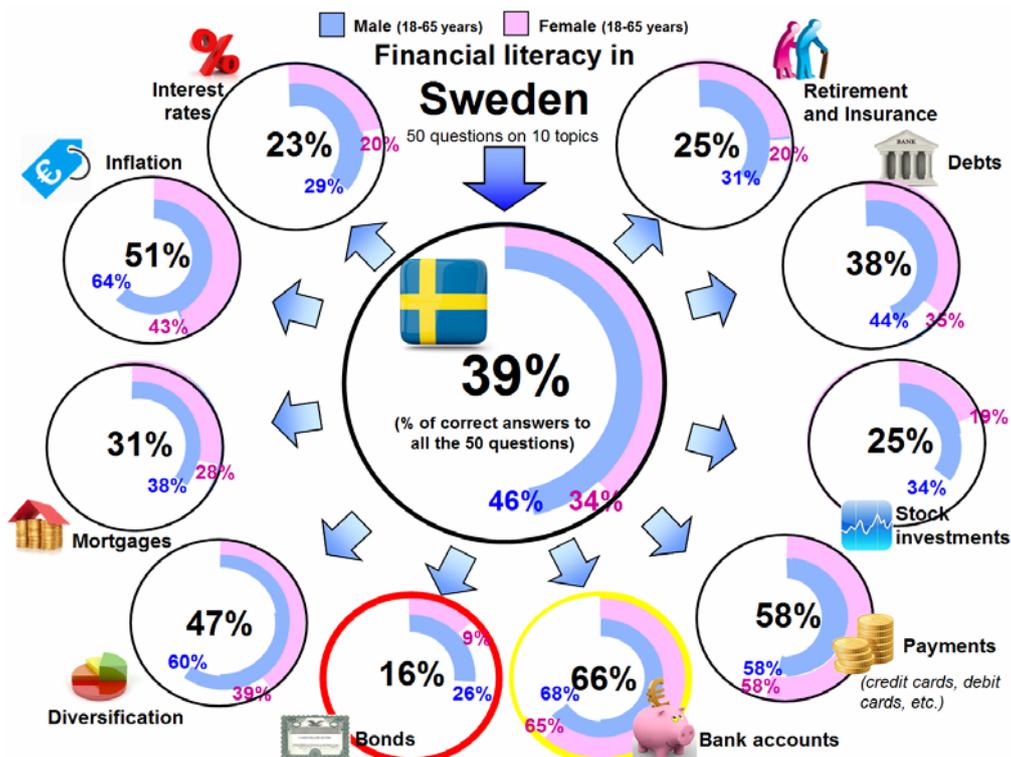
Source: Data from CRFC (2015)

Figure 5 - Financial literacy in Spain



Source: Data from CRFC (2015)

Figure 6 - Financial literacy in Sweden



Source: Data from CRFC (2015)

Looking at the overall score - reported in the centre of each graph and made by the sum of correct answers to all the 50 items - Spain seems to be the most knowledgeable country, but the results from the Spanish sample risk to be misleading due to the small sample size and some other technical issues⁴. Referring to the other five countries Germany is the one with the highest score (49% of correct answers on average) followed by Italy (47%) and the UK (43%). France and Sweden show average scores (39% for both of them) that are 10 points below the German one. Regardless the differences between countries, results are far to be encouraging: on average the European citizen of the sample fail more than half of the questions. However, the hypothesis that each respondents required to be skilled in each of the ten areas of knowledge can not be reasonable. For instance, people without debts should be less knowledgeable about loans just because they have never need to borrow, while people in debt could know less about investments because they do not have saving to be managed. At the same time younger generations can be less informed about pension planning just because they are still dealing with other financial needs and are not planning for future yet. Hence, the breakdown of the overall score into the ten topic-based scores can be more informative and reliable. Looking at the area of knowledge where on average individuals scored the worst, It is clear how knowledge about Bonds is unanimously the most critical area. It represents the area with the lowest score in every country of the sample. In Germany the average percentage of correct answers to the five questions on bonds (24%) is less than 25% (one on four). This result is essentially the same in Italy (26%), while the percentage drops to 19% in France and the UK, reaching a minimum for Sweden (16%). Such a low average score is not limited to bonds, but seems to involve the investment areas generally speaking. Stock investments show results that in some cases are just a bit higher than the knowledge on bonds. The average number of correct answers to the five questions on stocks is 34% in Germany and 36% in Italy, while it is 24% in the UK, 25% in Sweden, and only 20% in France.

On the other side the area of knowledge with the best scores is Bank account on 4 out of the six countries (Italy, France, Spain, and Sweden) and Payments tools for the other two (Germany, and the UK). Such difference between countries is balance by the fact that in countries where knowledge on Bank accounts is the highest, the financial literacy score on knowledge is the second best score, while countries that best perform on Payment tools show the second best result on Bank accounts. The percentages of correct answers to the five questions on Bank accounts or the five

⁴ The average sample size for other countries is 500 observation each. The sample for Spain is made by 148 observations. Moreover the sample over-represents respondents from Barcelona. These two potential biases recommend to do not consider the Spanish sample as much reliable than others and to do not compare results from Spain with results from other countries.

question on Payments tools goes beyond 70% more than once (e.g. Italy-Bank accounts 74%; Germany-Bank accounts 72%) and are systematically greater than 60%.

Looking at other topic-based indices, the Diversification index of financial literacy (based on five question on the diversification of investments) Germany (52%) and Italy (48%) still score pretty high, even if in this case the result from Sweden (47%) is quite near. In the meantime this is an area of knowledge quite critical in the UK (31%) and France (35). The need to address financial literacy looking at specific domains of knowledge is evident switching from the Diversification index to the Mortgage index. In this case the Britons are the most knowledgeable on average (45%) scoring better than Italy (43%), France (39%) and Germany (38%).

Knowledge on Retirement and Insurance is another area of knowledge where financial literacy seems to be quite low. Results from Germany are still the best, but the average number of correct answers to the five questions of this areas are below 40% anyway (Germany 37%). The scenario is not positive even in Italy (34%) and the UK (31%) but becomes even more negative in Sweden (25%) and France (21%). For the latter two countries, the presence of a strong and efficient welfare system can (partially) explains why people in Sweden tend to know less than others about retirements, assuming that they do not need to play an active role in planning their retirement age, while the lack of knowledge about retirements and insurance is not explained by similar circumstance for France.

A final comment about the financial literacy in Europe concerns the "**gender gap**". Such phenomenon is not new and there are a lot of studies from different countries around the world that show how on average female tend to be less knowledgeable than male about finance. Unfortunately this result is confirmed by all the cases of this study. On the overall score as in the topic-based score, female score on average less then male in every area of knowledge an in every country. If sometimes the gap is very small (e.g. France-Debt: Male 32% Vs Female 30%; Spain-Payments: Male 74% Vs Female 72%) in other cases can be wider than 10 percentage points (e.g. Sweden-Bonds: Male 26% Vs Female 9%; Italy-Inflation: Male 70% Vs Female 54%). There are few exceptions - that could be referred as a "reverse gender gap"- with female than score on average better than male. It happens in France (Payments: Male 51% Vs Female 53%; Bank accounts: Male 61% Vs Female 71%) and the UK (Payments: Male 68% Vs Female 70%; Bank accounts: Male 63% Vs Female 66%). Such results suggest how female tend to develop comparable degree of financial knowledge when knowledge is related with products and services used in an iterative

manners (e.g. credit cards, bank accounts, etc.) where probably a learning by doing effect is possible. Of course further investigation are required to achieve final conclusions. However it is interesting how results from previous studies did not show any example of "reverse gender gap". Such result supports the hypothesis that an assessment of financial literacy based on a small number of items risk to be misleading or not able to provide the right interpretation of a complex phenomenon.

5. Conclusions

This paper investigated the financial literacy in Europe using data from different European countries. The available definitions of financial literacy stress the need to address financial knowledge, financial skills, and financial attitude to measure financial literacy. In the meantime a measure that relies only on financial knowledge is not by definition incomplete. The lack of knowledge risen from the empirical analysis in Europe can be considered the evidence of a lack of financial literacy, due to the fact that financial skills represent the ability to apply financial knowledge in order to take a financial decision. If people can not apply knowledge they do not have, a low degree of financial knowledge can be interpreted as a low degree of financial literacy. Of course, in case of a fully knowledgeable population the assumption that such population is also financial literate could fail if such knowledge is not properly applied in taking a financial decisions (e.g. lack of financial skills or financial attitude).

The availability of rich data from different national surveys allowed to assess the financial literacy much more in details than other studies. If on average people failed more than fifty percent of the questions, the analysis of results focused on single areas of knowledge shows that there are some topics - such payments tools and the management of bank account - where individuals tend to score much better than others, while investments related topics (e.g. bonds, stocks, diversification) are the ones where the average score decrease to minimum levels. Results confirm the existence of a "gender gap", with female respondents that tend to score lower than males in every country. If this result confirms evidence from different previous studies, the analysis of single areas of contents show how that gender gap is much smaller or disappear in certain domains (e.g. payments tools and bank accounts), up to reverse the gap in some cases.

Results from this study strongly support the hypothesis that a reliable measure of financial literacy can not be based on a small number of items. That is particularly true when a financial literacy measure is used to assess the effectiveness of financial education curricula or other initiatives devoted to increase consumers' financial literacy.

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Appendix

CFCR data - Descriptive statistics

| UK | | |
|-------------------------|------------|-------------|
| | # | % |
| Age | | |
| 18-24 | 107 | 17.70% |
| 25-30 | 90 | 14.90% |
| 31-35 | 71 | 11.70% |
| 36-40 | 60 | 9.90% |
| 41-45 | 42 | 6.90% |
| 46-50 | 48 | 7.90% |
| 51-55 | 55 | 9.10% |
| 56-60 | 42 | 6.90% |
| 60-65 | 32 | 5.30% |
| 65+ | 58 | 9.60% |
| Gender | | |
| Male | 280 | 46.10% |
| Female | 316 | 52.10% |
| n.a. | 11 | 1.80% |
| Income (Monthly) | | |
| < £500 | 94 | 14.00% |
| £500 <£750 | 64 | 9.50% |
| £750 <£1,000 | 57 | 8.50% |
| £1,000 < £1,500 | 103 | 15.30% |
| £1,500 < £2,000 | 74 | 11.00% |
| £2,000 <£3,000 | 86 | 12.80% |
| £3,000 < £4,000 | 35 | 5.20% |
| > £4,000 | 28 | 4.20% |
| n.a. | 66 | 9.80% |
| Total | 607 | 100% |

| Germany | | |
|-------------------------|------------|-------------|
| | # | % |
| Age | | |
| 18-24 | 48 | 9.10% |
| 25-30 | 74 | 14.00% |
| 31-35 | 64 | 12.10% |
| 36-40 | 46 | 8.70% |
| 41-45 | 30 | 5.70% |
| 46-50 | 35 | 6.60% |
| 51-55 | 47 | 8.90% |
| 56-60 | 31 | 5.90% |
| 60-65 | 44 | 8.30% |
| 65+ | 110 | 20.80% |
| Gender | | |
| Male | 244 | 45.80% |
| Female | 275 | 51.60% |
| n.a. | 14 | 2.60% |
| Income (Monthly) | | |
| < €500 | 47 | 8.40% |
| €500 <€750 | 29 | 5.20% |
| €750 <€1,000 | 84 | 14.90% |
| €1,000 < €1,500 | 104 | 18.50% |
| €1,500 < €2,000 | 70 | 12.50% |
| €2,000 <€3,000 | 28 | 5.00% |
| €3,000 < €4,000 | 118 | 21.00% |
| > €4,000 | 24 | 4.30% |
| n.a. | 29 | 5.20% |
| Total | 533 | 100% |

| France | | |
|-------------------------|------------|-------------|
| | # | % |
| Age | | |
| 18-24 | 67 | 13.00% |
| 25-30 | 64 | 12.40% |
| 31-35 | 43 | 8.30% |
| 36-40 | 53 | 10.30% |
| 41-45 | 50 | 9.70% |
| 46-50 | 33 | 6.40% |
| 51-55 | 44 | 8.50% |
| 56-60 | 33 | 6.40% |
| 60-65 | 46 | 8.90% |
| 65+ | 84 | 16.20% |
| Gender | | |
| Male | 243 | 47.00% |
| Female | 263 | 50.90% |
| n.a. | 11 | 2.10% |
| Income (Monthly) | | |
| < €500 | 48 | 9.10% |
| €500 <€750 | 45 | 8.50% |
| €750 <€1,000 | 67 | 12.60% |
| €1,000 < €1,500 | 126 | 23.80% |
| €1,500 < €2,000 | 86 | 16.20% |
| €2,000 <€3,000 | 74 | 14.00% |
| €3,000 < €4,000 | 44 | 8.30% |
| > €4,000 | 18 | 3.40% |
| n.a. | 11 | 2.10% |
| Total | 519 | 100% |

| Italy | | |
|-------------------------|------------|-------------|
| | # | % |
| Age | | |
| 18-24 | 49 | 9.70% |
| 25-30 | 45 | 8.90% |
| 31-35 | 43 | 8.50% |
| 36-40 | 49 | 9.70% |
| 41-45 | 55 | 10.90% |
| 46-50 | 56 | 11.10% |
| 51-55 | 51 | 10.10% |
| 56-60 | 50 | 9.90% |
| 60-65 | 41 | 8.20% |
| 65+ | 64 | 12.70% |
| Gender | | |
| 1 - Male | 247 | 49.20% |
| 0 - Female | 255 | 50.80% |
| n.a. | 0 | 0.00% |
| Income (Monthly) | | |
| < €500 | 65 | 12.90% |
| €500 <€750 | 25 | 5.00% |
| €750 <€1,000 | 42 | 8.30% |
| €1,000 < €1,500 | 108 | 21.50% |
| €1,500 < €2,000 | 84 | 16.70% |
| €2,000 <€3,000 | 65 | 12.90% |
| €3,000 < €4,000 | 1 | 0.20% |
| > €4,000 | 39 | 7.80% |
| n.a. | 74 | 14.70% |
| Total | 503 | 100% |

| Spain | | |
|-----------------|------------|-------------|
| | # | % |
| Age | | |
| 18-24 | 8 | 5.40% |
| 25-30 | 10 | 6.80% |
| 31-35 | 23 | 15.60% |
| 36-40 | 26 | 17.70% |
| 41-45 | 19 | 12.90% |
| 46-50 | 8 | 5.40% |
| 51-55 | 19 | 12.90% |
| 56-60 | 11 | 7.50% |
| 60-65 | 11 | 7.50% |
| 65+ | 12 | 8.20% |
| Gender | | |
| Male | 85 | 57.40% |
| Female | 62 | 41.90% |
| n.a. | 1 | 0.70% |
| Income | | |
| < €500 | 14 | 9.50% |
| €500 <€750 | 4 | 1.40% |
| €750 <€1,000 | 9 | 3.00% |
| €1,000 < €1,500 | 29 | 9.80% |
| €1,500 < €2,000 | 29 | 9.80% |
| €2,000 <€3,000 | 35 | 11.80% |
| €3,000 < €4,000 | 16 | 5.40% |
| > €4,000 | 4 | 1.40% |
| n.a. | 8 | 2.70% |
| Total | 148 | 100% |

| Sweden | | |
|--------------------------|------------|-------------|
| | # | % |
| Age | | |
| 18-24 | 90 | 14.80% |
| 25-30 | 85 | 14.00% |
| 31-35 | 71 | 11.70% |
| 36-40 | 59 | 9.70% |
| 41-45 | 72 | 11.80% |
| 46-50 | 68 | 11.20% |
| 51-55 | 71 | 11.70% |
| 56-60 | 43 | 7.10% |
| 60-65 | 45 | 7.40% |
| 65+ | 4 | 0.70% |
| Gender | | |
| Male | 269 | 44.20% |
| Female | 305 | 50.10% |
| n.a. | 35 | 5.70% |
| Income (Monthly)* | | |
| <8,000 SEK | 89 | 14.00% |
| 8,000 <15,000 SEK | 68 | 10.70% |
| 8,000 <15,000 SEK | 42 | 6.60% |
| 15,000 < 22,000 SEK | 83 | 13.10% |
| 22,000 <30,000 SEK | 131 | 20.60% |
| 30,000 <38,000 SEK | 84 | 13.20% |
| 38,000 <45,000 SEK | 19 | 3.00% |
| >45,000 SEK | 25 | 4.00% |
| n.a. | 95 | 14.90% |
| Total | 636 | 100% |

* 1 SEK ("Swedish Krona") = 0.104876 EUR
(10,000 SEK = 1,048.76 EUR)
Source: <http://www.x-rates.com>
(Exchange rate on Friday, October 6th 2017)

THE ROLE OF FINTECH DEVELOPMENT IN FINANCIAL INCLUSION IN ASIAN COUNTRIES¹

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ABSTRACT

Fintech which is abbreviation for financial technology, is an industry that uses technology to provide financial services and make financial systems more efficient. Fintech plays an important role in improving access to financial services for all, at the same time, promoting financial inclusion. Financial inclusion represent for availability of financial system which is straightforward to access to useful financial products and services by everyone at reasonable prices. The study examined the relationship between Fintech development and financial inclusion in 45 Asian countries. Using the GMM regression technique, the paper confirms the correlation between Fintech development and financial inclusion through the enhancement of Fintech infrastructure and Fintech ecosystems to facilitate improve financial inclusion.

Keywords: *Fintech, Fintech development, financial inclusion, Asia*

INTRODUCTION

In the context of the boom of the 4.0 Industrial Revolution with the strong development of high technology, this is a strategic time for banks to apply the digital transformation to improve their performance to serve individual, industries and public services while increasing the chances of financial inclusion for the majority of the population. According to data from the World Bank, estimated from 2011 to 2014, the proportion of people using formal financial services reached nearly 60%. Increasing income per capita requires financial services provided for individuals with better quality and reduce cost. Digital finance has been acknowledged by international as a comprehensive means to promote financial inclusion by reducing the cost of providing financial services (Wyman, 2017). The expansion of digital payment platforms has created opportunities for connecting the poor with financial products suppliers such as savings, credit, and insurance (Radcliffe and Voorhies, 2012). On the basis of financial inclusion, financial inclusion will no longer be universal but also being the connection by affordable devices such as a smartphone, wearable device and through all radio signals to provide financial services as fast as possible (FST Media, 2015). This is challenging and opportunities for financial inclusion through the creation and integration of technology into social networks and cost reduction (Lee and Teo, 2015).

Financial inclusion is an issue promoted by countries all over the world, especially developing countries to promote economic growth. According to Word Bank, financial inclusion means individuals and businesses have access to useful financial products and services at reasonable prices, meeting their needs - transactions, payments, savings, credit, and insurance - done in a responsible and sustainable way. Nowadays, accessing to the financial services is easier and faster by technology, especially, Fintech is the key solution for financial inclusion. The more technology has been developing, the more Fintech becomes important. Fintech has become a top concern of scholars, planners, banks and institutions to exploit the ability to provide new creative solutions for promoting financial inclusion. Fintech is an acronym for financial technology, Fintech is an industry that uses technology to make smart financial systems and provide financial services more efficient. It is estimated that more than 1.7³ billion adults cannot access financial services. Fintech has played an increasingly important role in reshaping today's financial and

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³ <https://globalfindex.worldbank.org/>

banking landscape. This is an initiative to promote financial inclusion for those who are difficult to access financial services or do not use financial services. Therefore, Fintech is considered as a driving force for promoting financial inclusion in many countries. The findings in the study will be of great value to policymakers by development strategies of Fintech and the current importance of Fintech with the promotion of financial inclusion faster and cost savings. Governments and international organizations are pursuing support of Fintech initiatives to promote financial inclusion in recent years, which is given priority to both developed countries and developing countries in particular. Fintech has significantly reduced costs by providing services through innovative but simple ways⁴.

LITERATURE REVIEW

Financial inclusion is becoming highly important for a much number of countries worldwide, especially Asia, a growing literature has been evaluating its measurements, determinants, and effects. According to the research of Michelle (2014), the analysis shows that financial inclusion includes financial innovations, access to financial services, intermediary efficiency and financial literacy. Achieving financial inclusion requires narrowing the cash gap and digital payments (Dayadhar, 2015). In addition, connecting customers to the digital payment system through instant money transfer at a low cost (Radcliffe and Voorhies, 2012). The relationship between financial technology and financial popularity begins with a large number of people being denied financial services, who own mobile phones and want to be provided services. Mobile finance and related equipment can improve the main accessibility for this audience (World Bank, 2016). Research by Kim et al (2016) analyzed the acceptance of Fintech's services based on the feasible calculation model of Petty and Cacioppo and the model of TAM technology adoption, concern about information security CFIP. The study investigates the relationship between central and peripheral routes in accepting new technologies and services to determine the acceptance of Fintech for financial inclusion. Research by Ryoji Kashiwagi (2016) suggests that the more you search for information technologies like mobile phones to quickly and widely provide financial services at low cost, in other words, Fintech is a key for financial inclusion. Leong et al (2017) mentioned financial technology, or Fintech, affecting financial institutions, regulatory agencies, customers, and traders across many industries. Innovation especially technology has become potential finance revolution by making it more inclusive, decentralized and egalitarian (Jame Guild, 2017). Ozili's research (2018) discusses digital finance and its implications for financial inclusion and financial stability. Digital finance through Fintech has a positive impact on financial dissemination in emerging and advanced economies, and the convenience that digital finance provides to individuals has low and variable income is often more valuable than higher costs that will pay to get such services from conventional regulated banks than higher costs that will pay to get such services from conventional regulated banks. In digital age, Fintech which is one of player in financial revolution, are taking emergence of "for-profit, mission-driven" to drive through greater financial inclusion (Anju Patwardhan et al, 2018).

Factors affecting financial inclusion include financial innovations, access to financial services, effective intermediaries and financial literacy (Michelle, 2016). Digital finance which has substantial effects to financial inclusion, includes internet banking, mobile banking, wallets, credit card and debit card (Durai and Stella, 2019). A large number of the population has difficulty accessing financial services that own mobile phones and the provision of financial services through mobile phones and related devices can improve access to main financial resources for this object (Sethy, 2016). High costs are one of the reasons that prevent customers from receiving the products or services they need, especially those with poor financial backgrounds, will be excluded from financial services. Fintech has significantly reduced costs by providing services through innovative but simple ways⁵. Digital finance has been viewed internationally as a means of providing adequate opportunities to promote financial dissemination through reduced costs of providing financial services (ADB, 2016). Improve financial inclusion through digital inclusion (ING,

⁴ KPMG, Value of Fintech, 2017, <https://assets.kpmg.com/content/dam/kpmg/uk/pdf/2017/10/value-of-Fintech.pdf>

⁵ KPMG, Value of Fintech, 2017, <https://assets.kpmg.com/content/dam/kpmg/uk/pdf/2017/10/value-of-Fintech.pdf>

2016). The study of Francis Agyekum et al (2016) examined the relationship between increased access to digital financial services (DFS) and financial dissemination in low-income countries. Digital finance through Fintech startup significantly influences to financial inclusion in emerging and advanced economies, the advantage of Fintech when providing financial services to individuals with low and variable income is often more valuable to similar services of traditional bank (Ozili, 2018).

The study results show a positive trend of mobile phone use and negative trends of bank DFS facilities in the period of 2011 to 2014 in Ghana and the enhancement of technology will stimulate linkages positive results in financial inclusion.

Research topic "The impact of Fintech development on financial inclusion: The case of Asian countries" systematizes the theory of Fintech and financial inclusion from 2000s to current, assessing the status now of Fintech and financial inclusion. Since then, the topic analyzes the relationship and influence between Fintech development and financial inclusion by running a quantitative model. Through research results, the article provides recommendations for planners and Fintech companies to facilitate Fintech to develop and promote financial inclusion.

DATA AND METHODOLOGY

As an empirical study, the goal of this research is to find out the role of Fintech in financial inclusion in Asian countries.

Variables

Hypotheticals:

H0_0: The development of Fintech does not impact to financial inclusion.

H1_0: Fintech development impacts to financial inclusion.

Table 1: Summary of variables and hypotheses

| No. | Factor | Variables | Hypothetical impact (ACC) | Hypothetical impact (ATM) | Hypothetical impact (CRED) |
|-----|---|--------------|---------------------------|---------------------------|----------------------------|
| 1 | The number of bank accounts per 1000 adults | $ACC_{i,t}$ | | | |
| 2 | The number of ATMs per 100,000 adults | $ATM_{i,t}$ | | | |
| 3 | Total private domestic credit over GDP | $CRED_{i,t}$ | | | |
| 4 | Mobile subscriptions density | $MOBI_{i,t}$ | Positive | Positive | Positive |
| 5 | Internet density | $INT_{i,t}$ | Positive | Positive | Positive |
| 6 | Electricity coverage | $ELEC_{i,t}$ | Positive | Positive | Positive |
| 7 | Start-up attractiveness | $STA_{i,t}$ | Negative | Negative | Negative |
| 8 | Innovation | $INNO_{i,t}$ | Negative | Negative | Positive |

Source: Summarize by the author

Dependent variables

In the paper, in order to assess the impact of Fintech development on financial inclusion, the study will use financial inclusion indicators based on research by Sarma and Sethy (Sarma, 2008; Sarma, 2012; Sethy, 2016): Number of bank accounts per 1000 adults ($ACC_{i,t}$); The number of ATMs per 100,000 adults ($ATM_{i,t}$) is based on some of the above studies used. In addition, the study will use additional indicators as a dependent variable to clarify the financial inclusion as possible. That is: Total private domestic credit over GDP (%) ($CRED_{i,t}$) (Okoye et al., 2017). The data used in this study includes 40 countries in Asia in period from 2010 to 2017.

Independent variables

With the index given by ING's research, the study selected the variables divided by two sub-indices: Fintech infrastructure and Fintech ecosystem. The Fintech infrastructure indicators reflect prerequisite conditions for Fintech develops. This section consists of 3 representative data variables: Mobile subscription density which reflects subscriptions per 100 inhabitants ($MOBI_{i,t}$), Electricity coverage which reflects share of population connected to the electricity grid ($ELEC_{i,t}$) and the percentage of the population in the internet network ($INT_{i,t}$). Through mobile phone coverage and the Internet is an essential opportunity to promote financial inclusion. Kpodar and Andrianaivo (2011b) also found a correlation between the financial inclusion and the penetration of mobile phones. They found that the penetration of mobile phones strengthens the process of credit allocation, leading to wider financial inclusion in the financial system. The research of Francis Agyekum et al (2016) also shows the positive impact of ICTs including the number of mobile and Internet subscribers to financial inclusion. Therefore, in the Fintech index system, the study selected 3 variables in the sub-index Fintech infrastructure is the density of mobile subscribers, the percentage of internet users and the percentage of the population accessing the electricity network to represent Fintech infrastructure is ready to serve financial technology services. Research of World Bank (2016) implies that mobile phones connected to the Internet are affordable for digital technology finance which is best way for financial exclusion person.

Fintech ecosystem evaluates the business environment of countries for Fintech companies. The Start-up attractiveness represented by the time of starting a business is a representative of a nation's Fintech investment ecosystem ($STA_{i,t}$). At the same time, Innovation index reflect the comprehensive development for a Fintech ecosystem ($INNO_{i,t}$). In the sub-index of Fintech ecosystem, Start-up attractiveness variable is an indication of the ease of setting up a startup company through the start-up time to demonstrate the development base for a Fintech startup. According to experience of Kama and Adigun (2013) on financial inclusion in Nigeria, challenges and experiences of other jurisdictions show that there is a lack and waste of innovative based on related, has limited the completion of an important extension of the level of budget matching in Nigeria. In addition, innovation index is an important platform for Fintech.

Data and Methodology

The dataset includes in this study includes 40 countries in Asia from 2010 to 2017.

Table 2: Descriptive data

| Variables | Number of observations | Mean | Std. Error | 95% Confidence Interval | |
|------------------------------|------------------------|----------|------------|-------------------------|-------------|
| | | | | Lower Bound | Upper Bound |
| Country | | | | | |
| Year | 320 | 2013.5 | 2.294876 | 2010 | 2017 |
| Independent Variables | | | | | |
| ACC | 200 | 1053.63 | 1235.626 | 10.2454 | 8114.603 |
| ATM | 320 | 50.9127 | 50.56411 | .0913772 | 288.6319 |
| CRED | 312 | 65.8101 | 48.48711 | 4.645404 | 253.2622 |
| Dependent Variables | | | | | |
| MOBI | 320 | 111.1021 | 35.70623 | 1.184307 | 214.7349 |
| INT | 320 | 45.66378 | 26.62387 | .25 | 99.4 |
| ELEC | 320 | 92.84814 | 13.70016 | 31.1 | 100 |
| STA | 320 | 25.84716 | 28.46019 | 2 | 187 |
| INNO | 320 | 35.65812 | 10.52678 | 4.6 | 66.42857 |

The research will focus on answering the questions:

Question 1: Does Fintech development affect financial inclusion and how does it affect Asia? How is the level of that impact?

The hypothesis of the study:

Regression analysis model: From the assumption above, the research proposes a 6 variable linear regression model to evaluate the impact of Fintech development to financial inclusion.

The regression equation takes the following form:

$$ACC_{i,t} = \alpha ACC_{i,t-1} + \beta_1 MOBI_{i,t} + \beta_2 INT_{i,t} + \beta_3 ELEC_{i,t} + \beta_4 STA_{i,t} + \beta_5 INNO_{i,t} + e_{i,t} \quad (1)$$

$$ATM_{i,t} = \alpha ATM_{i,t-1} + \beta_1 MOBI_{i,t} + \beta_2 INT_{i,t} + \beta_3 ELEC_{i,t} + \beta_4 STA_{i,t} + \beta_5 INNO_{i,t} + e_{i,t} \quad (2)$$

$$CRED_{i,t} = \alpha CRED_{i,t-1} + \beta_1 MOBI_{i,t} + \beta_2 INT_{i,t} + \beta_3 ELEC_{i,t} + \beta_4 STA_{i,t} + \beta_5 INNO_{i,t} + e_{i,t} \quad (3)$$

(In particular, the index i represents each country, index t represents the year of observation.)

FINDINGS

For dynamic estimation models according to GMM, Sargasn's test results accept the hypothesis H0, the instruments used are reasonable. Testing of correlation also shows that there is no second-order correlation. Therefore, it can be confirmed that the use of GMM is appropriate. Results in dynamic models differ significantly from those in static models. When the study only stops at the static model, the conclusions can be skewed both in terms of impact and significance.

Dynamic and static models only have similar conclusions about the impact of the percentage of Internet users (INT) affecting the number of accounts. Meanwhile, the dynamic model further analyzes the impact of innovation index on number of ATMs and total domestic credit.

GMM method for dynamic panel data using the appropriate delay of instrumented variables. This is a dynamic panel data model with time parameters, country and delay variables. In addition, it also exploits the combined data of the table and does not bind the time series of table units in Panel Data. This allows the use of an appropriate structure to exploit the dynamics of data.

Comparing the results of two static models OLS, REM, FEM, and GMM dynamic model showed the difference in results, combining the analysis of the optimization of each method, this study selected dynamic estimation model GMM is the most optimal model for analyzing experimental results. Preliminary evaluation of the influence of Fintech on the financial inclusion performance is shown in Table 3.

Previous researches showed that the impact of Fintech on financial inclusion within conceptual and micro-based. Results are similar to those of other studies in Africa.

The regression results show that the variables INT is statistically significant only in the model of ACC and STA is statistically significant in the model of ATM and CRED. With 99% reliability, the model obtained is statistically significant, accepting the initial hypothesis that the research is given is the percentage of population accessing internet affects to the number of bank accounts; Start-up attractiveness affects total domestic credit. With 95% reliability, the model accepts the assumption that start-up attractiveness affects ATMs; accept hypothesis: the proportion of population accessing to internet has positive impact to number of bank accounts, start-up attractiveness have negative impact to ATMs and positive impact to total domestic credit. The model demonstrates the impact of Fintech development on financial inclusion by explaining the phenomenon of research.

Table 4: Regression Result for ACC variable

| | Static model | | | Dynamic model |
|---------------|--------------|-------------|-------------|---------------|
| | OLS | REM | FEM | GMM |
| $ACC_{i,t-1}$ | | | | -0.281488 |
| $MOBI_{i,t}$ | -2.477135 | -2.477135 | -5.295503 | -15.8485 |
| $INT_{i,t}$ | 22.76353*** | 22.76353*** | 31.01652*** | 64.77471*** |
| $ELEC_{i,t}$ | 8.321913 | 8.321913 | 33.39664 | -45.77882 |

| | | | | |
|----------------------|-----------|-----------|-----------|-----------|
| $STA_{i,t}$ | -1.786465 | -1.786465 | -.3245158 | -11.17941 |
| $INNO_{i,t}$ | -15.29103 | -15.29103 | -4.015273 | 25.23137 |
| LM | | 62.06*** | | |
| Wald (χ^2) | | | | |
| Hausman (χ^2) | | 6.89*** | | |
| Sargan | | | | 3.09*** |
| AR (1) | | | | -0.77*** |
| AR (2) | | | | -0.84*** |

Notes: Confidence Interval *** 1%, ** 5%, * 10%

Source: Summarize by the author

Table 5: Regression Result for ATM variable

| | Static model | | | Dynamic model |
|----------------------|--------------|-------------|------------|---------------|
| | OLS | REM | FEM | GMM |
| $ATM_{i,t-1}$ | | | | .7509137 |
| $MOBI_{i,t}$ | .0904459** | .0904459** | .0889689** | .0369453 |
| $INT_{i,t}$ | .5422845*** | .5422845*** | .508058*** | .0294385 |
| $ELEC_{i,t}$ | .1459694 | .1459694 | .1031551 | .3291749 |
| $STA_{i,t}$ | .0969495** | .0969495** | .0976765** | .0911645 |
| $INNO_{i,t}$ | .3650869*** | .3650869*** | .2437693* | -.5530849** |
| LM | | 933.17*** | | |
| Wald (χ^2) | | | | |
| Hausman (χ^2) | | 10.30*** | | |
| Sargan | | | | 2.28*** |
| AR(1) | | | | -2.87*** |
| AR (2) | | | | 0.36*** |

Notes: Confidence Interval *** 1%, ** 5%, * 10%

Source: Summarize by the author

Table 6: Regression Result for CRED variable

| | Static model | | | Dynamic model |
|----------------------|--------------|-------------|-------------|---------------|
| | OLS | REM | FEM | GMM |
| $CRED_{i,t-1}$ | | | | .8008333 |
| $MOBI_{i,t}$ | .0336384 | .0336384 | .0321176 | .1682729 |
| $INT_{i,t}$ | .5336962*** | .5336962*** | .5102129*** | -.5495797 |
| $ELEC_{i,t}$ | .200124 | .200124 | .1858849 | .3516856 |
| $STA_{i,t}$ | .009168 | .009168 | .0104296 | -.0386629 |
| $INNO_{i,t}$ | .2648008* | .2648008** | .1543461 | 2.87411*** |
| LM | | | | |
| Wald (χ^2) | | | 22314.35*** | |
| Hausman (χ^2) | | | 12.48*** | |
| Sargan | | | | 10.19*** |
| AR(1) | | | | -0.70*** |

DISCUSSION

Fintech is a promising solution in Asia and the purpose of this article is to fill the gap of the lack of studies in this particular discipline. In the previous studies, researchers found no evidence of the link between Fintech and financial inclusion with two-year' time lag in Asia. This article results are consistent with previous studies, suggesting that internet density improve financial inclusion. These effects are gradual, becoming significant three years after the adoption of Fintech. Empirical evidence shows that the internet has a substantial positive relationship with financial inclusion, which means that the growth on the internet is related to the increase in finance (Olaniyi Evans, 2018).

The scale of the impact on the number of accounts is significant (64% increase after 3 years adopting internet). This impact is the result of reducing related issues of asymmetric information and transaction costs (Agyekum, 2016). With a unique platform on mobile devices access in the internet, bill payment, charge, money transfer (in and across borders) and other financial services can all be easily implemented (Donovan, 2012). In fact, India with more than 220 million smartphone users, lending is made easier through the application of high technology accessing to the internet, as it helps reach a wider audience when compared to the other approach. In Korea, 4G - LTE networks cover up to 97%, the number of Internet users is nearly 44 million, making it one of the most connected online markets.⁶ Due to the advantages of technology - electronics, Korea has a large e-commerce market where payment methods are also diversified and popular with the people, in which credit cards are the majority of Koreans national favorite. According to Findex report 2017, 95% of adults aged 15 and older own bank accounts. Korea has 146.5 million active internet banking accounts recorded as the end of 2018. Empirical evidence also shows that increasing the flow of information through the Internet makes it easy for Fintech to reach customers to improve financial literacy for people, which indirectly promotes financial inclusion. There is no doubt about potential development of Fintech influence to financial inclusion in Asia. This continent is young and hyper-connected. It possesses an impressive internet penetration rate along with the nationwide usage of mobile phone.

While some policymakers are still considering the challenges and barriers, Fintech startups are making innovation solution to the benefit of all. The beauty of this new wave of innovation is that the mobile technology is a given and the use of data is front of mind ⁷. Innovation in digital channels provide convenience for clients at a lower cost for banks and have been instrumental in helping suppliers overcome challenges related to infrastructure and geography. Meanwhile, financial inclusion also mentioned access to financial services for MSMEs. This is an object that has not been provided credit in the form of organized business, but can only provide credit under a personalized method. "The absence of traditional credit data for financially excluded individuals and MSMEs is a major barrier to accessing financing"⁸. This is an obstacle to financial inclusion for small and super small business entities. The model results also stated that innovation is a key of Fintech to enhance financial inclusion.

CONCLUSION AND POLICY IMPLICATION

Conclusion

Research confirms the important role of Fintech in promoting financial inclusion. When financial access to those who are difficult to access finance or do not use financial services with the participation of

⁶<https://www.statista.com>

⁷ <https://www.bbva.com/en/fintech-innovation-financial-inclusion/>

⁸ EY, 2017, Innovation in financial inclusion, Link: <https://www.ey.com/Publication/vwLUAssets/EY-innovation-in-financial-inclusion/%24FILE/EY-innovation-in-financial-inclusion.pdf>

Fintech through mobile expansion and Internet use reduces both transaction costs and asymmetric information, even for the poor. The benefit of lowering the cost of providing services through the expansion of Fintech for financial service providers and people who use financial services. Industry policymakers and sponsors need to Fintech to develop to achieve a wider financial system and financial inclusion.

Policy Implication

The important role of governments in developing Fintech is undeniable. Legislators play the role of the guarantors in the development of Fintech, keeping its related risks under control as important as securing the appropriate ecosystem infrastructure to promote financial inclusion. Through research results, a complete financial system and better financial inclusion when policymakers create a technology environment for Fintech. Investing in mobile infrastructure and the Internet is the cornerstone of Fintech's digital development. From the experience of China and Singapore, Fintech's infrastructure needs to focus on international technology and networks. For example, most Fintech services require customers to have smartphones connected to the internet. However, the limits of traditional banking infrastructure create an opportunity that Fintech can partner with banks to innovate digital banking services. China proved by the growth of online banking customers and increased online payments. These platforms are the driving force for online banking services such as Mobile banking and Internet Banking as one of the positive drivers of financial inclusion. The government needs to promote and manage commercial banks to collaborate with telecommunications providers to enhance the use of mobile banking. Online banking will not have a positive impact on financial inclusion if the government's investment in international internet connection to increase financial inclusion.

- Promote a digital approach for financial inclusion such as commit to effective coordination between policy makers, central banks, financial institutions, maintain active dialogue among key stakeholders, encourage industry and work with other national authorities to remove barriers.
- Expand the digital financial infrastructure: Improve and modernize the current financial systems, ensure the basic infrastructure. Enhance the internet penetration and its quality.
- Strengthen digital and financial literacy: Raise awareness among SME businesses about the advantages of using Fintech, encourage the consumers to choose the new technology, aid them to understand the benefit and risk of Fintech

In addition to simplifying business procedures, Fintech startups will be easier to develop, to provide services that are subject to financial exclusion without the current financial system providing service for this object.

Recommendations for Fintech companies in developing countries

From the experience of Singapore, Hong Kong, and China, it can be seen that it is necessary for Fintech to understand the digital infrastructure, development, and research of the Fintech industry in developing countries. The application of technology and its use regularly will open online financial products, especially mobile payments through mobile and Internet platforms. Experience from China, mobile payments tend to be popular for small transactions, so e-wallets have grown with a number of big companies like Alipay, Penpay, etc. Besides, SME's capital needs or MSME leads to credit trends of businesses without having to apply strict regulations of traditional banks and institutions.

In addition, from analyzing the status of Asian countries, it can be seen that Asian Fintech companies in general and developing countries in Asia in particular need to consider the following factors before joining Fintech industry.

- Understand the market limits: In these case studies, not all aspects of Fintech are attractive to users due to a number of reasons from artificial intelligence to local technology limitations in the country. Startups in developing countries need to investigate and allocate resources to research on aspects of Fintech that can be developed.
- Understand demographics: Every country has a prominent demographic. Because Fintech is digital-based and access to it exceeds the boundaries. Fintech startups in developing countries need to

understand the potential development of each country based on population, digital indigenous ratio and the effectiveness of digital technology in people like time for equipment digital.

- Investigation of human tendency: Depending on the needs of people, Fintech invests its resources. For example, while China uses India's priority payment and insurance, payment and loan services. Trends in each country are not the same as other trends.
- Select attractive industry: One of the most important factors related to starting a business is capital. As can be seen from the paper, while venture capital investment went into operation, the hot field in the world is retail lending. Startups should consider to operate in this area is also an attractive belief for investors.

With active Fintech, providing digital financial services to people needs to reduce costs when using the service. According to Michelle's study (2016), the provision of digital financial services will not promote financial inclusion when those services charge only for the sake of simplifying operations and reducing operating costs for banks. This is an opportunity for Fintech to dominate the digital financial technology market or to work with banks to provide efficient financial services and reduce costs.

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Role of Financial Education in Consumer Protection

Paul Selva Raj

Introduction

There has been increasing agreement by policy makers that financial literacy is a key pillar of financial market stability. As financial markets become more sophisticated and consumers assume growing share of the responsibility and risk of financial decisions, financial education is necessary to ensure sufficient levels of consumer protection as well as smooth functioning of the financial markets as well as the economy in general.

Strengthening Financial Markets

The past financial crises has taught us many lessons in relation to consumer welfare. The OECD has suggested two primary responses to address the capacity to strengthen financial markets – a stronger consumer protection regulatory framework and financial education tools that are aimed at protecting and better informing financial consumers in their interactions with financial services providers.

Effective financial education and awareness campaigns would help consumers better understand financial risks and products and thus make better decisions according to their personal needs and circumstances.

This would certainly assist the Central Bank's prudential supervision, as it would be more difficult to mislead informed and well-educated consumer. Financial literacy is a necessary condition for financial market efficiency. It is suggested that sound financial management by households contributes to lower social public spending, development of sound, efficient and competitive markets and encourages economic growth.

Sufficient awareness, education and skills regarding financial matter are essential to adopt both financial responsible behaviours as well as access short-term and long-term financial products and services to enhance their financial well-being.

Pressure and Risks on Current Financial Consumers

The growing complexity of financial products over the past decade, coupled with financial innovations and the increasing transfer of risks to households have put enormous pressure and responsibilities on the shoulders of financial consumers. For example consumers need to play a bigger role in preparing for their retirement, preparing for the children's education and having insurance to pay for medical and health needs. Much too often, financial consumers are ill-equipped to face their ever-increasing responsibilities. Worse still, the OECD study in OECD countries found not only low financial knowledge among consumers but often they over-estimate their financial skills, knowledge and awareness resulting in poor decision making that has a negative effect on their financial well-being.

Consumer Protection and Financial Education are Complimentary

It is crucial to note however, that financial knowledge by itself is not a replacement to financial protection to consumers. It does not substitute for financial consumer protection and regulatory frameworks. A strong financial protection regulatory framework is the key. The World Bank would suggest three main components of a financial consumer protection regime:

1. Consumers should receive accurate, simple, comparable information of a financial service or product before and after buying the product;
2. Consumers should have access to expedient, inexpensive and efficient mechanisms for dispute resolution with financial institutions;
3. Consumers should be able to receive financial education when and how they want it.

What is the difference between financial education and consumer protection? The provision of information on financial issues is common to both. Financial education supplements this information with the provision of information and advice. Consumer protection, on the other hand, emphasises regulation and legislation designed to enforce minimum standards, require financial institutions provide consumers with appropriate information, strengthen the legal protection of consumers when something goes wrong, and provides for systems of redress.

Financial education and consumer protection are not substitutes but rather complements. Consumer protection provides a safety net for financial consumers.

Financial education is thus a key complement to consumer protection in the financial services sector. In fact, it can be considered an essential life skill for households.

Factors making financial education increasingly important:

The complexity of financial products

Consumers today face a wide variety of financial products – savings and investment accounts, various forms of debts, complex insurance products and capital markets. Today we have even newer products and services – crypto currency, e-wallets and online services. Sometimes, even relatively straight forward products can appear quite complex to the average consumers, as often they require an understanding of risks versus benefits, time value of money, maturity, pay-out options and various other features.

FOMCA recently undertook a study on the how well consumers understood their insurance policies. We found that most consumers had not read nor did they fully understand what they had signed up for. Unfortunately, when the time for making a claim arrived, they then realised that the policy had many restrictions and limitations that the agent who had sold them the policy had conveniently neglected to inform.

Deregulation of financial markets

Deregulation of financial markets and the reduction in costs brought about by developments in information technology have resulted in a proliferation of new products tailored to meet very specific new markets. These innovations have enabled consumers to gain access to a greater variety of financial products. The diversity of new financial products provide consumers with more choices but also more challenges.

In Malaysia recently, the Central Bank, has de-regulated the sale of motor insurance. Through this liberalisation, the Central Bank indicated that consumers could expect fairer pricing, greater innovation and sustainable protection for consumers. And to get the best value of money in this deregulated markets consumers were expected to manage their own risk, determine clearly their own protection needs and shop around for best coverage value. The issue really then is do consumers have the knowledge and skills to choose the best product?

Pensions are another example of de-regulation. In Malaysia for example, there is mandatory savings by both employees and employers to the Employee Provident Fund as preparation for retirement. However due to low incomes and thus low savings rate, the amount saved after maybe 30 years of working life is too low for sustainable retirement life. Consumers/workers are thus expected to make their own arrangements to supplement their savings for retirement. While there is a Private Pension Administrators Scheme, in which workers can contribute, there still has to be an understanding of the risks and returns as well as commitment to save to ensure sufficient funds for retirement.

The risk is thus being shifted in part by governments and financial institutions to households. Households thus need to be empowered to make the right decisions for their well-being.

Increase in Life expectancy

Life expectancy has generally increased in most countries due to prosperity and better health and healthcare development. This would lead to an aging population whereby a large cohort of retirees might be spending more time in retirement than previous generations and might therefore need to be supported for a longer time. The challenge is that as the issue becomes more serious, the working population may not be large enough to support the ever growing number of retirees without changes to the support programmes.

Cost of Living Issues

In most countries, as in Malaysia, consumers are facing low as well as stagnating incomes coupled with an increasing of cost of living. Financial education is crucial to empower consumers to manage their finances to face these stressful times.

Definition of Financial Education

OECD defines financial education as a process by which financial consumers improve their understanding of financial products and concepts, and through information, instruction and/or advice, develop the skills and confidence to become more aware of financial risks and opportunities, to make informed choices, to know where to go for help and to take other effective actions to improve their financial wellbeing. The three components of the definition are:

Outcome: Financial wellbeing

Purpose:

- To develop knowledge, skills and confidence
 - ❖ to become more aware of risks and opportunities
 - ❖ to make informed choices
 - ❖ to know where to go for help

Method:

- information
- instruction
- advice

Financial Literacy is the understanding of financial concepts, such as interest rates and financial risk, the understanding of financial products, such as insurance and mortgages, and the skills to use this knowledge for **better financial behaviour** (Raaij, 2016).

Financial Capability is defined by World Bank as “the capacity of a consumer to make informed decisions and act in one’s best financial interest, given socio-economic and environmental conditions”. Financial capability is the knowledge, skills, attitude and confidence that lead people to make financial decisions that are appropriate to their circumstances. Financial education is the tool to increase financial capability.

There is widespread recognition that strengthening people’s financial capability is increasingly necessary as financial products become more complex and people obtain financial products for the first time as a result of wide range of distribution channels, including non-bank providers. New products and services and the use of new delivery channels such as mobile phones, e-wallets, smart cards operated by new service providers can provide opportunities to reach large sections of populations that were previously under-served.

Role of Financial Education

Financial education is need to empower consumers to better manage their savings, debts, purchase of assets at their various life stages.

Consumers also need financial education to evaluate and compare the increasingly voluminous and complex information available on different financial products.

Financial education can contribute to consumer well-being by helping them better informed about financial products and services. Becoming financially better informed, involves acquiring information, processing that information and using the information to make better informed decisions.

It has become increasingly important that people are able to manage their personal finances well in order to be financially capable. However, survey in many countries indicate that many people lack the knowledge, skills and motivations to do so.

Conclusion

In order to take advantage of the many opportunities in the financial sector, people need to be equipped with the knowledge, skills, motivations and confidence to make informed decisions on how to manage their personal finances. The need to have a basic understanding of products and services and how to take advantage of them. They need to take actions to implement these decisions and to understand and manage risks, such as over-indebtedness and fraud. People who make good financial decisions and then implement these decisions are more likely to achieve their financial goals, improve their welfare and protect themselves against financial risks and negative shocks. For countries as a whole, strengthening the financial capability of population can strengthen the economy and improve financial stability.

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Consumer Protection Concerns Pertaining to Home Owner's Safety in Light of Bank's Asset Securitization Motives

By

Shanuka Senarath, *Ph.D*



Capital & Interest (for e.g. 20 years)



'Homeownership lies at the heart of the American Dream. Anchor for families and a source of stability for communities. It serves as the foundation of many people's financial security. And it is a source of pride for people who have worked hard to provide for their families.'

- George W Bush
Radio Address by the President to the Nation - 12 June 2001



'Originate-to-hold' (Traditional) Model



Interest & Capital



On Bank's Balance Sheet



Holding Long-term Mortgages



Regulatory Capital Requirements

What if the bank can sell the mortgage?

'Originate-to-distribute' (New) Model



Quick Cash



Off – Balance Sheet



Can Grant More Mortgages



No Regulatory Capital Requirements

More of 'Originate-to-distribute' (New) Model



Sell the mortgage



Special Purpose Vehicle is a company setup (most likely) in a tax haven

Sell
Sell
Sell
Sell



Mortgages



Mortgage Pool



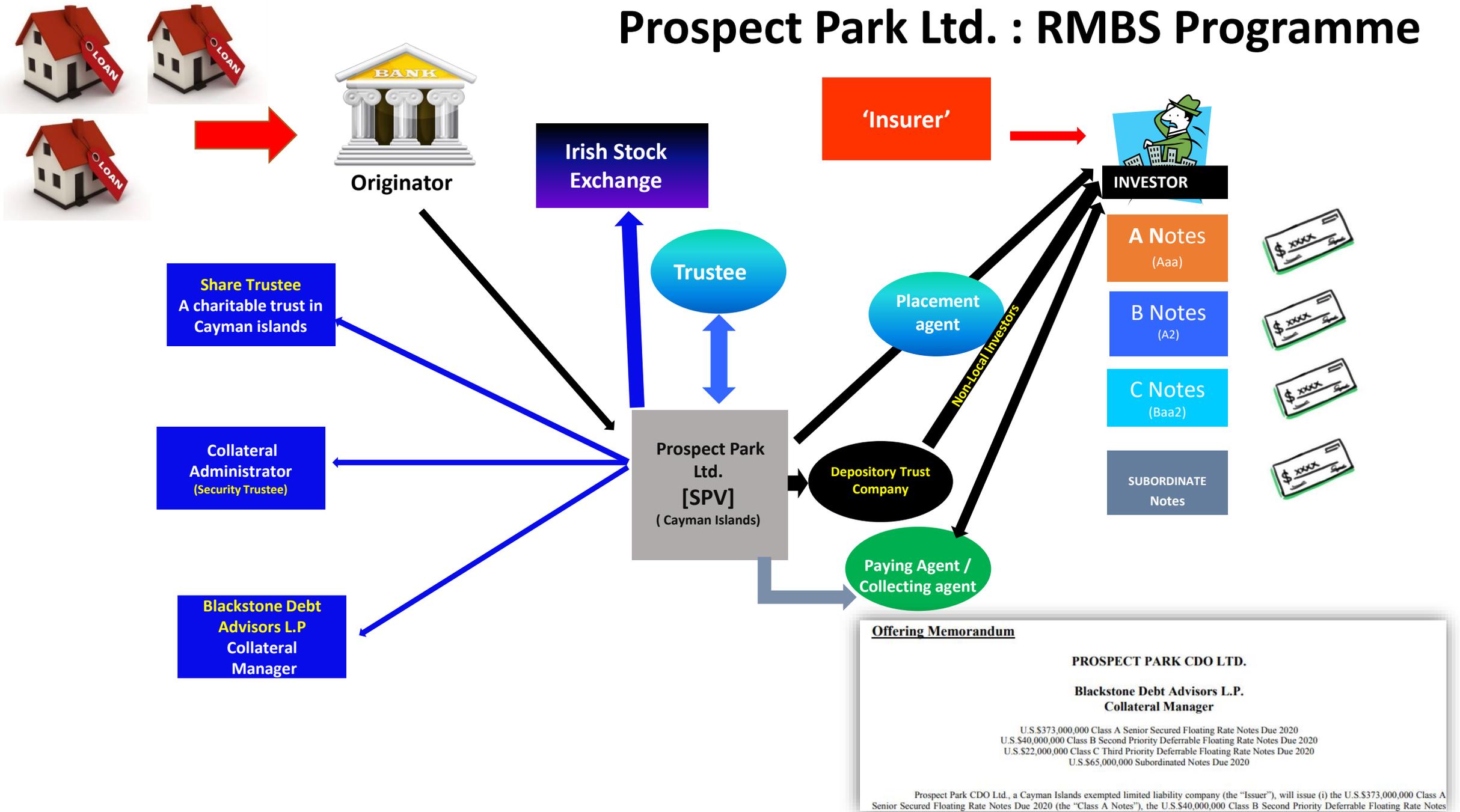
Mortgage Backed Security
"Collateralized Debt Obligation"
(divided into "tranches" and sold at dif. levels of risk)

| RISK | Expected Return |
|------------|-----------------|
| Unsecured | 12% |
| Mezzanine | 9% |
| Sr.Secured | 7% |

"Derivatives"
(broken up into groups and 'derived' from the original pool)



Prospect Park Ltd. : RMBS Programme



Offering Memorandum

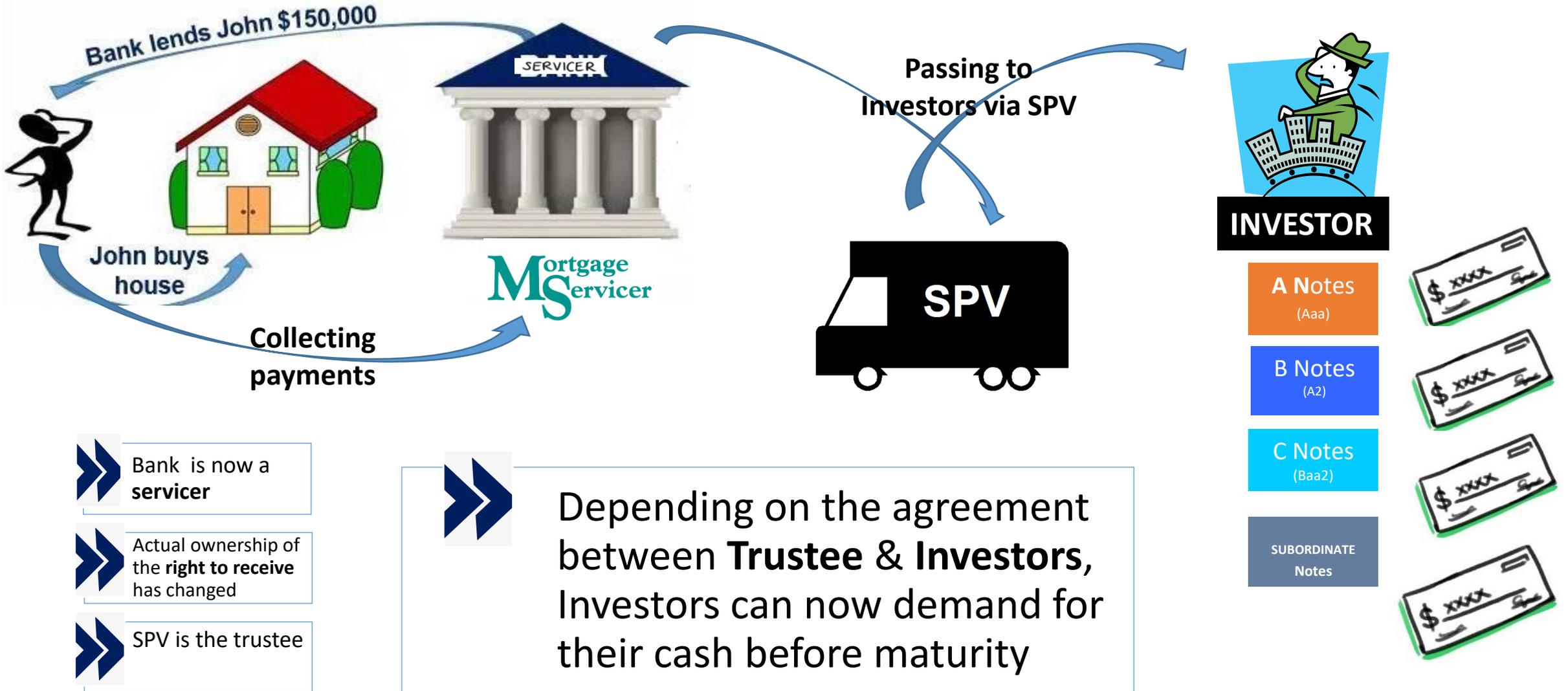
PROSPECT PARK CDO LTD.

**Blackstone Debt Advisors L.P.
Collateral Manager**

U.S.\$373,000,000 Class A Senior Secured Floating Rate Notes Due 2020
 U.S.\$40,000,000 Class B Second Priority Deferrable Floating Rate Notes Due 2020
 U.S.\$22,000,000 Class C Third Priority Deferrable Floating Rate Notes Due 2020
 U.S.\$65,000,000 Subordinated Notes Due 2020

Prospect Park CDO Ltd., a Cayman Islands exempted limited liability company (the "Issuer"), will issue (i) the U.S.\$373,000,000 Class A Senior Secured Floating Rate Notes Due 2020 (the "Class A Notes"), the U.S.\$40,000,000 Class B Second Priority Deferrable Floating Rate Notes

Going Back to Basics !!



What Could Make You Lose Your Home ?



Redemption:

Optional Redemption - (if) 2/3 of note holders give written direction to the trustee

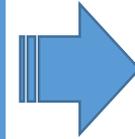
Mandatory Redemption- (if) coverage test [proceeds from notes sufficient to pay note classes] not met

Special Redemption - When collateral manager decides that notes should be redeemed

Economic downturn – Recession – Without any default of the borrower

If the servicer (perhaps by mistake) fail to pass payments

Provided RMBS schemes stretch across international boundaries **currency fluctuations** can lead pre-mature termination of the RMBS program (at least partially)



Trustee is obligated to pay Investors

May have to sell (some) underlying assets to find cash

Likely to sell few (selected) houses via servicer to raise funds

Well-functioning mortgage(s) will be subjected to foreclosure



Is the Mortgagor Aware of the Assignment ?



They Should... But (mostly) they are not



In the Australian Context, most Banks /IMP include a clause (among other clauses) that may read as “**may assign or otherwise deal with [its] rights under this mortgage or any secured agreement in any way [it] considers appropriate**”



But never explain the actual risk behind such assignment



Banks / IMPs would rely on such clauses to avoid liability for loss of their homes



Economic or ethical perspective – informed decisions

Surely not a basis for an informed choice on the part of the borrower



What Does the Law Says ?

Common Law Tradition

- “Some clauses, would need to be printed in red ink, with a red hand pointing to it before the notice could be held to be sufficient”
 - Spurling Ltd v Bradshaw [1956]
- Clause must be presented clearly and unambiguously in such a way that a reasonable person would become aware of it
 - Thompson v Scottish Railway Co [1930]

Civil Law Tradition

- Contractual rights can be freely transferred via *Cession* (cession in Roman Dutch Law (RDL) is the equivalent of assignment)
 - Lee (1915)
- Rights and obligations of a contracting party can be transferred to another by cession (assignment)
 - Weeramanthry (1998)

In Australia

Duty on the bank to take reasonable care to explain all the technical aspects of the loan

-Catering Ltd v National Australia Bank Ltd [1989]

- “Disclosure... will help to ensure honesty and integrity in the relationship; promote informed choices by consumers; and allow the market form financial services to operate effectively”
 - Canham v Australian Guarantee Corporation Ltd [1993]

Unconscionable Conduct ?

Australian Securities and Investments Commission Act 2001 (Cth)

Sc. 12CA(1): ‘A person must not, in trade or commerce, engage in conduct in relation to financial services if the conduct is unconscionable within the meaning of the unwritten law’

Sc. 12CC lists matters to be considered when determining unconscionable

- (a) The relative strengths of the **bargaining positions** of the supplier and the consumer
- (c) Whether the consumer was able to **understand any documents**
- (d) Whether any **undue influence or pressure** was exerted

Summary

- RMBS is a financial instrument that may derive a number of benefits to the financier / financial system
- In practice the mortgagor may not know whether his mortgage has been “sold” to a third party
- Mortgagor may find his home “sold” without any failure to pay from his / her side
 - Due to a Financial / Economic down turn
 - Currency fluctuations
 - Just because the investor wishes to have his money back
- The legal status (both Common Law & Civil Law) is quite unclear in terms of mortgagor’s rights

What Can be Done ?

- Mandatory Disclosure of “Assignment” and its consequences at the initial stage of loan application
- Constitute **unconscionable conduct / misleading & deceptive conduct** for financiers who do not comply with disclosure requirements
- Heavy penalties for financiers not complying with disclosure requirements
- Different loan products
 - For Mortgagors willing to take the risk of assignment – Lower interest rates – passing benefits of securitization to consumers willing to assume more risk
 - For those who are not willing to take more risk – retain the loan with the bank – (probably) with higher interest rates

**BORROWERS' PERSPECTIVE OF MICRO FINANCING INSTITUTIONS
(MFI) AND TRADITIONAL MONEY LENDING (TML) IN BANGLADESH:
A COMPARATIVE ANALYSIS**

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BORROWERS' PERSPECTIVE OF MICRO FINANCING INSTITUTIONS (MFI) AND TRADITIONAL MONEY LENDING (TML) IN BANGLADESH: A COMPARATIVE ANALYSIS

Abstract

The comparative analysis between services of TML and MFIs in Bangladesh noted that the MFIs are positively contributing to employment generation, living standard, household income and education. The limited collateral free MFI loans are not as easily available as TML. Mortgage of wealth and its forfeiting is more common in TML. The MFI loan taking has started under the influence of its mass promotion, but still the clients follow the suit of their ancestors' TML loan taking. The initial screening procedures for MFI loans are strict, objective and stringent. Clients take TML loans for the sake of continuity and procedural lenience even if those are linked with stern collaterals. In terms of repayment policies MFI and TML are not much different; but regarding alternative repayment and loan security TML is more apathetic, harsh, inconsiderate and on occasion cruel on default clients. Regarding sustainability it is found that MFI clients are comparatively doing better in business.