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The Relationship among Financial Education, Financial Literacy, and Financial Behavior

Hae Kyung Yang†

A B S T R A C T

Financial education around the world has been promoted actively. However, the financial literacy level is still low, and financial illiteracy is prevalent. Evidence of the effectiveness of financial education on financial literacy and financial behaviors from previous studies are mixed. Several literature reviews and meta-analyses that discuss causal relationships of financial education, financial literacy, and financial behavior also reported mixed conclusions. Using more recent articles, we reviewed the literature to determine why a consensus has not been reached. We provide suggestions for future studies and evaluations of financial education. We further discuss the implications for policy to improve financial outcomes of individuals.

Keywords: Financial Education, Financial Literacy, Financial Behavior, Consumer Finance

Ⅰ. Introduction

Financial markets are becoming increasingly complex in today's world. New financial products, such as crypto-currency, are spreading rapidly and financial markets are becoming more accessible to individuals which allows them to choose among various investment options. However, many of these investment options are difficult for novice investors to understand. Not only are individuals getting more investment options, but they are also accepting more responsibility for managing their own finances. For instance, in many countries, pension schemes have changed from defined benefit plans to defined contribution plans and individual retirement accounts that result in individuals having to make their own financial decisions. This global trend of disintermediation requires people to determine how much to save and where to invest on their own (Lusardi and Mitchell, 2014).

Thus, how can individuals manage their finances well and become better investors? Many experts emphasize the importance of financial education and financial literacy. More financially literate individuals are expected to make fewer uninformed and irrational financial decisions. Indeed, many countries, including the U.S., promote financial education actively to improve financial literacy of individuals. For instance, the U.S. National Strategy for Financial Literacy 2020 emphasized the importance of financial education in the following quote: "financial education is key to unlocking the foundations of economic opportunity and powering a strong and resilient economy. Americans must acquire financial skills and knowledge to fully participate in our dynamic economy."[1]

However, the level of financial literacy of financial consumers around the world is not high. In fact, financial illiteracy is prevalent even in developed countries (Lusardi

† Professor, Department of Management of Technology Konkuk University, Korea, haekyung@konkuk.ac.kr

[1] U.S. Financial Literacy and Education Commission (2020)

and Mitchell, 2011a). Although financial education has been promoted actively, why is financial illiteracy still prevalent? Is financial education still not enough? Or is financial education not effective in improving financial literacy and financial behavior? Is the link between financial literacy and financial behavior weak? The motivation for this study starts with these questions.

There is a strong belief that to improve financial literacy, well designed and properly timed financial education is crucial. The assumptions that underlie financial education are that financial education increases financial literacy, greater financial literacy leads to better financial behavior, and better financial behavior leads to better financial outcomes (Hathaway and Khatiwada, 2008). However, several recent evaluations of financial education interventions reported that the effect of financial education was limited. Even more, the impact of financial education and financial literacy on financial behavior was questioned by scholars. Is it financial literacy or some other related psychological traits, such as numeracy, propensity to plan, or cognitive ability, that drive an individual's investment performance rather than financial knowledge? This question is often raised because the causal link between financial literacy and financial behavior is not clear (Lusardi and Mitchell, 2014).

The purpose of this paper is to review current studies on the causal relationships among financial education, financial literacy, and financial behavior and to discuss the implications of previous literature on future research and policy. There are several extensive literature reviews and meta-analyses on these causal relationships. However, previous literature reviews and meta-analyses do not provide consistent conclusions. Some papers supported the effectiveness of financial education interventions, but others did not. With more recent articles, we reviewed studies to find out why previous conclusions were not consistent.

This paper is organized as follows. In the next section, we discuss the definition and effectiveness of financial literacy. In section 3, we check the current level of financial literacy and financial education efforts. In Section 4, we discuss potential endogeneity in financial literacy and financial education. In Section 5, we focus on previous literature reviews that dealt with the link among financial education, financial literacy, and financial behavior. Section 6 discusses implications for future financial education, evaluation, and policy.

Ⅱ. The Definition and Effectiveness of Financial Literacy

What is financial literacy? There are various definitions. For example, Lusardi and Mitchell (2014) defined financial literacy as people's ability to process economic information and to make informed decisions about financial planning, wealth accumulation, debt, and pensions. The Jump$tart Coalition for Personal Financial Literacy (2015) defined financial literacy as "the ability to use knowledge and skills to manage one's financial resources effective for lifetime financial security." OECD and International Network on Financial Education (OECD/INFE, 2011) provided a more comprehensive definition that financial literacy is a combination of awareness, knowledge, skill, attitude, and behavior necessary to make sound financial decisions and ultimately to achieve an individual's financial wellbeing. Hastings et al. (2013) proposed that financial literacy included several aspects, such as knowledge of financial products, knowledge of financial concepts, mathematical skills or numeracy, and engagement in certain activities, for example, financial planning.

Although the definition of financial literacy varies, researchers have emphasized consistently that financial literacy is a multi-dimensional concept. This implies that it is difficult to disentangle financial behavior from financial literacy, which is the cause of the problem in estimating the effect of financial literacy on financial behavior. Because a behavioral component is already included in the definition and measurement of financial literacy, we are estimating the effect of financial behavior and financial knowledge combined on financial behavior. Individuals can learn from their investment experience. Hilgert et al. (2003) reported that individuals cited personal experience as the most important source of financial learning, which implied the possibility of reverse causality. Hence, if we do not choose the estimation method carefully, reverse causality or reciprocal causality may bias the estimate of the impact of financial literacy.

People who are more financially literate are more likely to plan retirement and to accumulate more wealth (Lusardi and Mitchell, 2007a, 2007b, 2011b, 2011c). Those with low financial literacy are more likely to engage in costly credit card usage (Motola, 2013). More rigorous methods to find a causal relationship, such as instrumental variables and experimental approaches, also suggested that financial

literacy plays a role in influencing financial decision-making (Lusardi and Mitchell, 2014). However, some other studies reported limited effectiveness of financial education and financial literacy. Financial education interventions have been evaluated in the U.S., Europe, and around the world for more than 30 years. Yet, the impact of financial education on financial literacy is unclear, and the impact on financial behavior is even more unclear (Rutledge, 2010). Cole and Shastry (2007) argued that financial education did not affect financial decisions, but financial education may have affected decision-making through personality and other psychological factors. Other researchers, such as Willis (2008), further argued that financial education failed to improve consumer decision-making and may even have been harmful by developing over-confidence. Rutledge (2010) suggested that building financial literacy was a long-term investment, and the effectiveness of financial education should be measured and evaluated carefully.

Ⅲ. Current Level of Financial Literacy and Financial Education Interventions

The current level of financial literacy around the world is quite low (Lusardi and Mitchell, 2011a). For example, in the U.S., financial literacy for the general population is quite low. In the 2018 National Financial Capability Study, only one-third of adults could answer at least four out of five financial literacy questions on concepts such as mortgages, interest rates, inflation, and risk (U.S. Financial Literacy and Education Commission, 2020). The older U.S. population was quite illiterate financially, and most high school students received a failing grade for financial literacy (Lusardi and Mitchell, 2014).

In Korea, according to the Bank of Korea and the Financial Supervisory Services' 2020 measurement of financial literacy[2], the financial literacy score of Korean adults was on average 66.8 out of 100, which was a bit higher than the OECD average of 62. Among the three components of financial literacy, financial knowledge and financial behavior scores were above the OECD average, but the financial attitude score was below average, especially for the younger generation. The elderly's financial literacy scores were lower than the total average.

Low levels of financial literacy are also prevalent in other countries. Hastings et al. (2013) summarized results of financial literacy assessments that included the Netherlands (2010), U.S. (2004, 2009, 2010), Japan (2010), Chile (2009, 2012), Mexico (2010), Indonesia (2007), and India (2006). Other surveys around the world showed low financial literacy scores in general. Lusardi and Mitchell (2011a) reported a high level of financial illiteracy in Germany, the Netherlands, Sweden, Japan, Italy, New Zealand, and the U.S., especially among the older population. The older population believed they had financial knowledge, but according to the survey, their financial literacy scores were below average.

As a result, many countries have started national initiatives. For example, in the U.S., concerns about poor financial decision-making and weak consumer protections in financial markets resulted in the creation of the Consumer Financial Protection Bureau (CFPB) in 2010. In addition to its regulatory function, CFPB is mandated to establish an office of financial education to develop a strategy to improve the financial literacy of consumers. In addition, the Financial Literacy and Education Commission (FLEC), which is composed of 23 federal government entities, was created to improve the financial literacy and education of people in the U.S. (FLEC, 2020). FLEC oversees creating, implementing, reviewing, and updating the national strategy to promote financial literacy and education. The Jump$tart Coalition for Personal Financial Literacy is a nonprofit, public-private partnership of educators, private companies, and government that was founded in 1995. They provide personal finance education in schools for kindergarten through 12 grades.

Some reviews of large-scale interventions reported that the impact of financial education was lower than expected. Tennyson and Nguyen (2001) analyze a 1997 survey of high school students conducted by the Jump$tart Coalition for Personal Financial Literacy and report that states' personal finance curriculum mandates are not associated with students' financial literacy test scores. The 2008 Jump$tart survey of high school seniors found that financial literacy of high school students was at the lowest level since they started measuring, and students who took a personal finance course did no better than those who did not (Mandell, 2009). Dwyer et al. (2020) compiled youth

[2] Bank of Korea and Financial Supervisory Service (2020)

financial education spending by U.S. state governments and nonprofit organizations since 2001 and identified the impact of this spending for low- and moderate-income U.S. residents. They found that financial education for students had increased since early 2000 and that increased financial education mandates were linked to a decrease in financial fragility. Although they found that individuals were more likely to be able to afford emergency expenses, they did not find that financial education was associated with an individual's ability to afford routine health care. In addition, although increased spending on financial education by nonprofits was related to a lower likelihood of the individual having a retirement savings account, this was because nonprofits provided financial education to those who did not have a retirement savings account.

Despite these interventions, why is the level of financial literacy still low? There are several possibilities. The first is that we have not provided enough financial education yet. There is still not enough financial education, and we need to create more interventions. The second possibility is that financial education interventions undertaken so far may not have been effective enough. Third, financial education may not have much effect on financial literacy. To find out more, we need to look at the findings in the literature and to discuss the relationship among financial education, financial literacy, and financial behavior.

Ⅳ. Endogeneity in Financial Literacy and Financial Education

Why is it challenging to establish a causal link between financial literacy and financial behavior? In section 2 we discussed why it was difficult to disentangle the effect of financial literacy on financial behavior. Is there any endogeneity in financial literacy? According to studies, it is an individual's decision to acquire financial literacy. Financial literacy is a choice variable. Individuals invest in financial knowledge (Lusardi et al, 2011, 2013; Lusardi and Mitchell, 2014). Those with higher net worth were more likely to improve their financial knowledge because they had more at stake (Lusardi and Mitchell, 2014). This implied a potential reverse causality in that net worth may have affected an individual's financial literacy through an individual's experience or financial behaviors. Does financial literacy affect financial outcomes or does an individual's experience in managing their finances improve financial literacy?

If financial literacy is a choice, then, on the other side, some people will rationally choose not to invest in financial literacy. For low income and less educated people, investing in financial education and financial knowledge may not have been worth it, because most of them were eligible for social transfer programs (Lusardi and Mitchell, 2014). This implied that without addressing the endogeneity of financial literacy, this can bias the estimate. Another source of endogeneity is omitted variable bias. There are other confounding factors that are potentially related to financial literacy, such as numeracy, cognitive ability, intelligence, and other psychological traits. Individuals with higher general cognitive abilities or numeracy were likely to have higher levels of financial literacy (Banks and Oldfield, 2007, Gerardi et al., 2010, Hastings et al., 2013).

Another problem arises when evaluating financial education programs because of their voluntary participation. In Korea, financial education is focused on future financial consumers, such as students and military personnel, rather than current financial consumers. In addition, participation in financial education programs is voluntary (Kim, 2020). The government encourages individuals to participate, but it cannot enforce the participation. In practice, financial consumers do not participate in financial education eagerly, especially those who need to improve financial literacy. Whereas those volunteers who participated in financial education programs were more motivated, which caused a self-selection problem. Because their motivation was higher than non-participants, the effect of the program on the participants was estimated as higher than its true effect if the intervention was not randomized. In practice, many financial education programs have often omitted evaluation as a component of the program design (Fox et al., 2005).

The golden rule of evaluation is the experimental approach (Collins and O'Rourke, 2010; Lusardi and Mitchell, 2014). That is, to evaluate the effectiveness of a financial education intervention, experimental or quasi-experimental designs are the best ways to establish a causal inference. A randomized controlled design with treatment and a control group is essential. Randomized controlled trials (RCTs) provided more consistent internal validity than observational and quasi-experimental studies, because

there were no consistent instruments for financial literacy (Kaiser et al, 2020). However, few financial education programs have been designed or evaluated with this approach (Lusardi and Mitchell, 2014).

V. Linking Financial Education, Financial Literacy, and Financial Behavior

There are several extensive literature reviews on the effectiveness of financial education on financial literacy and financial behavior, such as Fox et al. (2005), Lyons et al. (2006), Martin (2007), Hathaway and Khatiwada (2008), Collins and O'Rourke (2010), Gale et al. (2012), Hastings et al. (2013), and Lusardi and Mitchell (2014) (Table 1).

All the literature reviews considered here looked at the effectiveness of financial education. However, not all of them provided clear evidence that financial education was effective for improving financial literacy and financial behavior. For example, Hathaway and Khatiwada (2008) argued that evidence in favor of financial education pro-

Table 1. Literature reviews of the relationship among financial education, financial literacy, and financial behavior[1)]

Authors	Title and Summary
Fox et al. (2005)	*Building the case for financial education* provides an overview and effectiveness of financial education programs. Provides a framework to guide financial education evaluation.
Lyons et al. (2006)	*Are we making the grade? A national overview of financial education and program evaluation* provides an overview of financial education and program evaluation. Surveyed and interviewed financial educators using focus groups.
Martin (2007)	*A literature review on the effectiveness of financial education* reviews the literature on the effectiveness of financial education programs to enhance financial literacy. Concluded that financial education was necessary and effective. However, did not differentiate non-experimental designs and experimental designs.
Hathaway and Khatiwada (2008)	*Do financial education programs work?* provides review of research that investigated the impact of financial education programs on financial behavior and concluded that the evidence for effectiveness of financial education was not sufficient. Pointed out that some financial education programs were effective if the audience, the area of financial activity, and time were targeted.
Collins and O'Rourke (2010)	*Financial education and counseling - still holding promise* reviews evaluation of financial education and counseling for adults and found that the estimates of the impact of financial education that was reported in most research reports were positive, but when compared with comparison groups they were often small. In addition, self-reported measurements, short time periods, and self-selection into programs may have biased the estimates.
Gale et al. (2012)	*Raising household Saving: does financial education work?* reviews research on how financial literacy affects saving, and reports that previous results were mixed. Workplace interventions increased saving, but estimates varied. When financial education was targeted to groups other than workplace, the impact was much more ambiguous. Suggested more rigorous evaluations are needed.
Hastings et al. (2013)	*Financial literacy, financial education, and economic outcomes* reviews literature on financial literacy, financial education, and financial outcomes. The evidence in the literature on whether financial education improved financial outcomes was mixed. Current literature was inadequate to conclude financial education was cost-effective.
Lusardi and Mitchell (2014)	*The Economic Importance of Financial Literacy: Theory and evidence* provides a comprehensive review of literature on financial literacy including an overview of theoretical research and a survey of literature on less financially literature groups, and the impact of financial literacy on economic decision making Also provided implications for future research and policy.
Fernandes et al. (2014)	*Financial literacy, financial education, and downstream financial behaviors* conducts a meta-analysis of the relationship of financial literacy and of financial education to financial behavior in 168 papers with 201 studies. Reported that interventions improved 0.1% of variance[2)] in financial behavior.
Kaiser et al. (2020)	*Financial education affects financial knowledge and downstream behaviors* conducts a meta-analysis of 76 RCTs and concluded that financial education had positive effects on financial knowledge and financial behaviors. Reported that treatment effects were economically meaningful in size.

Note: 1) Papers introduced here are not a complete list of the literature reviews of the relationships among financial education, financial literacy, and financial behavior. The articles introduced here were widely cited by others.; 2) r^2= 0.0011. The effect size was computed by the partial correlation coefficient, r, following the common guidelines for meta-analysis.

grams was not clear overall, but they saw a pattern that programs that were more targeted were more effective in changing financial behavior. They suggested that financial education programs should target specific audiences, behaviors, and timing. They also suggested program evaluation should be included in the design of the education program itself. Gale et al. (2012) reported that results from previous financial literacy interventions were mixed. Interventions in the workplace changed behavior, but the evidence was more ambiguous when initiatives were targeted to other groups. Hastings et al. (2013) investigated the literature on financial education and financial outcomes that ranged from small scale experiments to large scale natural experiments, and they concluded that the evidence from previous evaluations on whether financial education improved financial outcomes was best described as mixed.

Further, some researchers provided meta-analyses of the impact of financial education and financial literacy on financial behavior. The first meta-analysis of financial education was done by Fernandes et al. (2014). They analyzed 168 papers that included 201 studies from 1969 to 2013. They searched using keywords “financial literacy”, “financial knowledge”, and “financial education” and focused on empirical tests. They classified studies into two types. The first was experimental and quasi-experimental studies of financial education interventions that they called manipulated financial literacy. The second type were correlational studies that measured financial literacy. Among these studies, 15 were RCTs and 24 studies used instrumental variables to control for endogeneity of financial literacy. The remaining studies used pre-post designs with ordinary least square regressions to estimate the effect of financial literacy on financial behavior.

Fernandes et al. (2014) reported that correlational studies that measured financial literacy found stronger associations between financial education and financial literacy. However, with quasi-experimental methods, the partial effects of financial literacy diminished after controlling for psychological traits, which implied that there was omitted variable bias. In the interventions, financial literacy only explained 0.1 % of the variance in financial behaviors, with weaker effects in low-income groups. Studies that used randomized control groups showed no significant effects and significantly lower effects than other types of studies. The authors explained that larger effect sizes for measured financial literacy may have been, in part, due to the correlation of measured financial literacy with other psychological traits that were omitted from prior research. These omitted variables may have caused overestimation of the effect of financial literacy on financial behaviors.

Meta analysis results by Fernandes et al. (2014) implied that financial education did not improve financial literacy very much. In their conclusion, financial education interventions were overestimated by correlational studies. The effect of financial literacy was also overestimated because of other related psychological traits.

Since Fernandes et al. (2014), studies related to financial literacy have increased exponentially. The number of RCTs of financial education increased from 15 in Fernandes et al. (2014) to 76 by 2019 (Kaiser et al., 2020). Exploiting this increase in the literature, Kaiser et al. (2020) provided an updated meta-analysis of financial education. Specifically, they analyzed 76 RCTs of financial education interventions published up to 2019.

Kaiser et al. (2020) observed that the number of recent RCTs drove more positive results of treatment effects of financial education on financial knowledge and behaviors. First, they found that financial education programs had positive causal treatment effects on financial knowledge and financial behaviors. Second, they claimed that treatment effects were economically meaningful in size and, specifically, that the effect was three times more than what was reported in Fernandes et al. (2014). The treatment effects on financial knowledge were similar or larger than the average effect sizes by math and reading education interventions. Also, the effects on financial behaviors were comparable to those behavior-change interventions in the health care area (Kaiser et al., 2020). Third, their results suggested that recent interventions were more targeted and more effective. They also pointed out that accounting for heterogeneity in studies and programs was important in assessing the average impact of financial education.

Although it is encouraging to see that the most recent meta-analysis showed positive and significant impacts of financial education, it needs to be validated by other studies. Other than Kaiser et al. (2020), most of the recent literature reviews reported that effectiveness was still inconclusive. Hastings et al. (2013) pointed out that the reason we cannot determine the effectiveness of financial education was because we did not have enough valid evidence from large scale RCTs. Based on the experiments

analyzed in Kaiser et al. (2020), three randomized experiments out of 76 that were published after 2004 had a sample size greater than 10,000. These larger experiments were published after 2016 with samples from school age students.

VI. Discussion

In this paper, we reviewed the literature that discussed the impact of financial education on financial literacy and financial behavior. We conclude with a few implications for future evaluations, financial education interventions, and policy. We start with the implications in evaluating financial education. First, the impact of interventions on the delivery of financial education on financial literacy and on financial behavior is evolving (Rutledge, 2010; Collins and O'Rourke, 2010). However, the effectiveness of these programs should be measured and evaluated carefully. Without valid control groups and a randomized design, the estimated impact of intervention may not be convincing.

Literature consistently claims that there is still no concrete evidence that financial education is effective, and the effectiveness of financial education on financial literacy can best be described as mixed. The effect on financial behavior is even more controversial. One of the reasons why we cannot make a conclusion is because we do not have enough valid evidence from large-scale randomized interventions to identify causal relationships (Hastings et al., 2013). It would be helpful if future financial education programs included evaluation as a component of the program design (Hathaway and Khatiwada, 2008), and existing large-scale surveys should include experimental components (Hastings et al., 2013).

Next, suggestions for financial education programs are that they should be targeted to the audience, to certain types of financial behavior, and to timing. As we have seen from the literature, financial education is not effective for everyone. Financial education is costly, and it can be more cost-effective when the audience is targeted.

In terms of targeted time, in Korea for example, financial education is mostly provided to students and military, but not to financial consumers. Although it is optimal socially to increase financial knowledge early in life (Lusardi and Mitchell, 2014), the timing of financial education is not at a point when financial decisions are made. Hence, the impact of financial education is expected to be limited (Kim, 2020). Financial education is expected to be more effective when it is provided at the time when financial decisions are made (Fernandes et al., 2014).

In addition, the content of financial education for students should focus on basic financial concepts rather than up-to-date financial terminology. Many of the financial decisions that individuals face in their adult lives have little relevance to a high school student. Likewise, when a high school student becomes an adult, the financial environment may have changed. Hence, financial education should focus on basic financial concepts, such as compound interest, good debt, diversification, mutual funds, liquidity, and so on (McGee, 2021).

Given the inconclusive evidence on the effectiveness of financial education, are there alternative ways to improve financial behavior? First, we need to clarify what the goal of the policy is. If the goal is to improve an individual's financial capability, we need to know how one acquires financial capability. Is education the only way to improve one's financial capability? Individuals can also learn from their own experience, which is well implied by wealthier individuals who are more financially literate (Hastings et al., 2013). If the goal is to improve an individual's financial outcomes, then we need to clarify whether financial education accomplishes that. Does an investor who is more financially literate perform better in financial markets?

One alternative way to improve an individual's financial behavior is to design policies that address biases and reduce the decision-making costs that consumers face in financial markets. For example, as financial markets around the world are becoming more accessible to individuals and individuals have more investment choices, to help an individual's financial decision-making it will be important to reduce search costs through standardized and centralized information (Lusardi and Mitchell, 2014). For contracts or decisions that people make infrequently, such as buying a house or saving for retirement, it may be useful to structure the information to make it easy to understand.

Another way of enhancing an individual's performance in financial markets might be to outsource to financial advisory services. Some have argued it is not feasible or even desirable to make everyone a financial expert

(Willis, 2008). Financial advisory services can complement or substitute for financial literacy, especially for lower socioeconomic status groups. Collins (2012) found from empirical analysis that financial advice often worked as a complement to financial capability, given that individuals with more income, more education, and a higher level of financial literacy were more likely to receive financial advice.

We also need to be aware of principal-agent problems in financial advisory services that have been reported in some studies. For example, Mullainathan et al. (2012) found that many advisors acted in their personal interests regardless of the client's actual needs and that they reinforced client biases. Anagol et al. (2015) studied life insurance agents in India and found they recommended products with higher commissions even if the products were suboptimal for the customers. Governments can monitor the market to check whether this kind of market failure exists.

Overall, the literature suggests that there are alternatives to financial education that can be used to improve financial outcomes for individuals. Financial education is one option. At this point, we cannot draw conclusions as to which tool is more cost-effective in improving an individual's financial behavior because the evidence is still developing. Future research may compare different policy options (e.g., direct regulation, financial education, choice architecture) to enhance an individual's financial capability. To do this, we need not only estimates of effectiveness, but also the cost of each tool.

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How to Protect Financial Consumers in Virtual Asset Markets? Issues in Korea

Jabonn Kim†

A B S T R A C T

This paper is concerned with appropriate regulatory remedies to manage and control the overheated speculation and significant fraudulent activities in virtual asset markets in Korea. The cryptocurrency market has grown like skyrockets in size as measured by market capitalization and trading volume, particularly during this COVID-19 pandemic period. As the market has been growing too fast, regulatory responses haven't been prepared and applied to the market in a timely matter, and a lot of speculative and fraudulent activities have risen under the regulatory shadow. In order to make the market develop soundly with integrity, appropriate regulatory measures should be introduced including externality checks and controls, securities and financial conduct regulations, strict investor identification, financial education, and financial consumer protection like in other banking and securities services.

Keywords: Virtual Asset Markets, Cryptocurrencies, Financial Consumer Protection, Korea

Ⅰ. Introduction

This paper is a rewriting of my keynote speech for the annual conference of the International Academy of Financial Consumers (IAFICO) in August 2021. The objective of this paper is to investigate the problems in virtual asset markets and to suggest some policy responses. It mainly discusses regulatory and legal issues for financial consumer protection in the virtual asset market in Korea.

It is the virtual asset market that has most expanded during the COVID-19 pandemic in Korea, and in the world as well. As the market has been quickly growing, regulatory responses haven't been prepared and applied to the market in a timely matter. Therefore, serious financial consumer protection issues have occurred.

If the market is allowed to keep going like this without appropriate regulatory interventions, the market may become a weak spot that could generate and spread risks into financial markets overall. The first policy intervention that must be urgently arranged should be measures to check any possibility of a coin run and its externalities. Additional measures are also urgently needed to stop the high-pitched speculations and fraudulent activities in the market. The available policy measures for the second purpose are, for example, securities and financial conduct regulations. A third policy that is needed is to introduce strict investor identification rules such as a Know-Your-Customer (KYC) rule in cryptocurrency transactions. Anonymity in cryptocurrency transactions seems to create bigger social costs than benefits. The fourth measure is financial education as a mandatory duty of virtual asset exchanges for their investors. The last one is an application of the Financial Consumer Protection Act of 2021 into the virtual asset market.

The remainder of this paper is organized as follows: Section II describes the characteristics of the virtual asset

† Senior Fellow, Korea Institute of Finance 11-gil 19 Myoung-dong Chung-gu Seoul 04538, Republic of Korea, jbkim@kif.re.kr

market, especially during recent COVID-19 pandemic in Korea. Section III discusses fraudulent schemes and financial consumer losses. Section IV discusses regulatory loopholes and suggests some policy responses. Section V provides concluding remarks.

Ⅱ. Virtual Asset Markets during the COVID-19 Pandemic in Korea

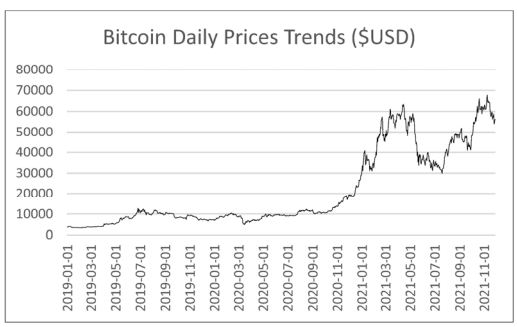
Virtual asset markets are dominated by excessive investment and fraudulent schemes, but there is no robust legal basis for regulation yet in Korea or in some other countries with similar situations. In Korea, recently the number of investors has been growing fast. For example, it was around a little more than 10,000 in October 2020, but it increased ten times a month later to more than 100,000 in November 2020, more than 1 million in March 2021, around 2 million in April 2021, and by May 2021 it was more than 6 million (Chosun-ilbo, 2021). Prices of cryptocurrencies in Korea were around 18~20% higher than international prices of the same cryptocurrencies. For example, the price of Bitcoin was 18.1% higher in Korea, Ethereum 18.0% higher, Ripple 18.5% higher, and BitcoinCash 20.1% higher than the internationally transacted prices on April 6, 2021 (Donga-ilbo, 2021). This is the so-called *Kimchi* premium revealing that virtual asset investments in Korea were more overheated than the investments in other countries. According to Pieters and Vivanco (2017), the premium depends on regulatory differences in investor identification requirements. Unless identification is required, the premium will be larger.

Most of the investors were 2030 young adults who are around 70% of the whole new investors entered during the first quarter of 2021 (JoongAng-ilbo, 2021; New1, 2021). This means that the young generation who should-be-most-promising-and-be-sound at the start line of their lives is vulnerable to fraud and might be obsessed with wishful thinking which could be a condition of a sort of irrational exuberance (Shiller, 2015).

Figure 1 shows the trend of bitcoin prices. Figure 2 shows the trend of daily new cases of COVID-19 since the beginning of the pandemic early last year. The two graphs are quite co-moving, and the COVID-19 case trend leads the bitcoin price trend. On October 2020, Bitcoin prices were at the same level as the average of 12 months, but the number of COVID-19 cases was continuously increasing and right before a steep peak. Of course, the COVID-19 virus does not create any intrinsic value of bitcoin but they are highly correlated. Why?

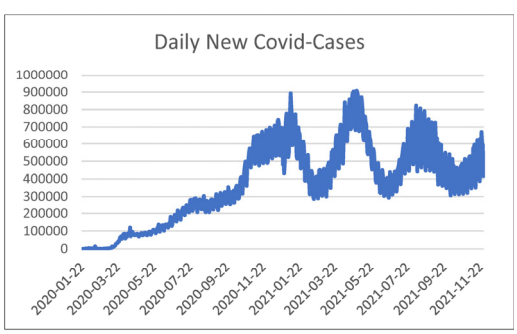
There may be two possibilities. First, the genuine value of bitcoin has increased during the pandemic period. Second, there may be a belief or gamble that genuine value of bitcoin will increase. Presuming the second is true, we need to discuss this market anomaly and its implications for financial consumer protection.

In Korea, virtual asset daily trading volume is 32.6 billion U.S. dollars (USD) as of April 2021 and that is bigger than the daily trading volume in stock markets of 25 billion USD, as of the same period. The number of investors for virtual assets is 6.12 million, while number of stock investors is around 10 million as of May 2021. Considering the short history of the virtual asset market that began around 2009 and stock market that have been



Source: https://coinmarketcap.com/currencies/bitcoin/

Figure 1. Trends of Bitcoin Price ($)



Source: https://www.worldometers.info/coronavirus/

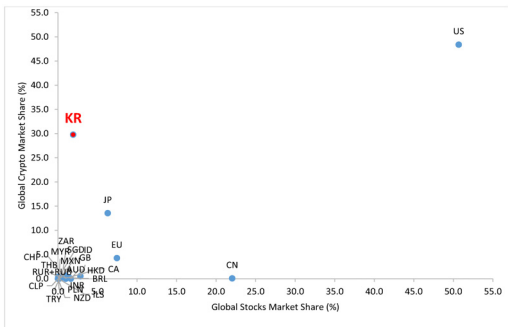
Figure 2. Trends of Daily New Cases

operating since 1956, it is surprising that the number of virtual asset investors is more than 60% of stock market investors. The virtual asset market investor, 6.12 million, itself is a big number. The Korean total population is a little more than 50 million. So, more than 10% of the total population participates in the market as investors.

The virtual asset market of Korea is one of biggest in the world (Pieters,2018; Pieters and Vivanco, 2017). First, virtual asset market capitalization of Korea is second in the global virtual asset market. The U.S. virtual asset market capitalization is 50% of global market capitalization, and the virtual asset market capitalization of Korea is around 30% of global market capitalization (Figure 3), while Korean stock market capitalization is less than 2% of global stock market capitalization (indexmundi.com, 2021). Second, virtual asset daily trading volume over stock market daily trading volume of Korea is exceptionally high, even higher than the same ratio of the U.S and the difference is big. The ratio is only 5% in the U.S. However, it is 80% in 2018 and 130% in April this year in Korea (Figure 4). This is an obvious excessiveness in the virtual asset market especially by 2030 young investors who mostly borrow a large amount of debt for the investment.

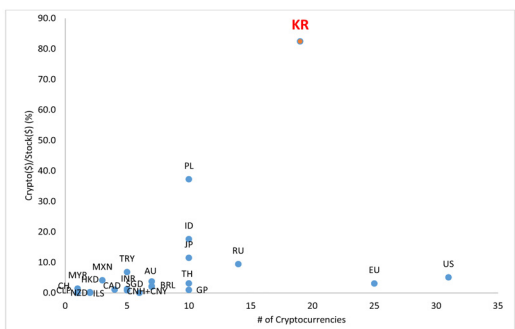
During the first quarter of 2021, household debt increased 9.5% comparing to the same quarter last year which is historically high, of which mortgage loan increased 8.5% and credit loan increased 10.8% (Bank of Korea, 2021a). Since most 2030 young adults are not homeowners, they could only borrow by way of credit loan which is one of the main reasons why credit loan increased more than mortgage loan. Debt increase of 2030 young adults from the end of 2019 to the end of 2020 was 17.3% (Bank of Korea, 2021a, Hankyang, 2021).

The debt of 2030 young adults is 25.5% of total household debt as of the end of 2020, which may be the highest one if it is normalized by income or wealth sizes for each age groups of 2030, 4050, and 60+. The over-in-debtedness of 2030 is called *Young-Kkul-Bit-Tu,* a Korean term meaning 2030's excessive investment with big debt collateralizing even their souls. Of course, no souls can be collateralized but it is just a symbol of their excessive eagerness.



Source: This graph is constructed using data in Pieters (2018) and Park (2021).

Figure 3. Global Market Shares



Source: This graph is constructed using data in Pieters (2018) and Park (2021).

Figure 4. Relative Daily Trading Volume

Ⅲ. Fraudulent Schemes in Virtual Asset Markets

Virtual asset markets are widely being dominated by fraudulent purposes including Ponzi schemes, price manipulation, speculation (gambling), tax evasion, etc. In the virtual asset market in Korea, typical Ponzi schemes often appear (Korean National Police Agency, 2011; Women News, 2021; News Tomato 2021). For example, in a Ponzi scheme, an exchange attracted investors to deposit 6,000 dollars, promising high returns as much as 3 times of the deposit in several months, and the exchange successfully collected funds of 1.7 billion dollars from 40,000 number of investors. If an investor brought a new investor in the exchange, the exchange paid the investor the commission of 1,200 dollars per new investor. Once investors

began to show their trust to the exchange, the exchange circulated their own cryptocurrency tempting that their currency will be pricey in the market. The scheme targeted mainly retirees and housekeepers who are relatively financially illiterate. Another exchange collected 4 billion dollars from 70,000 investors using a similar Ponzi scheme. Many virtual asset exchanges in Korea are being suspected of manipulating Ponzi schemes.

An unique price manipulation technique was uncovered. It is called *Gaduri,* a Korean term meaning instruments such as a closed box or a net that captures birds on the ground or traps fish in the sea. *Gaduri* pumping closes doors for new entry and exit of coins out of an exchange without notifying their investors, and the exchange self-trades the given amount of the coin using its own multi-accounts. Then the coin price begins to increase, and the exchange opens its doors for new entries of investors. Investors do not know the truth of the situation and just believe that the genuine value of the coin might increase. *Gaduri* pumping was typically utilized immediately after the exchange was hacked. Price manipulation is a crime in Korea, and the number of such manipulating crimes has been increasing more than 7 times, from 41 in 2017 to 333 in 2020.

Globally it is also known that the motivations for investments in virtual asset markets are speculation, tax evasion, money laundering etc. In the UK, for example, speculation is serious. 47% of investors bought cryptocurrency as a gamble (HM Treasury, 2021). In the U.S., 36% of cryptocurrency transactions are motivated by tax evasion (Williams, 2018).

Ⅳ. Regulatory Loopholes in Virtual Asset Markets and Policy Suggestions

Why do the fraudulent activities happen so widely? Because there are regulatory loopholes and virtual asset markets just enjoy it. First, virtual asset exchanges have not been required to identify investors. Second, anti-money laundering policy for virtual asset markets recommended by FATF (2019) may still have drawbacks. Customer Due Diligence (CDD) and Enhanced Due Diligence (EDD) need full investor identification for their regulatory implementation but virtual asset transactions are not that identifiable. FATF requires all transactions over 1,000 dollars to be reported but the marginal cost of cutting into smaller pieces less than 1,000 dollars is negligible, using digital techniques. This means that FATF regulation can be evaded and so may not effectively work.

Third, securities and financial conduct regulations are not applied to virtual assets in Korea. Due to this, any initial coin offering (ICO) was not banned in reality even though it was banned legally since 2017 in Korea. Many ICOs were surveyed as active in 2019 (Financial Services Commission, 2019). It works like shadow banking under cross-border regulatory gaps and arbitrage and is kind of underground economy. Fourth, the Financial Consumer Protection Act only applies to traditional services such as banking, securities, and insurance services but not to virtual asset transactions. So, virtual asset issuers and exchanges do not have to comply with fiduciary duty for financial consumers.

Last April, Korean government launched a half-year *Special Oversight Program* based on the revised Anti-money Laundering Act in effect since last March (Office of Government Policy Coordination, 2021). The program requires all exchanges to register by September 24, 2021. Unless registered, the exchange will be forced to be closed immediately. Criminal Penalties will be charged against intentional defaults by an exchange, misappropriation of investor funds, or data manipulation. Under the program, recently more than 10 exchanges have been found using fake accounts to avoid anti-money laundering regulation. Currently the total number of exchanges in Korea is 79.

We need to further take policy measures for virtual asset market integrity and consumer protection.

First of all, the possibility of a coin run and its externality to financial market should be checked. Bank soundness and 2030 young adults can be negatively impacted by coin runs. Of course, virtual asset market capitalization of about 50 billion dollars is relatively small as it is 1.9% of Korean stock market capitalization. However, default can happen even with the last 1% of debt. That is, marginality could create a bad situation. The household debt ratio is relatively quite high in Korea. In particular, the debt ratio of 2030 young adults is 25.5%, and the debt ratio of over-60s is 18.1%, accounting for 43.6% of total household debt last year. Bank of Korea announced that household debt increased 10.3% last second quarter this year comparing to last year same quarter, while individual disposable income increased 3.9% during the same period.

The ratio of household debt to disposal income is 172.4% which is the highest since the statistic has been reported (Bank of Korea, 2021b). In the situation that an economic downturn begins, a coin run trigger a household debt crisis. Therefore, regulators should warn of and manage risk contagion that can be caused by a coin run.

Second, securities regulation should be strongly introduced to the virtual asset market as in other countries such as the UK and the US (SEC, 2017; Kim, 2018; Kim, 2019). Most virtual assets are securities. Generally, securities law presumes the weak or semi-strong form of market efficiency hypothesis but the stock market is not fundamentally efficient. Therefore, mandatory disclosure is required, fraud-on-the-market theory applies, civil money penalty is charged and class action is approved. The same regulatory principles should apply to the virtual asset market as long as the assets are classified into securities. In particular, the civil money penalty could work as an incentive mechanism against fraudulent activities and remedy sources for consumer loss by those frauds.

Third, financial conduct regulation should apply to virtual assets especially those that are not classified into securities (EU, 2020). Virtual assets are of three types: securities, utility, payment. Most of them are the securities type that will be under securities regulation. However, the payment type and utility type should also be regulated by financial conduct regulation that focuses on the business conducts of exchanges in order to protect investors from fraudulent behaviors.

Fourth, a strict investor identification rule such as Know-Your-Customer (KYC) rule should be adopted in cryptocurrency transactions (Pieters and Vivanco, 2017; Pieters, 2018). Anonymity in cryptocurrency transactions seems to create both social costs and benefits, like two sides of a coin. On the one side, it creates high accessibility that reduces transaction costs, but on the other side, it creates big abusive utilizations of cryptocurrencies for frauds, tax evasion, and speculative investments. Cryptocurrencies like Bitcoin are not yet assimilated into a consistent global regulatory framework. Exchanges which do not identify their customers to establish accounts exhibit statistically different price patterns from exchanges that do. And there is evidence that users with criminal intentions use Bitcoin. For these users, the anonymity is its primary benefit. In order to prevent criminal intentions and fraudulent behaviors, a cryptocurrency wallet should identify its holders (Pieters and Vivanco, 2017).

Fifth, financial education should be imposed on exchanges as a mandatory duty. Financial education is a kind of investor-friendly mandatory disclosure of related information. Investors have rights to know information symmetrically about reality such as bitcoin and block-chain paradoxes, and the possibility of coin run and fraudulent schemes. Bitcoin paradox reveals a reality that volatility of bitcoin price disproves of its possibility as money, a standard medium of exchange and the volatility is inevitable unless centralized. Bitcoin argues from the beginning that it could be efficient money with non-centrality and will replace the central bank money that is controlled by centralized power. Block-chain paradox tells that if block-chain is more public and open, it is less efficient. It should be clarified that any story false or not that does not comply with fiduciary duty should not raise funds from investors. Financial education is a part of fiduciary duty and should be a pre-condition of virtual asset transactions.

Lastly, the Financial Consumer Protection Act of 2021 (FCPA 2021) should apply not only to traditional financial markets but also to the virtual asset market. There is no reason that the virtual asset market should be an exception of FCPA 2021. A virtual asset is also a financial product and any exception of FCPA 2021 will endanger the sound growth of virtual asset markets. Excessive speculation and fraudulent activities will be encouraged and expanded if FCPA 2021 does not apply to the virtual asset market.

V. Concluding Remarks

The first cryptocurrency is Bitcoin which was first mined in 2009. Since then, the number of cryptocurrencies skyrocketed to 12,180 as of September 28, 2021, and the market capitalization is 1.86 trillion dollars according to CoinMarketCap.com. When Bitcoin first appeared in the world, it aspired to become a decentralized money and would crowd out legal tender. However, as Bitcoin paradox proves, it failed to become even simple money as a medium of exchange, but it is abusively utilized for speculation and fraudulent activities. In the cryptocurrency market both issuers and investors are speculative. It is as if speculation meets speculation, and it becomes stronger

speculation. How to cut the speculation cycles is the most important policy challenge of regulators. The relative size of cryptocurrency seems smaller than that of the traditional securities market, but its absolute size is not trivially small and daily trading volume is bigger than in the traditional securities market. Seemingly paradoxically, even though it first proudly announced that it will be free money excluding central bank money, it now inevitably will have to embrace government intervention in order to control its rocky speculation and fraudulent activities to become stable assets. Nobody appreciates its current speculative volatility and involvement in fraudulent activities. Without integrity in the market, no virtual assets can be trustworthy and sustainable in the long run.

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InsurTech and Financial Consumer Protection*

Sojung Carol Park†

A B S T R A C T

Technologies are reshaping the insurance industry. Technologies are transforming the way insurers distribute, underwrite, manage products, and settle claims. Artificial Intelligence utilizes a wide range of data, and algorithms to access risks, target customers, and recommend products. It is not only that technological innovations improve the efficiency and lower frictions in each step of the value chain, but the industry is undergoing greater change. New market participants such as startups, Big Tech platform firms, manufacturers, and other service providers have entered the insurance industry in one way or another to serve their customers in the ecosystems. Although most changes seem to benefit financial consumers, the widespread and rapid change can create grey areas in financial consumer protection regulations, resulting in unexpected harm to consumers. In this study, I summarize current changes in the insurance industry and provide issues that call for supervisory attention in terms of financial consumer protection.

Keywords: InsurTech, Artificial Intelligence, Insurance, Financial Consumer Protection

Ⅰ. Introduction

Digital technologies disrupt and transform the global economy and every industry and reshape every aspect of our lives. The insurance industry, known to be relatively conservative, seems to be not an exception to this wave of changes this time. COVID-19 accelerated digitalization, and the real transformation of the insurance industry is not a story of the future. Startups such as Oscar Health, Lemonade, and Root are now publicly traded companies, and Ant Financial's mutual risk-sharing platform Xiang Hu Bao has more than a million participants.

The change driven by new technologies in the insurance industry is referred to as the term InsurTech. InsurTech is revolutionizing how insurance contracts are created, distributed, and managed. InsurTech is not limited to the digital transformation of the traditional insurance value chain such as digitalized distribution, AI-based underwriting and claim management, and personalized contracts. Insurance companies are reshaping their business to proactive management of risks and constructing risk ecosystems. Startups and big tech companies are expanding their ecosystems and reaching out to the insurance industry.

Thanks to the changes, consumers can be insured much more efficiently and effectively. Now we live in a world where consumers can purchase insurance policies in a few seconds and have claims settled and paid out in seconds. However, these bright sides came with potential issues. Old regulations in the insurance industry need new considerations to facilitate the change of enhancing consumer welfare and at the same time protect consumers thoroughly.

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† Professor of Finance College of Business Administration Seoul National University 1 Gwanak-ro, Gwanak-gu, Seoul, 08826, South Korea, Tel: +82-2-880-8085, E-mail: sojungpark@snu.ac.kr

Although most changes seem to benefit financial consumers, the widespread and rapid change can create grey areas in financial consumer protection regulations, resulting in unexpected harm. For example, there has been an abrupt regulatory interpretation change regarding insurance price comparison website in Korea. Insurance price comparison was considered as an advertisement which does not require agency license. This view was changed and caused confusion to Fintech firms and consumers. This case will be discussed in more detail in section III. In the era of a rapid structural shift, new incidents may continue to arise - some of which may result in serious consumer harm.

The changes in the industry are having a real impact resulting from the little attempts within the regulatory "sandboxes". It is about time to make serious revisions to the current supervisory systems in many countries. In this study, I summarize the recent changes in the insurance industry and provide issues that call for supervisory attention in terms of financial consumer protection. Section II summarizes the changes in the insurance industry and section III provides issues that call for supervisory attention in terms of financial consumer protection. Section IV concludes the paper.

Ⅱ. InsurTech

InsurTech, the word, is an abbreviated term for "Insurance Technology". NAIC (National Association of Insurance Commissioners) defines InsurTech as the innovative use of technology insurance and is a subset of FinTech, or financial technology. Ever since the first global Insurtech accelerator, Startupbootcamp, was initiated in London in 2015, investment in InsurTech increased rapidly (Alexander and Florian, 2017). According to CB Insights (2021), funding in InsureTech startups increased from $347 million in 2012 to $3.95 billion in 2018 and reached a record high of $7.1 billion in 2020. The funding fueled in this industry resulted in the birth of InsurTech unicorns. In the 2019 Fintech 100 list in KPMG and H2 Ventures (2019), 17 were InsurTech firms. Among them, the most highly ranked were the healthcare and health insurance companies Clover Health and Oscar Health. The Insurance price comparison website in India, PolicyBazaar, followed. A digital P2P insurer, Lemonade, a life insurance carrier, Singlife, a pay-per mile auto insurer Metromile, health insurer Collective Health, and a digital property and casualty insurer, ZhongAn, were also on the top list.

The changes in the industry were not limited to these emerging startups. Incumbents also transformed their businesses. Even before InsurTech or FinTech, Geico and Progressive sold auto insurance policies through online or mobile channels. Incumbent insurers introduced telematics-based pricing. Big Tech companies also stepped into the finance industry, including insurance. Notably, Amazon announced a joint venture with Berkshire Hathaway and JP Morgan to enter the healthcare industry in 2018. Although this ambitious attempt failed, this challenge increased great tension in the industry. Tesla started offering Tesla auto insurance to its consumers. Manufacturers are now showing their presence in the insurance industry.

Startups, incumbents, IT firms, and other participants in the insurance ecosystem have been reshaping the industry to lower frictions and enhance the consumer experience. As EY (2021) notes, insurance consumers felt underserved, and InsurTech helps cater to consumers' needs. The specific changes in the insurance industry are described with real examples below.

A. Digital Channels and the Entry of New Service Providers

Regardless of the type of products, the way people buy and sell things has changed rapidly. Traditionally, insurance agents and brokers met consumers in person and solicited, negotiated, and sold policies. This process required tedious, time-consuming paperwork and expected a long wait time for approval. With mobile and online channels available for various product lines, consumers can search and compare products easily, get quotes quickly, and purchase insurance policies almost immediately, entirely from mobile or computer without human interaction. For example, an InsurTech company Lemonade uses AI chatbot Maya in the purchasing process and Jim in the claim process. Frequent contact between insurers and consumers means higher friction costs for tedious work in the distribution channels. The repeatedly renewed and frequently claimed personal line policies such as auto insurance, renters' insurance, individual health insurance, and homeowners' insurance were the first products con-

verted into digital distribution. The recent success of Next insurance and Singlife shows that term life and SME business insurance products can be the expected products to be mainly sold digitally.

This transformation excluded agents from the distribution process and reduced insurance prices significantly. With digital policies creating the need for easy access to digital price and product comparisons, done by independent agents and brokers in the past, aggregators or price comparison websites gained popularity. PolicyBazzar in India, Insurify and the Zebra in the US, confused.com in the UK are well-known sites. According to Mckinsey & Company (2018), more than half of premiums written in the auto insurance policy in the UK were placed through aggregators in 2017. Platform companies that already have extensive digital account members like Grab in Indonesia, Alibaba in China, or Kakao in Korea can easily enter the distribution channel in various forms from simple lead-generators to MGAs (Managing General Agencies). Some other types of digital intermediaries provide advice and recommendations based on personal information, playing the role of financial advisors or private bankers. For example, Bomapp in Korea provides insurance concierge services. It analyzes the insurance policies owned, recommends purchasing or surrendering policies, and helps users make claims. A more comprehensive AI-based Robo-advisor financial advisory service also incorporates insurance consumption in their advisory service.

B. New Products: On-Demand and Embedded Insurance

Digital distribution enabled new types of insurance products to enter the market. Mini or micro policies are policies with small premiums and short coverage terms. These new types of products are expanding their markets. For example, ZhongAn, an insurance company in China, sold over several billion shipping return policies, costing only a few pennies per policy. Another example is travel insurance that covers medical expenses or other possible losses during traveling. People often travel without any coverage due to the tedious purchasing process, but now that travel policies can be obtained within seconds, anywhere, anytime, entirely from mobile, people can purchase needed protection more easily, reduce protection gap. Micro auto insurance coverages like Cuvva allow drivers to drive cars for the short term like a few hours. Although these coverages are considered micro, as the premium is very cheap due to the short coverage term, these are very meaningful coverages as auto accident loss can be quite significant if occurred. In Korea, one-day auto insurance that can be purchased very easily has become widely available recently.

These small policies can exist thanks to digital distribution which reduced transaction costs significantly. In order to facilitate market innovation, Japan modified the minimum capital requirement to a mere JPY 10 million (USD 90,000) for Small-Amount Term Insurance (SASTI) companies. As a result, over 100 companies offered SASTI products in 2020 in Japan (Toa Re, 2021).

Another type of insurance gaining popularity is so-called embedded insurance. Embedded insurance is a policy sold along with products or services. Examples are auto insurance embedded in ride-share services or mobile phone insurance bundled in new phone sales. Any product sellers or service providers who want to combine their products or service with an insurance policy for their consumers can offer these policies. Although most embedded policies are mini-insurance, such as a return shipping policy or micro-mobility insurance, some are more significant than others. Tesla started selling auto insurance to Tesla buyers in certain regions in 2019, opening the participation of manufacturers as important insurance distributors in insurance markets. Swiss Re and Daimler teamed up and launched a new company, Movinx, to offer auto insurance in 2020, and Ford and Toyota also offer their own auto insurance. Auto manufacturers have a contact point with car buyers with their cars having built-in telematics devices. An advanced understanding of autonomous safety features gives OEMs (Original Equipment Manufacturers) a competitive advantage in underwriting and claim management. As their competitive advantage is rather on the distribution channel, risk evaluation, and management, their firms entered the insurance market as MGAs (Managing General Agencies), rather than full insurance carriers. The most recent big deal regarding embedded insurance is the cyber insurance offered to Google Cloud customers by Google's partnership with Allianz and Munich Re. This embedded insurance market continues to grow and may become a game-changer in the future.

C. AI and Alternative Data-Based Risk Classifications and Claim Adjustments

Insurance was a data-oriented business to start with. The recent developments in Big Data, artificial intelligence (AI), and IoT device technologies advance the insurance industry in numerous ways. More and more firms are turning to automated underwriting solutions or fraud detection systems. Various data which was not traditionally used as an input often are also used in this process. These InsurTech solutions increase efficiency and accuracy.

Risk classification heavily relied on demographic characteristics or some other past usage data. Now firms can use various sources of data and even use dynamic real-time pricing. Metromile in the US and Carrot in Korea collect real-time driving mileage data using a plug-in device and charge Pay-per-Mile premiums. Progressive, Root and many other auto insurers reflect telematics-based driving behavior information in insurance pricing. Some health and life insurers also adjust premiums or benefits based on real-time behavioral data.

Advanced data analysis technology is also used in claim processing and fraud detection. Shift technology is a B2B firm supporting insurers' detecting fraud. According to Shift technology's website, Shift technology can detect pre-existing roof damages for homeowners' policies using satellite image data, and it can detect staged auto accidents using other auto accident-related variables with very high precision. As the number of processed claims increases, the accuracy may also rise. InsurTech firm Lemonade has a digitalized claim processing based on AI. Policyholders send a video through a chatbot describing the loss processed in real-time. The AI analyzes the video for signs of fraud and can quickly settle the claim in as little as 3 seconds.

D. Proactive Risk Management: From Payer to PayVider

The core business of insurance companies is collecting premiums, diversifying risks, and then paying out losses. Insurance contracts benefit policyholders by converting their risky cash flows to less risky or certain ones. Insurance, however, faces the well-known information problems of adverse selection and moral hazard. Advanced data analysis described in the previous section can reduce the information problems significantly. Equipped with various IoT devices and other technology, insurers can now observe and communicate with policyholders continuously after the inception of a contract. So, the behavior or action taken by consumers after the contract can effectively be observed and contracted into an insurance contract.

Insurers now seem to take one step further to simply reduce information asymmetry using digital technology. Insurers expand their business to the area of proactive management of risks. As most insurance policies have a partial risk transferring scheme, both insurer and insured benefit from reduced risks. That is, there exists an incentive alignment to control risks. Well-known examples are the Vitality program, adapted by many insurers globally. It incentivizes policyholders to reduce health risk by providing monetary rewards for healthy lifestyle choices such as walking 10,000 steps each day. The homeowners' insurance company Hippo installs smart home systems for free to reduce fire and theft risks at home. Auto insurance company Metromile tracks the location of stolen cars using a plug-in device and has recovered more than 90% of them.[1] As more and more insurers provide risk management services, insurers are becoming PayVider, a collaboration between the payer and service provider.

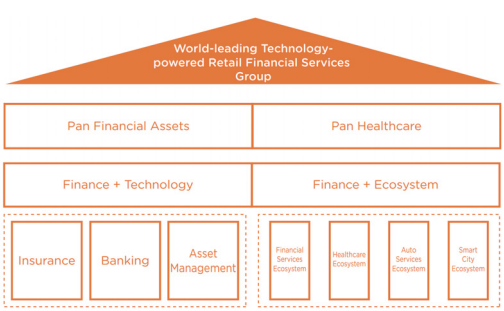
This transition is not unique to the insurance industry. IoT devices connect product manufacturers with their consumers. This trend of continuous communication with customers encourages all industries to adopt a customer-centric ecosystem strategy. Companies are empowered to provide high-quality personalized products and services that their target customers need. One example is servitization. Servitization refers to manufacturers combining their products with related services such as maintenance. Auto manufacturers seek more revenue by providing added services during the lifecycle of vehicles, and with the emerging market of fleet service, rideshare programs help convert manufacturers to mobility service providers. Traditionally, auto lending was the only financing area OEMs were involved in as the financing activity occurs at the inception of the transaction and promotes sales. Now that the interest of OEMs expanded to the entire life cycle of products, insurance and accident management can naturally become an interest of OEMs. E-commerce platforms such as

[1] This statistic is provided in Metromile's website. https://www.metromile.com/blog/stolen-car-recovered-oakland-metromile/ accessed in 2021-09-30

Alibaba, Amazon, and Naver providing loans to sellers on their platforms can also be similar examples of a customer-centric ecosystem strategy.

These ecosystem strategies blur the boundaries between industries. The definitions of financial products, financial consumers, and financial companies become obscure, calling for an extended range of regulatory targets for financial consumer protection. Companies traditionally belonging to different industries inevitably encounter this issue due to the convergence of products and various services. Partnerships, integrations, and competitions between seemingly unrelated companies occur frequently. ZhongAn (Ping An life, Alibaba, and Tencent), Movinx (Swiss Re and Daimler), and Carrot Insurance (Hanwha Non-life, Hyundai Motors, and SK Mobility) are a few examples. Invaded by many companies outside of traditional insurance companies, some insurers seriously transform their business into an insurance-company-centered ecosystem.

Ping An Life is one of the largest incumbent insurers in the world and experienced an unusual level of growth during the last decade. Its strategy is shown in Figure 1. Ping An's ecosystem strategy focus is on healthcare as it launched the Ping An One Doctor app, a comprehensive healthcare app offered to all consumers regardless of Ping An's financial product holdings. It shows the possibility of an insurance company-centered ecosystem. Recognizing this trend being inevitable, in Korea the Financial Service Commission (FSC)[2] announced a guideline allowing insurers to own non-financial companies as their subsidiaries in Dec. 2020. Shinhan life and KB Non-life insurance company in Korea immediately responded and launched a healthcare service through their newly formed healthcare subsidiaries in 2021.



Source: Ping An Life's annual report 2020

Figure 1. Ping An Life's Ecosystem Strategy

[2] Financial Service Commission is The Financial Services Commission is a government agency with the statutory authority over financial policy and regulatory supervision in Korea.

Ⅲ. Issues in Financial Consumer Protection

The digital transformation we are going through does not automatically translate to the shift from in-person solicitation to a mobile-based channel or AI-based automatic underwriting. It has more to do with the dynamic changes in the insurance value chain, participants in the industry, the changes in roles, new partnerships, new products, and new business models. It is a structural shift that requires significant changes in the regulatory framework for consumer protection. In this section, I discuss emerging financial consumer protection issues that call for regulatory attention.

A. New Intermediary Services: Focus on the Issues in Price Comparison Websites

The process of sales was simple in the past. Captive or independent agents sold policies to consumers. They provided comprehensive mediation services, compared and suggested policies, and completed the necessary paperwork. Insurers and policyholders typically communicated through these agents. The roles of human agents are being replaced by other digital channels, with disaggregation of functions and the addition of new roles.

The simplest example is insurance carriers selling policies directly through their digital channel. Removing commissions used to pay agents may cut insurance premiums, but consumers need to search and compare policies from multiple insurers on their own. To fill this gap, various types of price comparison websites or aggregators have appeared. Price Comparison Websites (PCWs) can reduce search costs for consumers and enhance competition and innovation in the insurance market. Some services provide quotes and only generate leads to the insurer's website or agents. Others give an exact price and even sign a contract. Some services analyze comprehensive customer data and provide recommendations and advice. MGAs are even involved in underwriting and some claim adjustment process.

These activities could be financial contract "mediation" and thus regulated by financial consumer regulatory bodies, but some activities may fall into a grey area. Recently Korea had a significant incident related with this issue. Kakaopay is a new FinTech firm providing service on KaKao talk, a messenger app used by over 90% of the Korean population. Taking advantage of its members, Kakaopay began offering various financial services, including insurance price comparison. However, this type of service never existed before in the traditional value chain of the insurance industry, so the service was unclear whether it should classify as an advertisement or mediation. The original interpretation of the regulation considered this service as a type of targeted advertisement, so a platform firm without an insurance producer license can provide the service. In September 2021, the Financial Supervisory Commission in Korea suddenly announced that the activity should be considered as a part of insurance mediation, which requires insurance agency license. The range and definition of "mediation" being unclear confused the market, and Kakaopay had to immediately end the service. Fintech firms like KaKaopay tried to acquire insurance agency license right away, but current regulation requires that at least 10 percent of employees of an insurance agency should be insurance agents. This requirement is very hard to be met by Fintech firms.

There were debates between Fintech firms and insurers on whether this service should be considered an advertisement or mediation. FinTech firms argued that the service is an advertisement as it simply compares policies and generates leads to the insurer's website. Insurers, on the other hand, viewed this as a mediation. Services considered as a mediation require the service providers to obtain appropriate business licenses and fall under the regulation of the Financial Supervisory Commission (FSC) in Korea. Advertisement, on the other hand, does not require a license from FSC. In September 2021, the FSC in Korea announced that this service should be viewed as mediation, resulting in the immediate discontinuation of these types of services from many service providers. Reflecting regulatory uncertainties and loss of business opportunity of platform companies, the stock price of KaKao plummeted from 156,000 Korean won to 116,000 Korean won in a few days.

This is not a unique problem in Korea, of course. The issue of new service providers called for the revision in supervising firms in the process of insurance distribution. In order to handle this issue, the European Parliament issued an Insurance Distribution Directive (IDD)[3]. Effective from October 2018, the member states of the European Union should comply with IDD, which replaces the Insurance Mediation Directive (IMD)[4]. Insurance distribution is "to sell, propose to sell, advise on or prepare in any other way the conclusion of insurance contracts." Replacing "insurance mediation" with "insurance distribution" was done to protect consumers regardless of the type of distributors in the distribution process. In the UK, where price comparison websites are widespread, the Financial Conduct Authority (FCA) set out a separate guideline for price comparison websites in 2011 to better accommodate and regulate PCWs (FCA, 2011).

The FCA, however, finds problems and concerns regarding PCWs, most notably that consumers focus too much on the pricing when they use PCWs, often leading consumers to policies that do not meet their needs. The FCA sent out letters to the CEOs of PCWs listing the concerns and noted that the FCA is developing a new supervisory strategy for PCWs for better financial consumer protection.[5] Marano (2021) also points out that the current IDD is not sufficient to regulate insurance distribution.

Although most discussions are on PCWs, other changes are also arising. For example, the embedded insurance market is developing fast. Often these policies are combined with other products or services and thus are almost invisible to consumers. The complexity of the distribution of insurance contracts is increasing. The way insurance contracts are "distributed" has been radically changed and is expected to continue changing. The reshaping of regulation needs serious attention to protect consumers and to enhance consumer welfare through innovation at the same time.

B. Risk Classification and Fraud Detection

Digital technologies like IoT, big data, and machine

[3] Directive (EU) 2016/97 of the European Parliament and of the Council of the 20 January 2016 on insurance distribution.

[4] Insurance Mediation Directive. Directive 2002/92/EC of the European Parliament and of the Council of the 9 December 2002 on insurance mediation.

[5] The letter can be found here: https://www.fca.org.uk/publication/correspondence/portfolio-letter-price-comparison-webiste.pdf accessed on 2021-09-30

learning are advancing the precision of risk classification. More precise risk classification increases actuarial fairness and reduces adverse selection problems. Better assessing risks greatly benefits both insurers and consumers. Consumers can have access to better products, personalized policies, and overall more affordable insurance. However, an important consideration is in rate making. In most states and developed countries, rating regulation forbids the usage of discriminatory factors such as religion, race, gender, and national origin. Prohibiting these factors has resulted in forced cross-subsidy. Unless these technologies create a rise in adverse selection that threatens market failure, this somewhat intentional coarse pricing scheme continues to be adapted.

But the usage of new technology may affect the anti-discriminatory risk classification framework. Precise risk classification and less cross-subsidy will create winners and losers, and the winners and losers may not be equally distributed. Fuster et al. (2021) shows the evidence for this. The study shows that Blacks and Hispanics are predicted to lose in the mortgage market when the rating model changes from a simple logit credit model to machine learning technology. The algorithm may successfully find hidden discriminatory traits.

While Fuster et al. (2021) proves that the change in the algorithm itself may have the effect of proxy-banned factors, the use of more information can cause serious problems. Lemonade uses AI technologies to process claims. Policyholders send video messages to a chatbot that analyzes them in almost real-time. In May 2021, Lemonade tweeted that its AI uses information on non-verbal traits collected from video calls such as customers' facial characteristics to deny claims. A backlash of negative public attention forced Lemonade to respond by retracting some of their comments.[6] If not properly regulated, incidents like this can occur where firms use both verbal or non-verbal, provided or inferred information to classify risks and detect frauds. Our behaviors in daily life can be tracked and priced in insurance premiums or loan rates unequally across races, religions, and genders.

Concerned about this issue, the EU's Fundamental Rights Agency issued a report on artificial intelligence and fundamental rights (FRA, 2020) suggesting that organizations using AI explain their AI systems and the decision-making process based on AI. A report by the European Commission (2020) on algorithmic discrimination in Europe also analyzes the problems, reviews good practices, and proposes the "PROTECT" framework as a set of key recommendations to be implemented in Europe.[7] Specifically for insurance consumers, IAIS (International Association of Insurance Supervisors) issued a report on the use of big data analytics in insurance (2020). The report notes that the advanced data analysis can limit the availability and affordability for certain consumer groups, and thus, supervisory actions should be taken to have a sufficient level of transparency and insurer accountability for customer outcomes based on algorithms. Some jurisdictions take conservative action towards this concern. The state of New York issued a letter in 2019 mentioning that "an insurer should not use external data sources, algorithms or predictive models in underwriting or rating unless the insurer has determined that the processes do not collect or utilize prohibited criteria and that the use of the external data sources, algorithms or predictive models are not unfairly discriminatory."[8] The letter also requires a valid explanation or rationale for using such technology and proper disclosure of the algorithm and data contents.

C. Regulating AI Advisors

AI is not only used in internal risk assessment but also used as a Robo-advisor. Robo-advisors have direct interactions with consumers and substitute some functions of humans. These "advisors" can play their role in various distribution channels, not limited to online or mobile. Robo-advisors can take over the entire function of a human advisor, but they may conduct parts of the agents' role and help human agents in the process of distribution. In Korea, AI alone cannot be an insurance producer as

6 Lemonade tweeted that "1. AI that uses harmful concepts like phrenology and physiognomy has never, and will never, be used at Lemonade. 2. We have never, and will never, let AI auto-reject claims. Here's why: We do not believe that it is possible, nor is it ethical (or legal), to deduce anything about a person's character, quality, or fraudulent intentions based on facial features, accents, emotions, skin-tone, or any other personal attribute." https://www.lemonade.com/blog/lemonades-claim-automation/ accessed on 2021/9/29

7 The PROTECT proposal can be found in page 12 of European Commission (2020).

8 The letter can be found here: https://www.dfs.ny.gov/industry_guidance/circular_letters/cl2019_01 accessed on 2021/09/30

it is not a legal person. However, the FSC announced in May 2021 that producers are allowed to use Robo-advisors in telemarketing channels to explain insurance products. As more algorithms utilize individual data to give advice and recommendations, the roles of Robo-advisors will continue to rise.

Insurance agents and brokers need to acquire an appropriate license, and they are liable for their misconduct. When human-like Robo-advisors interact with consumers in the distribution process, misconduct issues may arise, just like with human agents. We need to set standards for algorithms substituting human roles and clarification for who should be held liable in the case of misconduct.

The issue of liability regarding AI is part of a much broader discussion out of the insurance industry. AI is substituting for drivers, doctors, and many other human roles. Although it performs these roles, AI is a product under current law. But unlike other products, AI can learn itself, make autonomous decisions, and act and interact independently without human control. When multiple humans are involved in controlling AI, grey areas for liability may exist.

As the usage of AI is expected to increase, new thoughts on the legal status of AI have emerged. The European Parliament stated that we are allowed to create a specific legal status of electronic persons to be given to AI.[9] This statement brought up fierce criticism and debates. In 2019, European Union (2019) expressed a view denying the necessity of adopting "electronic personhood." Bertolini (2020) provides more analytic discussions on the notion of "electronic personhood." Although it is evolving and developing, the dominant opinion on the current legal status of AI is that AI is not a legal person. The AI guideline by European Commission (2019) states that "the manufacturer can be liable even if the defect was caused by changes made to the product under the producer's control."

Clarifying the subject of liability and providing guidelines for the usage of AI seems to be an absolutely necessary condition for utilizing Robo-advisors in the distribution channel of financial products.

[9] European Parliament resolution of 16 February 2017 with recommendations to the Commission on Civil Law Rules on Robotics (2015/2103(INL)., paragraph 59.

Ⅳ. Conclusion

With the accelerating technological developments and changing consumer expectations, I believe that the insurance industry will continue evolving. This innovation can certainly benefit consumers; risk management and risk sharing will become more efficient and more customer centric. However, the significant level of structural change that is currently taking place -where the type of value chain and market participant changes along with the change in the service and product provided by insurers, and where algorithms play significant roles - requires a significant level of change in the regulations for consumer protection as well.

In this paper, I have summarized the main changes taking place in the insurance industry and provided major issues that call for the attention of supervisors to redefine the scope of financial products and the range of licenses and regulations by the financial supervisory bodies. Ethical norms for complex technologies such as AI will minimize regulatory uncertainties and thus promote further innovation while protecting financial consumers.

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FinTech Megatrends: What Welfare Implications Can We Draw for Financial Consumers?

Man Cho†

A B S T R A C T

This study aims to assess the welfare implications of the FinTech service providers on financial consumers, by focusing on one particular subsector - the online capital-raising activities (CRA) including P2P lending and crowdfunding. To that end, the key arguments advanced by the recent studies are synthesized as follows: Thanks to the rapid deployment of online platforms and digital data in recent years, the CRA service providers have greatly enhanced intermediation efficiency, which results in lower transaction cost and heightened convenience for financial consumers, and have also extended financial inclusion for marginal borrowers in both developed and developing countries; These alternative service providers tend to narrow the credit gap caused by information asymmetry between borrowers and lenders by utilizing soft data for ex ante credit evaluation; However, some concerns are raised as to the likelihood of over-leverage by certain segments of P2P platform borrowers as well as the heightened risk of cyber-crimes such as identity theft and voice phishing. Based on these findings, policy implications as to designing effective measures of financial consumer protection, both from demand-side and supply-side of the CRA service sectors, are discussed.

Keywords: FinTech, Online Capital-Raising Activities, Financial Consumers, Information Asymmetry

Ⅰ. Introduction

The traditional branch-based banking is under attack, as non-banking firms of various kind have been expanding their financial services backed by digital technologies and data in the recent years. As cases in point, the size of the online capital-raising services in the world, i.e., P2P lending and crowdfunding, increased from $11.7 billion in 2013 to $301.7 billion in 2018, a 25-fold growth within five years. (Cambridge Center for Alternative Finance (CCAF) 2020) In addition, the alternative payment and settlement mechanisms (alternative to fiat money) such as mobile payment platforms and cryptocurrencies are rapidly spreading across the globe, as evidenced by the fact that the mobile payment volume in China reached 16 percent of GDP in 2018. (Frost et al. 2019) And similar phases of rapid expansion in other alternative financial services are also observed in the investment consultancy (via robo-advisors) and the regulatory compliance (via RegTech). The growth of these innovative, and also disruptive, financial technologies (generally referred to as FinTech) is expected to continue in coming years given the on-going advancement in underlying technologies and data analytics.

The sector is highly diverse and evolving. To illustrate, the supply-side of FinTech includes firms in varying types and sizes, e.g., start-ups, SMEs, and BigTechs, that involve with the related businesses of internet and mobile platform

† KDI School of Public Policy and Management 263 (Korea Development Institute) Namsejong-ro, Sejong-si 30149, Korea
Tel: +82-44-550-1280, Fax: +82-44-550-1240,
E-mail: mancho@kdischool.ac.kr, http://www.kdischool.ac.kr

operation, technology and infrastructure development, and data processing and analysis. The funding sources, or investors, include both individuals (or households) and institutions (e.g., banks, pension funds, mutual funds, and family offices), the shares of which also vary widely across countries and geographical areas.[1] In terms of the use of funding, the non-collateralized lending to consumers and small businesses takes a majority share in most countries, but more diverse uses are observed in countries like the United Kingdom (U.K.), e.g., debt- and equity-financing for property acquisition, mini-bond issuance, pension-led funding, invoice trading, microfinance, and community project funding. Given this backdrop, this study aims to assess the welfare implications of one particular FinTech sector on financial consumers - the online capital-raising services (P2P lending and crowdfunding of various types) by synthesizing the arguments advanced by recent studies.[2]

In a broad sense, the FinTech sector represents the financial market version of digital transformation, for which the recent literature documents three broad categories of expected welfare gains (as elaborated in Section 3): (1) the platform effect that reduces transaction costs in service delivery and, at the same time, accumulates digital data through internet or mobile platforms; (2) the prediction power effect that lowers the error in selecting an optimal production technology or business model; and, (3) the new analytics effect that expands the scope of empirical analyses to various alternative (or non-conventional) data enabled by the AI-driven new analytical methods.

In the case of the FinTech CRA service providers, four particular welfare implications have emerged in the literature: first, those online service providers deliver services to financial consumers with a much cheaper, faster, and more convenient intermediation process based on an internet or mobile platform (IMF 2017, Buchak et al. 2017, Fuster et al. 2018, Frost et al. 2019, Jagtiani and Lemieux 2019, OECD 2019, FSB 2019); second, they are shown to be reducing the information asymmetry by collecting and utilizing various types of soft data for ex ante credit evaluation (e.g., social or friend network, digital footprint, location of borrower, and indicators of trustworthiness), which helps grasp a fuller and more real-time picture of borrowers' creditworthiness (Lin et al. 2013, Iyer et al. 2016, Puri et al. 2017, Hildebrand et al. 2017, Freedman and Jin 2017,Berg et al. 2020); third, the CRA service providers are shown to be "bottom-fishing" in the scale of creditworthiness, i.e., serving those borrower segments or geographical areas that are left out by existing financial institutions due to low credit scores or no or insufficient credit history (so-called "thin filers") (Jagtiani and Lemieux 2018, De Roure et al. 2018); and, finally, the rise of the FinTech sector in general also increases the incidences of illegal or fraudulent financial transactions, such as cyber-thefts, voice phishing (i.e., fishing private information for the purpose of demanding money transfer through mobile phone or other means), ponzi schemes for fake private equity funds, and "darknets" (platforms for illegal online transactions based on crypto-currencies) (Wellicz 2016, Foley et al. 2019).

As to the financial consumer protection (FCP), three policy implications are elaborated given the survey. First, the FCP measures should be designed to tame specific behavioral patterns that are frequently observed from the financial markets, e.g., pro-cyclical lending, misrepresentation or incomplete sales, overleverage by liquidity-constrained financial consumers, and herd behavior or uninformed investment by liquidity-surplus financial consumers. Second, as to the information provision to financial consumers (on product or service details), doing so in a timely and understandable (to financial consumers) fashion should be an important principle to stick to, as emphasized by recent studies. Third, on the supply-side, strengthening financial supervision of CRA service providers, both for their ex-ante (before point-of-sale) activities and for ex-post regulatory requirements to incentivize them to treat consumers fairly and ethically, is very much warranted.

The rest of the paper consists of the following five sections: the underlying trends of relevancy (Section II), the implications of digital transformation (Section III), four welfare implications for financial consumers (Section IV), policy implications as to the measures of financial consumer protection (Section V) and concluding remarks (Section VI).

[1] For example, while the share of the institutions in the total P2P lending and crowdfunding in the U.S. amounts to 88%, it is much lower in others (50% in U.K., 49% in Latin America, 41% in Europe (ex. U.K.), 36% in Asia Pacific (ex. China), and 19% in Africa) (CCAF 2020).

[2] To the extent relevant, the issues relevant to the mobile payment sector will also be covered.

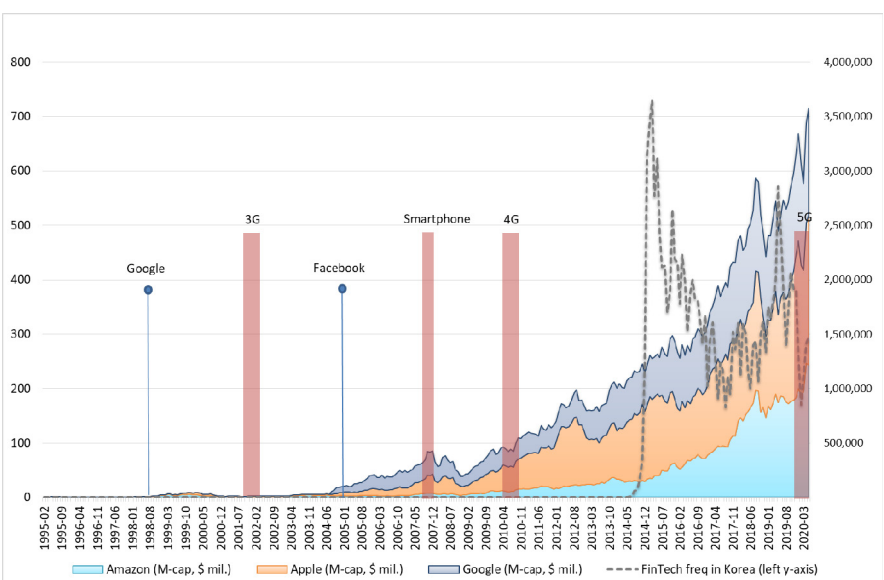
Ⅱ. Underlying Trends of Relevancy

A. The Advancement of the Digital Technologies

Innovations in the financial service sector date back to the 13th century when the paper check was first introduced, a disruptive technology that fundamentally changed the ways of financial and non-financial transactions being settled. Since then, a series of other innovations occurred over time, including double-entry book keeping (1400s), telegraph (1800s), credit card (1950s), Automated Teller Machine (ATM) (1970s). During the last three decades, however, the intensity of innovations in the sector driven by the digital data and technologies, often termed as digital transformation, finds no match with any historical period. In particular, they start from World Wide Web (www) invented by the English scientist Berners-Lee in 1989, followed by the wireless communication technologies (1G in the 1980s, to 3G in 2002 and to 5G right now) and, more recently, iPhone and other brands of smartphone from 2007. Thanks to these recent innovations, the market capitalizations of the leading web-based global corporations (e.g., Amazon, Google, and Apple) have been steeply rising during the last two decades (see Figure 1).

While the recent innovations in the financial service sector propelled by the digital transformation appear to have started from 1990s in the U.S. and other advanced economies, most emerging market countries tend to lag in riding on the innovation cycle. Taking Korea as an example, the internet subscription rate was fairly low throughout the 1990s (only 5.7 percent among the adult population in 1998), which has steeply increased in the subsequent years (about 80 percent in 2008). And the media coverage of the term FinTech rose sharply around 2015, the same time as the introduction of the first mobile payment service (KakaoPay) in the country (Figure 1).

In contrast, the U.S. financial service industry implemented various online B2B and B2C systems from the mid-1990s, which have evolved into the current FinTech lending platforms. One such example was the Automated Underwriting System (AUS) used by the residential mortgage finance industry in the U.S. from the mid-1990s, an online document validation and credit evaluation system that delivered a substantial efficiency gain for both consumers and financial intermediaries but, at the same time, worked as a mass production mechanism of the high-risk



Source: Author

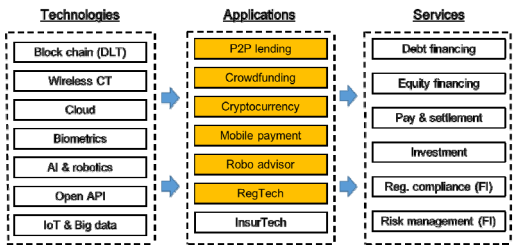
Figure 1. Evolution of Technologies, IT Firms, and the Emergence of FinTech (in Korea)

subprime mortgage contracts prior to the financial crisis.[3] As an enhanced version of AUS, the FinTech mortgage lending platforms are expanding their business volumes in recent years, which are shown to be faster in processing loan applications with comparable outcomes in credit evaluation (assessed by the ex-post delinquency rates) with the conventional offline lending channels (Fuster et al. 2018). The phase of innovation in this FinTech sector has recently been accelerating thanks to the introduction of other digital technologies (e.g., AI, IoT, Cloud, Big Data, Block Chain), with the early examples of the service providers including Prosper (established in 2005 in the U.S.), ZOPA - Zone of Possible Agreement (in 2005 in U.K.), and Lending Club (in 2006 in the U.S.).

On the other hand, the FinTech lenders in the emerging market countries began their operations in more recent years. For example, the leading Chinese lending platforms started around 2014, e.g., iZhongchou (from 2014 and affiliated to Alibaba), and QQ Gongyi (from 2014 and affiliated to Tencent); In the Korean case, it was around 2017 when a number of the P2P and crowdfunding platforms were established, and there are also three "internet-only" (with no branch network) banks that are in operation as of today - K-Bank (from 2017 and affiliated to the mobile phone servicer Korea Telecom), Kakao Bank (from 2017 and to the chatting app and e-commerce company, Kakao), and Toss Bank (from 2021 and affiliated to the first FinTech unicorn[4] from the country).

B. The Global Trend of Online Capital Raising Activities (CRA)

The concept of FinTech is still evolving, as indicated by the varying definitions introduced in the literature.[5] To our end, FinTech is simply defined as those financial services enabled by innovative technologies and digital data that potentially supplement or replace human-based services in the financial service sector. As shown in Figure 2, the FinTech services utilize a diverse set of technologies, cover pretty much all major categories of financial service to consumers and business entities, and are also applied to the back-office functions such as regulatory compliance and risk management.[6] This study focuses on the online capital raising services (P2P lending and crowdfunding of various types), and, to the extent relevant, the mobile platform-based payment and settlement services.



Source: Author

Figure 2. Technologies and FinTech Services

The online capital-raising activities have been proliferating in recent years, which can be differentiated by platform characteristics (Market Place Lending, MPL, vs. Balance Sheet Lending), funding type (equity-financing, debt-financing, and reward or donation), borrower type (consumer vs. business entity), capital-raising purposes, and so on. As to the taxonomy, CCAF (2020) classifies those online platforms as: (1) P2P MPL Lending (to both consumers and SMEs without its own capital); (2) P2P Balance Sheet Lending; (3) Investment-based Crowdfunding (e.g., equity-based, real estate collateral based, and profit-sharing based capital raising with or without the platform's own capital); (4) Non-investment-based Crowdfunding (e.g., reward-based, and donation-based); and, (5) various other services (e.g., invoice trading, mini bonds, debt-based securities, community shares, pension-led funding, and crowd-led microfinance).[7]

[3] AUS in the U.S. greatly reduced time and cost for mortgage borrowers but, later on, also worked as a mass production mechanism for the subprime and Alt-A mortgage loans. See Cho (2007) and (2009) for further discussion on AUS and its role in the subprime mortgage debacle.

[4] A non-listed SME whose asset exceeds one billion USD.

[5] FinTech is alternatively defined as: an application of technology within the financial industry (Barberis 2014); a new financial industry that applies technology to improve financial activities (Schueffel 2016); and, a cross-disciplinary subject that combines finance, technology management, and innovation management (Leong and Sung 2018).

[6] But this list is far from being exhaustive in that it omits certain sectors that should be regarded as parts of the FinTech industry, e.g., InsurTech, SupTech, and PropTech, along with various infrastructure service providers.

[7] There are also two other types of service providers that can be included in the FinTech industry - the internet-only banks (Rakuten Bank, Go Bank, WeBank, KakaoBank, K-Bank), and the mobile-only banks (Monese 2015, Revolut 2015, Starling Bank 2017).

As shown in Table 1, the sector exhibits an explosive growth in the recent years, from $11.7 billion (USD) outstanding funding volume globally in 2013 to $301.7 billion in 2018. However, the volume declines by 27.6% from its 2017 level of $417 billion. In terms of the geographical breakdown, China leads the sector with 71.4% market share, followed by the U.S. (20%), U.K. (3.4%), Europe excluding U.K. (2.6%), Asia-Pacific excluding China (2%), Middle East (0.3%), and Africa (0.1%). The drop in the volume in 2018 was solely caused by China, which experienced a 40% decline for the year; but other parts of the world show a strong and sustained growth in 2018 with some of them recording a three-digit annual growth rate. As expected, the standard deviation of the annual growth rates is highest in China with 89%, whereas those for other areas are much lower (e.g., 2% in U.K., 7% in Asia-Pacific ex. China, and 12% in the U.S.), indicating a steady growth of the sector globally except in China.

The P2P MPL Lending to Consumers represents the largest subsector in most areas (except U.K.), having a 64% share in the global outstanding funding volume in 2018. However, as shown in Table 2, a wide variation is observed across the countries/regions as to the composition of the sector: that is, two particular subsectors in China - P2P MPL to Consumers and that to Businesses - make up almost the whole market in the country (96% in total); in the U.S., on the other hand, the total Balance Sheet Lending (48%) is comparable to the total MPL (46%); and, a more evenly-distributed composition is observed from U.K., with relatively high shares of P2P MPL Property (17%), Invoice Trading (8%), and equity and real estate Crowdfunding (8%). The U.K. result indicates that this online capital-raising service has penetrated to more diverse segments of the financial market, compared to other regions/countries. The divergence in the composition observed seemingly represents consequences of differing financing needs and financial sector characteristics in those geographical areas.

The mobile-phone based payment turns out to be a powerful substitute to the existing means of exchange (e.g., fiat money and credit card) in both developed and developing countries. This alternative payment channel is offered by a number of global ICT or e-commerce

Table 1. Total online alternative finance volume for capital-raising activities

(a) Outstanding volume (million USD)

	2013	**2014**	**2015**	**2016**	**2017**	**2018**
China	5,600	24,300	102,200	243,300	358,300	215,400
USA	4,400	11,560	28,400	34,530	42,810	61,140
Europe(ex.U.K.)	400	800	1,100	2,300	3,800	7,700
Asia-Pacific (ex.China)	100	300	1,100	2,000	3,600	6,100
Middle East	36	91	159	177	347	801
Africa	44	61	83	182	104	209
Global	11,680	40,112	137,942	288,689	417,061	301,750

(b)Annual growth rate (%)

	2014	**2015**	**2016**	**2017**	**2018**	**μ(16~18)**	**Σ(16~18)**	**CV**
China	334%	321%	138%	47%	-40%	48%	89%	0.54
USA	163%	146%	22%	24%	43%	29%	12%	2.53
U.K.	173%	63%	27%	31%	28%	29%	2%	13.84
Europe (ex. U.K.)	100%	38%	109%	65%	103%	92%	24%	3.90
Asia-Pacific (ex. China)	200%	267%	82%	80%	69%	77%	7%	11.54
Middle-East	153%	75%	11%	96%	131%	79%	61%	1.29
Africa	39%	36%	119%	-43%	101%	59%	89%	0.67
Global	243%	244%	109%	44%	-28%	59%	40%	4.90

Source: CCAF (2020)

Table 2. Share of different alternative finance services within each country/region (%; As of 2018)

	China	USA	U.K.	Eur. (ex.U.K.)	AP (ex.CH)	Middle East	Africa	LAC	Global
P2P MPL, consumers	76%	42%	20%	38%	16%	12%	54%	27%	64%
P2P MPL, business	20%	3%	24%	13%	29%	6%	9%	8%	16%
P2P MPL, property	1%	1%	17%	2%	11%	69%	0%	3%	2%
Balance Sheet, consumers	0%	12%	6%	1%	14%	0%	0%	9%	3%
Balance Sheet, business	3%	20%	8%	1%	15%	1%	22%	16%	7%
Balance Sheet, property	0%	16%	1%	18%	0%	0%	0%	1%	4%
Invoice Trading	0%	0%	8%	10%	2%	6%	0%	34%	1%
Crowdfunding, equity	0%	1%	5%	4%	3%	4%	1%	1%	0%
Crowdfunding, real estate	0%	3%	3%	8%	4%	0%	2%	2%	1%
Others	0%	2%	8%	6%	6%	1%	12%	0%	1%
Total	100%	100%	100%	100%	100%	100%	100%	100%	100%

Source: CCAF (2020a)

companies, such as Google Pay, Amazon Pay, and Apple Pay (obviously by Google, Amazon, and Apple, respectively), Messenger Pay by Facebook, Alipay by Alibaba (via its affiliate Ant Financial), TenPay by Tencent, Baidu Wallet by Baidu, Samsung Pay by Samsung, M-Pesa by Vodafone (used in Kenya and other African countries), and Mercado Page by Mercado (used by Argentina and other Latin American countries). As of 2018, the yearly mobile payment volume as a percent of GDP amounts to a staggering 16% in China, far higher than other countries (0.6% in the U.S. and in India, 0.3% in Brazil, and 0.1% in U.K.) (Frost et al. 2019).

Ⅲ. Implications of the On-going Digital Transformation

As to the implications of digital transformation to an economic system as a whole, there has been an increasing volume of academic studies on the topic during the last several years. The key focuses of their inquiries include the role of the new breed of digital technologies that enable collecting·sharing·analyzing digital data through internet or mobile platforms (e.g., ICBM - IoT, Cloud, BigData, AI and Machine Learning, and other online platform related technologies), and the expected benefits (or welfare gains) and costs (or risks) involved with the advancement of these technologies. In particular, three anticipated social effects of the on-going trend of digital transformation (DT) are documented.

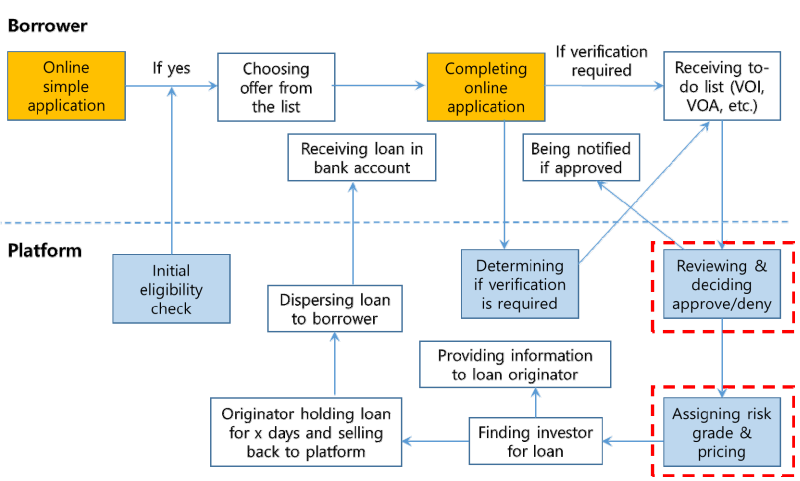
First, the platform effect of DT can substantially reduce the transaction costs in service provision (compared to the traditional offline services), which can enhance the welfare of consumers in general. At the same time, the platform operator can accumulate various digital data on consumer behavior, which can be utilized for product development and risk management. In the financial service sector, the platform effect can result in a diminishing role of the existing service channels (along with a reduction in workforce), which is termed as disintermediation in the sector (Philippon 2015, 2016, Park et al. 2021). Another anticipated outcome of the platform effect, as documented in the literature, is an increased cyber-risk (e.g., voice-phishing and other cyber-crimes).

Second, on the viewpoint of individual firms, the prediction power effect of DT (i.e., reducing prediction error in selecting an optimal technology or business model thanks to increased quantity of data accumulated) can result in an increase in production productivity and the quality-adjusted output (Farboodi and Veldkamp 2021). The study further argues that this prediction power effect tends to be larger (or increasing returns to scale) for smaller firms (e.g., start-ups) or when the level of data accumulation is low. In a related vein, other studies demonstrate that accumulating more data tends to: increase the accuracy in predicting business cycles (Ordonez 2013, Fajgelbaum et al. 2017); raise the predictive power in assessing the credit risk in the lending sector and, hence,

reduce the cost of capital for business borrowers (Begenau et al. 2018); and, lower the importance of collateral for household borrowers due to the heightened accuracy in evaluating the credit risk (Gambacorta et al. 2020).

Third, the new analytics effect of DT implies that the AI-driven analytical methods (e.g., ML and DL - Machine Learning and Deep Learning) allow use of both conventional and non-conventional data for scientific inference. For example, there are empirical studies that utilize satellite pictures to forecast economic activities in certain geographical areas, use tax reports (10K Reports for business entities) to categorize, and assess performance of, firms, or use external aesthetic views of buildings in property valuation.[8] There are also AI-based new analytical methods (e.g., regression trees, LASSO, random forests, ensemble) as well as software packages that facilitate their uses (R, Python). These new analytics, as argued by Mullainathan and Spiess (2017), influence the way that empirical analyses are performed in economics and other academic disciplines. That is, while the typical empirical investigation via an econometric model is in general deductive (i.e., a top-down approach that starts from a theory and proves/disproves a hypothesis derived with regression coefficient estimated $\hat{\beta}$, by assuming a particular model specification), the process of inquiry with the AI-based analytical methods tends to be inductive (i.e., a bottom-up approach that automatically tests a large number of permutations among explanatory variables and searches a model that minimizes the error term, $\hat{\epsilon}$).

In the context of the online CRA services, the above three effects of DT boil down to an enhanced risk assessment performed by the platform service providers. As illustrated in Figure 3, the FinTech lending process starts with an online loan application by a prospective borrower. Upon the completion of the application, the platform makes a soft credit check into the borrower's credit history and pulls the borrower's credit score, debt, credit utilization ratios, the number of accounts under the borrower's name, and the outstanding balances on these accounts. Using both the self-reported data and the credit report, the platform makes two main decisions: first, an approval-denial (underwriting) decision based on the documents and data compiled for credit risk assessment (on loan amount, loan purpose, income, wealth, credit history, various ratios, and so on); second, an appropriate risk premium based on which the investors can bid (i.e., pricing decision). In performing these functions, the platforms increasingly use soft data, i.e., various types of nonconventional data that are traditionally not used by financial intermediaries, which will be elaborated in the next section.



Source: Frost et al. (2019), p. 12; Revised and re-produced based on the original source

Figure 3. A Typical Online Intermediation Process

[8] See Mullainathan and Spiess (2017) for a survey of those studies.

Ⅳ. Welfare Implications for Financial Consumers

A. Enhanced Intermediation Efficiency

For the purpose of defining the concept of intermediation efficiency, suppose that a profit-maximizing service provider in the financial market has the following objective function:

$$(1)\quad EY_t = r_t^l - r_t^f - \delta_t - E_t\left[Loss_{t+k}\right]$$

where EY_t is a short-term excess yield (from its per-period operation), r_t^l is a lending rate (an average across all loans issued during a given time period t), r_t^f is a funding rate (or an average risk-free rate for comparable maturities for the loans made), and δ_t is a per-period operational cost expressed as a percent to each dollar lent. The last term in the right-hand side, $E_t\left[Loss_{t+k}\right]$, represents an expected credit loss that can happen in future (time t+k) and is evaluated today (time t).

EY_t represents an indicator of the efficiency in financial intermediation, and, ceteris paribus, the lower EY for a given financial service sector (or for an individual service provider), the more efficient (the more welfare-enhancing for financial consumers) its intermediation is. In the case of the U.S. Philippon (2015) demonstrates that EY_t for the financial service sector as a whole has been consistently and unjustifiably high since the early 1980s, for which he refers to the increased market power of the large financial institutions (FIs) through the active mergers-and-acquisitions from the early 1990s as a possible reason. In a follow-up study, he also claims that those existing FIs did not properly reflect the reduction in the operational cost, δ_t, caused by the automation and other data·ICT-driven innovations related to the intermediation process, and that the FinTech service providers potentially enhance the intermediation efficiency in the whole financial service sector by posing a heightened levels of competition and contestability, which is often labeled a “catfish effect” (Philippon 2016).

In fact, a number of studies document that the FinTech lenders enhance the intermediation efficiency by lowering transaction costs in delivering their services vis-à-vis the traditional branch-based financial institutions, mainly through much cheaper, faster, and more convenient internet or mobile platforms (IMF 2017, Buchak et al. 2017, Fuster et al. 2018, Frost et al. 2019, Jagtiani and Lemieux 2019, OECD 2019, FSB 2019). As an empirical evidence based on the household-level micro data, Fuster et al. (2018) report that the FinTech mortgage lenders in the U.S., those who provide an end-to-end online service from data entry to pre-approval (e.g., QuickenMortgage, LoanDepot.com, and Guaranteed Rate), process the loan applications about 20% (or 10 days) faster than non-FinTech lenders with comparable ex-post default rates. They also document that those online lenders are more elastic in responding to exogenous mortgage demand shocks than their counterparts, deliver a bigger efficiency gain for refinancing mortgage applications (14.6 days faster on the average) than purchase loan applications (9.2 days faster), and work as a more efficient transmission mechanism of monetary policy compared to the conventional mortgage lenders.

B. Reduced Information Asymmetry

1. On the Type A and Type B information asymmetries

Information asymmetry, and credit rationing as a consequence thereof, have long been a topic of investigation in the finance literature (Stiglitz and Weiss 1981, de Meza and Webb 1987, Waller and Lewarne 1994). The theory goes that, like in a used car market, a borrower knows more about his own credit quality (i.e., likelihood of repaying principal and interest as contracted) than a lender; and, as the risk premium (a proxy for $E_t\left[Loss_{t+k}\right]$) goes up to reflect a higher expected credit loss if and when the borrower defaults, low-risk borrowers self-select out of the credit market, causing an adverse selection problem for the lender. Knowing that an increase in the lending rate, r_t^l, to reflect a hgher risk premium will cause a faster drop out by low-risk borrowers than by high-risk ones, at a certain level of expected credit loss, the lender either reduces or even stops credit supply, which results in a credit gap (or excess demand) in the lending market.

A solution to the above type of information asymmetry, to be labeled as “Type A Info-asymmetry,” is a separate, rather than a pooled, equilibrium: that is, if a service provider is capable of measuring segment-specific risk levels (for high-risk vs. low-risk consumers) and of reflecting them in underwriting and pricing decisions, then the

above-mentioned possibility of adverse selection and credit rationing can disappear. The implication of this risk-based consumer segmentation and pricing goes beyond the efficiency in risk assessment in that such supply-side behavior can expand financial service to marginal consumer segments (e.g., borrowing-constrained households in lending market, and those excluded from a particular type of insurance contract). In fact, more accurate risk assessment and charging actuarially-fair risk premiums can actually enhance the welfare of marginal borrowers in that they are more likely to be included in formal financial service sector and are less likely to be steered to a more costly, or even informal, service sectors (i.e., 2nd- or 3rd-tier FIs for which consumers must pay much higher interest rates).

However, the asymmetry can go the other way when financial consumers are disadvantaged in understanding arcane financial products in terms of their risk-return profiles. In fact, it is well-documented that financial consumers in general tend to be myopic, present-time biased, and lacking even basic understandings of financial products (Miles 2004, Campbell 2006, Campbell et al. 2011). Hence, they are vulnerable if a profit-driven service provider sells a product by charging an excessive amount of risk premium or by misrepresenting embedded product risk (i.e., under-stating the expected credit risk or over-charging for underlying risks. The general solution to this problem, to be labeled as "Type B Info-asymmetry," is to make a leveled playing field between service providers and financial consumers, through appropriate (or effective) financial education programs on the demand-side and various legal and regulatory requirements on the supply-side, which is the focus of discussion in Section 5.

2. On the use of soft data by FinTech service providers

The finance literature has long been arguing that gathering "soft" information about credit quality of borrowers beyond credit scores and standard ratios are critical to reduce the credit gap caused by information asymmetry and to derive successful lending outcomes[9] (Fama 1985, Granovetter 1985, Petersen and Rajan 1994, Uzzi 1999, Agarwal and Hauswald 2007, Petersen and Rajan 2002). A growing number of studies documents that the FinTech service providers are capable of doing that, i.e., collecting and utilizing "soft data" to grasp a fuller and more real-time picture about consumers' financial lives and their creditworthiness (Iyer et al. 2009, Lin et al. 2013, Puri et al. 2017, Hildebrand et al. 2017, and Freedman and Jin 2018; Berg et al. 2020).

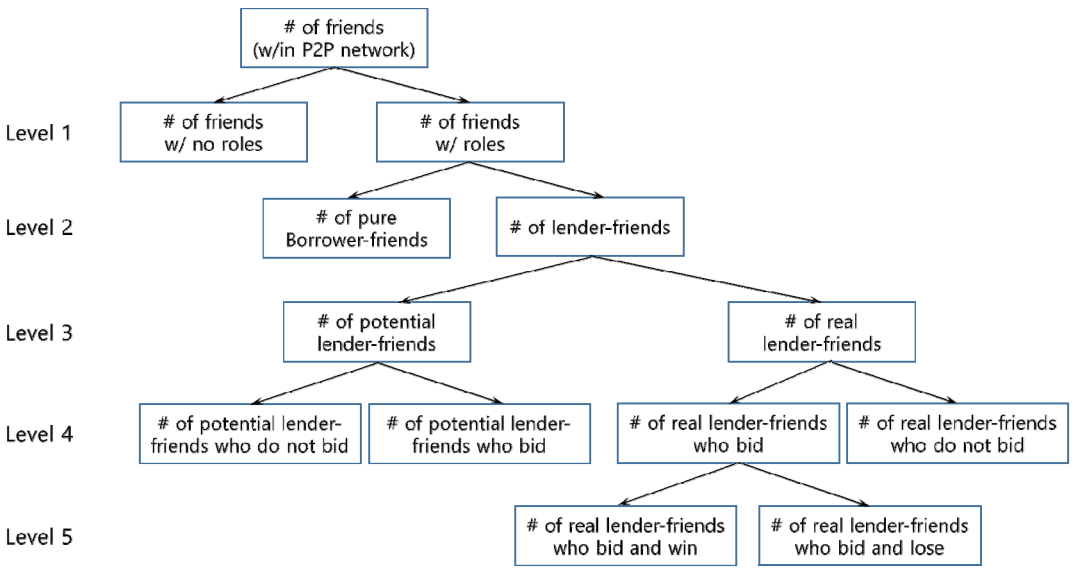
The main outcome documented empirically in the literature is that including soft data improves the model fit by reducing the omitted variable bias and does enhance the accuracy of the incidence model. There are several specific types of soft data whose effects are documented in the literature. First, social or friend network matters in fitting the incidence model. In particular, Freedman and Jin (2017) demonstrates that the value of friends of loan applicant is a statistically significant predictor for probability of default, and that this signal is more pronounced in lower credit grades; Everett (2010) finds that loans funded by the investors in a peer network who are personally connected to borrowers tend to perform better. Likewise, Lin et al. (2013) finds that the credit quality of a borrower's friends is related to the higher probabilities of funding, lower interest rates, and lower default rates. The study also shows an empirical implementation of defining friend types in a hierachical fashion (as shown in Figure 4).[10]

Second, a series of "digital footprint" variables is also shown to be a part of soft data.[11] For example,Berg et al. (2020) uses various variables of this category: (1) the operating system of mobile phone (iOS or Android), (2) the channel through which a customer comes to an

[9] See Gorton and Winton (2003) for a review.

[10] At the top level in Figure 5 are friends who play a least role in a peer network and for whom loan applicant can register only simple identifier such as email address; As the friendship hierarchy goes up (from Level 1 to Level 5 as shown in Figure 8), they play a more significant role as general investors or as those who are actually willing to fund loan application in question, and loan applicants can identify more detailed (and personal) information on those friends such as social security number, bank accounts, and driver's license, and so on.

[11] Our dataset contains a set of ten digital footprint variables: the device type (for example, tablet or mobile), the operating system (for example, iOS or Android), the channel through which a customer comes to the website (for example, search engine or price comparison site), a do not track dummy equal to one if a customer uses settings that do not allow tracking device, operating system and channel information, the time of day of the purchase (for example, morning, afternoon, evening, or night), the email service provider (for example, gmail or yahoo), two pieces of information about the email address chosen by the user (includes first and/or last name and includes a number), a lower case dummy if a user consistently uses lower case when writing, and a dummy for a typing error when entering the email address.



Source: Lin et al. (2013) (Re-produced based on Figure 1, p. 19)

Figure 4. Friends Hierarchy (revised and recreated from Lin et al. (2013))

e-commerce company's website, (3) email service provider, (4) existence of first and/or last name in email address, (5) typing error. Through a regression analysis, the study reports that the probability of credit incidence is lower if customers use iOS (Apple) (instead of Android), with the difference in default rates between customers using iOS (Apple) and Android being equivalent to the difference in default rates between a median credit score and the 80th percentile of the credit score; if customers come from a price comparison website (i.e., an indicator of non-compulsive purchaser); and, if they use their name in e-mail address. A number of studies recently documents a gain in accuracy for credit risk assessment with the use of different types of soft data (e.g., Freedman and Jin 2018, Puri et al. 2017, Berg et al. 2017, Hildebrand et al. 2017, Herzberg et al. 2016, Iyer et al. 2016).

Third, location of loan applicant (e.g., a high-crime area, an area where factories are being shut down or relocated) is shown to be determinant of the incidence (Buchak et al. 2017, Havrylchyk et al. 2018, Chen et al. 2017, Alyakoob et al. 2017, Jagtiani and Lemieux 2018). Previous studies have found evidence that local economic information could serve as a relevant source of nontraditional information by FinTech lenders; and some fintech lenders can identify whether the loan applications are submitted from a high-crime area or in an area where factories are being shut down or relocated (Crowe and Ramcharan 2013; Bertsch et al. 2016; Buchak et al. 2017; Havrylchyk et al. 2018; Chen et al. 2017; Alyakoob et al. 2017; Jagtiani and Lemieux 2018).

Fourth, trustworthiness assessed by photo and other information (e.g., an index in that vein) is sometimes used as a part of soft data. (Duarte et al. 2012; Ravina 2008; Pope and Sydnor 2011; Duarte, Siegel, Gonzalez and Loureiro 2012; Young 2012). Duarte et al. finds that borrowers who appear more trustworthy have higher probabilities of having their loans funded, and they indeed have better credit scores and default less often. This finding suggests that appearance-based impressions affect individuals' decisions not only in labor markets and politics (e.g., Hamermesh and Biddle 1994; Todorov et al. 2005) but also in financial transactions. However, the results imply that the platform lending can be biased toward seemingly attractive or trustworthy faces but away from those lacking such attributes, which potentially carries a risk of disparate treatment and fair lending violation. A central issue to the value of this line of research is that, once borrowers understand that lenders are using such information, they could choose to alter the way they submit text or photo information.

C. Extended Financial Inclusion

Do FinTech lenders make the financial service sector more complete by serving "the underserved"?[12] The recent studies indicate that the answer is generally yes, in that this new breed of service providers tends to extend financial inclusion by serving those borrower segments or geographical areas that are left out by existing financial institutions. As empirical evidence, the P2P lenders in the U.S. are shown to be bottom-fishing borrowers with low credit scores, e.g., those with FICO scores less than 640 who are generally rated as a non-prime segment, as well as those with thin or no filers, i.e., those consumers who have either no or insufficient credit history. Reflecting this, the average approval rates by the platforms are generally low (as shown in Table 3, 13.6 percent in the U.S., representing the case of Lending Club, and 10~25 percent in U.K.) and the average lending rates are high (14.2 percent in the U.S. and 10.86 percent in U.K.).

There is one particular consumer segment whose welfare appears to be clearly improved by the FinTech lenders, i.e., those with no or scanty credit history ("thin filers"), for whom the FinTech lenders show a potential to fill this gap and to expand financial inclusion for them (Berg et al. 2018). As another empirical evidence, using account-level data from a major P2P lender in the U.S., Jagtiania and Lemieux (2018) reports that, ceteris paribus, the platform's consumer lending activities penetrate those areas that may be underserved by traditional banks, such as in highly concentrated markets and areas that have fewer bank branches per capita, as well as those areas where the local economy is not performing well. Also documented is that as the number of banks and banking offices continue to decline, the presence of FinTech lenders tends to supplement the availability of unsecured consumer credit (Jagtiani and Lemieux 2018, De Roure et al. 2018), Buchak et al. 2017).

In a dynamic sense, however, whether FinTech lenders deliver a similar welfare gain on a longer-term basis is less clear. As empirical evidence to that end, using a large credit bureau dataset including about one million borrowers who used an MPL platform, Chava and Paradkar (2018) shows that the borrowers use the funds from the platforms mainly to consolidate their credit card debts, due to which the card balances decline by 47% on the average right after the funding relative to the previous quarter and their credit card utilization ratios also decrease accordingly. As a result, the credit scores for the MPL borrowers improved, a 19 point increase on the average, in the quarter right after loan origination, and the transition probability of subprime (near-prime) borrowers to the near-prime (prime) category rises by 35% (33%) compared to non-MPL borrowers in the same location (ZIP+4 geographical area). However, the study also reports that the MPL-borrowers tend to receive additional credit from their existing bank relationships, resulting in a higher aggregate indebtedness three quarters after the funding and a significant increase in credit card defaults sub-

Table 3. Comparison of P2P lending sector across the selected countries

		US[1]	UK[2]	China[3]	Korea[3]
Lending	Approval rate	13.6%	10~25%	na	5~10%
	Maturity	3.5(yrs)	1~5	9.3 months	6 m~3 yrs
	Average lending rate	14.21% (6.9~29.3%)	10.86% (3.2~34.9%)	10.45% (na)	12.4% (4.4~19.9%)
Investment	Average yield[4]	5.54% (-0.7%~10.8%)	6.67% (2.9~6.1%)	na	10%

1.Based on the lending Club rates (those loans issued in 2016); 2.Based on the Zopa lending rates (& the average yield); 3.Representing industry averages collected from various sources (for China and Korea); 4.Before tax yield after subtracting fees. (Sources: Lee (2017), p.38)

[12] The size of the credit-constrained consumers is quite substantial even in the developed economies: as an illustration, Bricker et al. (2017) reports that, based on the 2016 Survey of Consumer Finance, 20.8 percent of families feel credit-constrained; and, Carroll and Rehmani (2017) estimates that as many as 60 million people in the U.S. may have been unable to access credit because of their thin credit files or lack of credit history.

sequently (with the subprime MPL borrowers up to 1.5 times more likely to default than their non-MPL counterparts). DiMaggio and Yao (2018) report a similar result in that, while the FinTech borrowers' credit outcomes improve right after receiving funds, they are significantly more likely to be delinquent and exhibit higher indebtedness after several months. They also report that the FinTech borrowers are more likely to be present-time biased and tend to carry a significant credit card balance.

From the perspective of the developing countries, a large segment of financial consumers tends to be excluded from formal financial services, and the FinTech service sector is playing an important role in filling the gap through mobile platforms. In fact, a number of studies document that the mobile payment systems are serving as a powerful mechanism of financial inclusion by leap-frogging the development of the conventional financial service mediums (e.g., checking and savings accounts, insurance contracts, investments, and credit cards) (Aker and Mbiti 2010, Mbiti and Weil 2011, Jack and Suri 2014, CitiGroup 2018, Gathoto 2018). Good examples are the mobile payment systems that are widely used in China (AliPay and TenPay) and in African countries (M-Pesa, MTN MobileMoney, and OrangeMoney).

D. Increased Cyber-Crimes

The more connected the financial service sector through the online platforms is, the higher the chance of illegal financial transactions becomes, as documented in the literature. As a case in point, IMF (2016) reports that the number of exposed identities has been rising steeply by jumping 23 percent in 2015 with the total 429 million cases, resulting in global damages estimated to be more than $500 billion per year. In the FinTech service sector, the number of cases for a pseudo (or fraudulent) intermediation by illegal transaction counterparties is also increasing, such as stealing private data through hacking, threatening financial consumers through "voice phishing" (fishing private information for the purpose of demanding money transfer through mobile phone or other means), and spreading a ponzi scheme to recruit investors for a fake investment product (e.g., fake private equity funds, stock listings, derivative contracts, and cryptocurrency trades). In this vein, the "darknets"[13] in which transactions are enabled by the cryptocurrencies are known for various illegal trades (e.g., drugs, hacks and thefts, illegal pornography, and, even, murder-for-hire) in an anonymous and efficient fashion, whose economic value is estimated to be around $76 billion in 2017 (Foley et al. 2019).

As one incident to note as to the consumer protection problem in the online CRA sector, there were a large number of P2P platforms (over 3,000 out of about 5,000) that were either closed or ceased operations between 2014 and 2017 when the regulatory authority in the country strengthened the supervision on the sector (Citi GPS (2018). Such cases indicates that the sector should be properly supervised, not only in terms of financial safety and soundness of their online operations (via a regime of risk-based capital requirements and other regulatory measures to contain the liquidity and operational risks), but also protecting financial consumers with a set of effective measures in both demand-side and supply-side of the CRA service sector.

One particular issue to be discussed in this vein is MyData,[14] a new data consultancy service based on consumers' own private data. This service area appears to be potentially promising in that it clearly assigns the property right on private (or personal) financial data to financial consumers and, at the same time, allows the use of personal data in a welfare-enhancing fashion. For example, in Korea where MyData was introduced in early 2020, the service encompasses a fairly broad scope of operations for the service providers (e.g., credit evaluation, training, lending, among others, in addition to the consultation). Furthermore, it is also designed to cover not only financial data but also other consumer data (for medical service, education, and government services of certain types). Though it remains to be seen whether this new service area actually enhances consumer welfare-enhancing in any meaningful fashion, it can serve as a stimulator to utilize private data to innovate financial services for consumers.

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[13] The study estimates that there are about 30,000 darknet domains in operation, with the famous case of "Silk Road," in which a very elaborate drug transaction system via Bitcoin and other cryptocurrency-based escrow accounts is established (descriptions of many different types of drug, insurance and refund policies, and postage methods and locations of delivery).

[14] As a new financial service business, MyData generally refers to a consultation service provided by a third party on personal financial planning with consent by financial consumers on use of his or her private financial data.

Ⅴ. FinTech and Financial Consumer Protection

What implications can we draw from the above discussions on the workings of the online CRA service providers as to the financial consumer protection (FCP)? The key policy objective for FCP, as the recent literature argues, boils down to ensuring two behavioral principles in the financial markets - informed and sound (i.e., financially-savvy) decisions by consumers in choosing financial products and services and, at the same time, fair and ethical treatment of the consumers by financial institutions (FIs) and their employees despite the fact that their primary incentive is in maximizing profit.[15] As such, the FCP policy instruments should target to tame specific behavioral patterns that are frequently observed from the financial markets, such as:

- Pro-cyclical lending, or excessive pursuance of short-term profits by financial institutions and their employees at long-term costs;
- Credit rationing caused by "Type-A" information asymmetry, i.e., the service providers' being disadvantaged as to financial consumers' creditworthiness, and excess demand created in the lending sector;
- Misrepresentation or incomplete sale caused by "Type-B" information asymmetry, i.e., financial consumers being disadvantaged in understanding arcane financial products;
- Pseudo or fraudulent intermediations by illegal service providers, e.g., theft of private data, voice phishing, and a ponzi investment scheme;
- Overleverage by liquidity-constrained financial consumers (as borrowers in the lending sector);
- Herd behavior or uninformed investment by liquidity-surplus financial consumers (as investors in the lending sector); and,
- Myopic and uninformed decisions by consumers caused by a lack of fundamental knowledge and information on financial products and services.

As to the specific FCP measures on the demand-side, the traditional education programs are generally viewed as having a limited effectiveness at least for adults (those for school-age children on basic financial concepts may be more useful). In the literature, it is emphasized that a timely provision of information to financial consumers (via training, counseling, and product summary) such that they can make more sound and informed decisions should be the way in designing education or counseling programs (Mandell 2006, Lynch et al. 2013, Lusardi and Mitchell 2015, Cude 2020). In addition, providing product information to financial consumers in an understandable fashion is also stressed as an underlying principle, for which various experiments on consumer behavior to explore the best practice is also warranted.[16] In terms of the empirical methodology, the randomized controlled trial (RCT), which is being popularized as a sound research design in different academic disciplines, appears to be a promising way to test if the demand-side FCP measures in fact influence consumer behavior and wellbeing.[17]

On the supply-side, various FCP measures have been instituted since the 2008 financial crisis, which can be categorized into two groups: that is, those ex ante (i.e., before point-of-sale) measures of voluntary or regulatory requirements, including information provision, code of business conduct, training on business ethics, and so on; and, those ex-post measures for conflict resolution (before a lawsuit), ombudsman, and FCP-related KPIs used in performance evaluation. While it is generally the case that the conventional service providers (e.g., banks, insurance companies, security dealers) tend to employ these measures during the last decade or so, the FinTech service sector tends to lag in instituting similar measures. In a sense, those FCP measures are more warranted for this online platform-based service providers given its vulnerability to cyber-crimes, which should be the task for financial supervisors in coming years.

Ⅵ. Concluding Remarks

This study attempts to document the main implications of the online CRA sector on financial consumers, examin-

[15] See Cho and Part (2021) for a literature survey along with the institutional arrangements of the demand- and supply-side FCP measures.

[16] See Knoll (2021) as an example.

[17] See Kaiser et al. (2020) for the meta-analyses on those studies that utilize the RCT method for testing the effects of financial education.

ing specific areas of welfare gain or loss for consumers - enhanced intermediation efficiency, reduced information asymmetry, expanded financial inclusion, and increased risk of cyber-crimes. Overall, the sector is greatly changing the ways to deliver financial services by utilizing digital technologies and data, making it possible to combine financial and non-financial transactions as a one-stop shopping for financial consumers. In addition, through a more accurate measurement of credit risk, the sector also extends financial inclusion for those marginal consumer segments who are excluded from the conventional financial service sectors. As a wrap-up, three points are elaborated below to suggest the role to be played by the global research community in making the sector even more welfare- enhancing going forward.

First, there should be a heightened level of empirical investigation on whether those FCP measures discussed actually have an impact on behavioral outcomes and, further, on types of nudges to induce such behavioral changes. Financial education represents one particular area that will benefit from such research endeavor in future. Nonetheless, some of the supply-side FCP policy elements should also be the topics of similar empirical investigation. For example, effects of different training programs for business ethics, specific rules and regulations to reflect the usual principles of business conduct, and alternative dispute resolution mechanisms can be the targets of such empirical endeavor. In addition, the inter-play between the FCP measures and other public policy goals (e.g., the safety and soundness regulations) should also be a topic of future theoretical and empirical research.

Second, the human dimension of the FCP policy regime should also be investigated. That is, even if a country has the best possible FCP institutions in both demand- and supply-side, they will not be effective and will not deliver intended outcomes unless a group of professional, capable, and committed personnel carries out those tasks. Hence, there should be a conscientious effort and strategy to develop and place such people in key positions, whether they are educators, counselors, or regulators. In the end, it is more likely to be those who run it rather than the system itself that can make the system fail and cause a large-scale systemic problem. Hence, the statement, "it is singer not the song," should also apply to designing a FCP policy regime. In that sense, it is important to deploy those who are technically capable of carrying out the FCP policy measures in the era of digital transformation, with skills in AI-based analytics and the non-conventional data that are increasingly important.

Finally, there should be a long-term and international research collaboration on the various topics that warrant sound and careful research in the future. Given the diverse topics for future research in this space, the nature of the research should also be interdisciplinary among financial economists, legal scholars, education experts, and others in related fields. In addition, lessons learnt by one country, whether they are positive or not, can be useful to other countries, which represents another argument for the international research collaboration. To that end, it is also important to work with those existing organizations, e.g., the international academic and policy-coordination bodies such as IAFICO (the International Academy of Financial Consumers), CI (the Consumer International), FinCoNet, among others, which can serve as sustainable forums to share research findings and policy practices among interested scholars.

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Editorial Principles

1. Mission

The International Review of Financial Consumers (IRFC) aims to offer a communication platform for scholars, regulators, and practitioners to share their latest academic research on financial consumers and related public policy issues in both advanced economies and emerging market countries. All theoretical, empirical, and policy papers of relevancy are welcome, with the following as the topics to cover:

① protection for financial consumers
② business ethics of financial institutions
③ market discipline of financial industries
④ corporate social responsibility of financial institutions
⑤ renovation or innovation of law and regulations related to financial consumption
⑥ public policies for financial consumption
⑦ fair trading of financial products
⑧ dispute resolution for financial consumption
⑨ case studies of best practices for financial consumption
⑩ international comparison on any of the above topics

2. Publication schedule and contents

IRFC, the affiliated journal of the International Academy of Financial Consumers (IAFICO), will be published twice a year - April and October each year - and will pursue to be the first international academic journal focusing on the research related to financial consumers. As the contribution of financial consumption becomes increasingly important to the national economy for most countries, how to maintain an efficient and equitable financial market is an imminent issue for research. The trend of globalization and liberalization policies has reinforced the challenges in financial markets. Not only the financial instruments become more complicated and hard to understand by the public, but also the frequent changes in regulations and business practices cause confusions to the financial consumers. Consumption disputes regarding the financial products have drawn attention by the media in recent years. IRFC attempts to serve as a forum to publish and share original and innovative research, both academic and policy-oriented, on all the above issues.

3. On ethics for research

The range of research misconducts

① Misconducts related to academic research (“misconducts” hereafter) means that fabrication, falsification, plagiarism, unfair showing of papers' author, during research proposal, research performing, research report and research presentation,

etc. It is as follows.

1) “Fabrication” is the intentional misrepresentation of research results by making up data or research result.

2) “Falsification” is the distortion of research contents or results by manipulating research materials, equipment and processes, or changing or omitting data or results.

3) “Plagiarism” is the appropriation of another person's ideas, processes or results, without giving appropriate approval or quotation.

4) “Self-plagiarism” is the reusing a large portion of their own previously written research.

5) “Unfair showing of papers' author” is not qualifying people, who have been contributing to research contents or results scientifically, industrially and politically, as an author without just reason, or qualifying people, who have not been contributing the same, as an author with an expression of thanks or respectful treatment.

6) Obstructing investigation about misconducts of their own or others, or harming an informant.

7) Action which is out range of usually acceptable in the course of the research.

8) Action which is suggestion, pressure or threat to others to do the above things.

4. On plagiarism

Types of plagiarism

Following two forms are defined the representative action of research misconducts (Plagiarism).

① Using the original author's idea, logic, unique terms, data, system of analysis without indicate the source.

② Indicating the source but copying the original paper's words, idea, data and so on without quotation marks.

Author Guidelines

General

The IRFC publishes rigorous and original research related to protection of financial consumers. IRFCs shall be published twice a year, in April and in October. Papers submissions shall be accepted throughout the year. Editorial Board will evaluate manuscripts in terms of research contribution to the field and paper's quality. Research area includes but is not limited to the following topics:

1. Protection for financial consumers
2. Business ethics of financial institutions
3. Market discipline of financial industries
4. Corporate social responsibility of financial institutions
5. Renovation or innovation of law and regulations related to financial consumption
6. Public policies for financial consumption
7. Innovation or fair trading of financial products
8. Dispute resolution for financial consumption
9. Case studies of best practices for financial services or their consumption
10. International comparison of protection for financial consumers.

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When authors submit their manuscripts to IRFC for publication consideration, they agree to abide by IRFC's publication requirements. In particular, authors confirm that:

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- The manuscript has not previously been submitted to IRFC for review. Submission of manuscripts previously presented at a conference or concurrently considered for presentation at a conference does not disqualify a manuscript from submission to IRFC.
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Preparing a Manuscript for Submission

1. Papers must be submitted in Microsoft Word format. The structure of the work should be as suggested by the Publication Manual of the American Psychological Association 6 edition:
   - Title
   - Author's name and institutional affiliation
   - Author note
   - Abstract
   - Introduction
   - Method
   - Results
   - Discussion
   - References
   - Appendices and supplemental materials.

2. Manuscripts should be written as concisely as possible without sacrificing meaningfulness and clarity. They should be no longer than 40 double-spaced pages with one-inch margins and Times New Roman 12-point font, including references, tables, figures and appendixes.

3. Submitted papers should be in English, with grammar, spelling and punctuation thoroughly checked.

4. Make sure lettering and sizing of your manuscript, as well as bullet points and numerals are uniform.

5. The title page must include the title of the paper and an abstract of no more than 200 words. Indicate not more than seven key words after the abstract.

6. Please provide author name(s) contact information in a separate page.

7. Sections, including introduction, should be numbered in Roman numerals. Subsection headings should be in letters, e.g. A, B, C.

8. Tables must be typewritten, not in the form of pictures, and given Arabic numerals. They should have a descriptive name following the table number. Tables can be placed either after the text in the paper or in appendix section, if too detailed.

9. Figures must be given Arabic numbers as well and must not include any explanatory materials, which should go to the legend or to the caption. Captions should include a brief description of the figure. Please ensure that figures are of as high quality as possible.

10. The last section of a paper should include main conclusions of the research.

11. References should be placed at the end of the paper. All references must be in the style of American Psychological Association 6th edition, the basics can be found here. Make sure all in-text citations are presented in the reference list. The examples of reference entries are as follows:

For monographs:

Henderson, J. (2012). *Health economics and policy* (5th ed.). Mason, OH: South-Western, Cengage Learning.

For contributions to collective works:

Leonidou, L. (Eds.). (2018). Advances in global marketing: A research anthology.

For periodicals:

Nam, S. (2006). A study on the causality between the insurance and economic growth, *Korea Insurance Journal* 74, 169-197.

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With any issues regarding the publication of your paper, please email the IRFC Editor, Professor Sharon Tennyson, at irfc@cornell.edu.

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- Normal review process
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Bylaws of the International Academy of Financial Consumers (IAFICO)

March 31, 2015
First revision on April 19, 2016
Second revision on September 30, 2019

Section 1 General Provisions

Article 1 (Official Name)

The official name of this academic society shall be the “International Academy of Financial Consumers (IAFICO hereafter)”.

Article 2 (Registered office and Branch offices)

The registered office is to be in Seoul, South Korea. Branch offices may be established in provincial cities in Korea or overseas should the need arise.

Section 2 Objectives and Undertakings

Article 3 (Objectives)

*Pending
The IAFICO is a non-profit association aiming at promoting and developing at an international level collaboration among its members for the study of various issues relating to financial consumers, including its education, legislation, creation of best practices, supervision, and policy advancement to contribute to the development of the global economy and financial market, through investigation or research into financial consumers, and other academic activities.

Article 4 (Undertakings)

The following activities shall be carried out in order to achieve the objectives of the IAFICO.
1. Publication of journal and other literature
2. Hosting of academic conferences
3. Additional undertakings corresponding to the objectives of the academic society which are deemed necessary at the board of directors meeting or the general meeting

Section 3 Membership

Article 5 (Requirements and Categories)

The IAFICO shall have following categories of membership:

① Individual member

Individual members are categorized further into a regular member or an associate member.

1. Regular member shall be a specialist in the area such as finance, consumer studies, economics, management, law, or education etc, and must be a full-time instructor at a domestic or overseas university, a researcher at a research institute with equivalent experience, or should hold equal credentials to those mentioned previously, and shall become its member by the approval of the board of directors. Regular members attend general meetings and may participate in discussions, hold the right to vote, and are eligible to be elected to a director or other status of the IAFICO.
2. Associate members shall be divided into either a student member, who is a current domestic or overseas graduate school student, or an ordinary member, who works for a financial institution or a related organization. Associate members do not hold the right to vote and are not eligible to be elected to a director or other status of IAFICO.
3. Both regular member and associate member must pay the membership fee to the IAFICO every year.
4. In the case that a decision is made by the Board of Directors to expel a member due to a violation of the objective of the society, or demeaning the society, or in the case that a member fails to pay the membership fees for two years continuously without prior notice, their membership shall be revoked.

② Institutional member

1. Institutional member shall be organizations related to financial consumers who do not damage the impartiality of the IAFICO subject to approval of the Board of Directors. Institutional members do not hold the right to vote and are not eligible for election.
2. Institutional member must pay its membership fee to the IAFICO every year.

Section 4 Organization

Article 6 (Designation of Board of Director)

The following Directors are designated to constitute the Board of Directors to run the IAFICO.

1. Chairperson
2. Vice-Chairperson
3. President
4. Vice-President
5. ordinary Directors
6. Auditor

Article 7 (Election of Board Members and Director)

① The Chairperson, Directors, and Auditors shall be elected or dismissed at the general meeting.
② Appointment of the Directors may be entrusted to the Chairperson pursuant to the resolution of the general meeting.
③ The Vice-Chairperson, President, and Vice-President shall be appointed and dismissed by the Board of Directors.

Article 8 (General Meetings)

① General meeting shall decide following matters relating to the activities of the IAFICO.
1. Amendments to the Bylaws
2. Approval of the budget and settlement of accounts
3. Election or Dismissal of the Chairman
4. Election or dismissal of Auditors
5. Regulations concerning the duty and rights of members
6. Resolutions regarding items submitted by the President or Board of Directors
7. Other important matters

② The Chairperson must call a regular general meeting at least once a year and report on the undertakings of the IAFICO. Provisional general meetings may also be held by the call of the Chairperson, or at the request of at least a quarter of current regular members, or according to the resolution of the Board of Directors.
③ At a general meeting, a quorum is formed by one third of regular members. However, regular members who are not able to participate in the general meeting in person may be represented by proxy, by entrusting a specific regular member attending the general meeting with their attendance or voting right. In this case the letter of proxy is included in the number of attendees.
④ Resolutions at the general meeting will be made according to the majority vote of the attending members who hold the right to vote.
⑤ In principle, the general meeting shall be held with face-to-face meeting, however, it may be held web-based meeting when needed.

Article 9 (Auditors)

① The auditors shall audit financial affairs, accounts and other transactions of IAFICO, shall participate in, and may speak at board meeting, and must present an auditor's report at the regular general meeting.
② There shall be two appointed auditors.
③ Auditors are elected at the general meeting.
④ An auditor shall serve a term of two years and may be reappointed.

Article 10 (Board of Directors)

① The Board of directors shall be made up of chairperson and fewer than 80 directors.
② The Board of Directors shall decide a plan of operation and establish the budget, in addition to matters on the running of IAFICO.
③ Board meeting requires a quorum of at least one third of current board members. Resolutions at the Board meeting will be made according to the majority vote of the attending members. However, board members

who are not able to participate in the board meeting in person may be represented by proxy, by entrusting another specific board member attending the board meeting with their attendance or voting right.

④ A board member shall serve a term of two years, with a possibility of serving consecutive terms.

⑤ A number of sub-committees or branches in each country or region may be set up under the Board of Directors to support the running of the IAFICO.

Article 11 (Steering Committee)

① The Board of Directors may entrust some decisions relating to the conducting of business to the Steering Committee.

② The Steering Committee shall be comprised of the Chairperson, Vice-Chairperson, President, and the heads of each subcommittee.

③ Temporary task forces may be established by the Steering Committee when necessary to run the business of the Steering Committee.

Article 12 (Chairperson)

① The Chairperson shall represent the IAFICO and chair its general meeting and board meeting.

② There shall be one appointed Chairperson who serves a term of three years.

③ In the case of an accident involving the Chairperson, the Vice-Chairperson shall complete the remaining term of office of less than one year. If it lasts longer than one year, a new Chairperson shall be elected at the general meeting.

④ A new Chairperson should be elected at the general meeting one year prior to the end of the current Chairperson's term of office.

⑤ Should it be judged that it is difficult for the Chairperson to carry out their duty any longer, he or she may be dismissed from their post by the decision of the Board of Directors and general meeting.

Article 13 (Vice-Chairperson)

① The Vice-Chairperson shall assist the Chairperson, and serve as a member of the Board of Directors.

② The Vice-Chairperson shall serve a term of two years, or the remaining term of office of the Chairperson, whichever is shortest.

③ The Vice-Chairperson shall be elected from one of the regular members at a meeting of the Board of Directors, according to the recommendation of the Chairperson.

④ The Vice-Chairperson may be reappointed.

Article 14 (President)

① During its term of office, the President shall become the head of the organizing committee supervising international conferences, and serves for a term of one year. The President shall attend the board meeting as a member of the Board of Directors.

② The succeeding President shall be elected by the Board of Directors after considering their ability to organize and host the following year's conferences. The succeeding President shall also attend board meeting as a member

of the Board of Directors.

③ The Board of Directors may elect the next succeeding President should the need arise. The next succeeding President shall also attend board meeting as a member of the Board of Directors.

④ The President, succeeding President, and the following President may appoint a Vice- President respectively by obtaining approval of the Board of Directors.

⑤ The appointment and dismissal of the President is decided at the board meeting.

Article 15 (Vice-President)

① A Vice-President is a member of the Board of Directors and shall assist the President, supervise applicable international conferences.

② A Vice-President is recommended by the President and shall be approved by the Board of Directors.

③ Multiple Vice-Presidents may be appointed.

④ A vice-President shall serve a term of one year, the same as the term of President.

⑤ In the event of an accident involving the President, a Vice-President shall fulfil the President's duties during the remaining term of office.

Article 16 (Editorial Board)

① The Editorial Board shall be responsible for editing of journals and other materials to be published by the IAFICO.

② The head of the Editorial Board shall be appointed by the Board of Directors, and shall serve a term of office decided by the Board of Directors.

③ The head of the Editorial Board shall be a member of the Board of Directors.

④ Additional matters concerning the running of the editorial board shall be decided separately by the Board of Directors.

Article 17 (Advisory Board and Consultants)

① The Chairperson may select individuals who could make a large contribution to the development of the IAFICO, and appoint them as advisors subject to the approval of the Board of Directors.

② The Chairperson may appoint consultants subject to the approval of the Board of Directors in order to receive advice relating to all business matters of the IAFICO, such as development strategies, conferences, research plans, and research projects etc.

③ Advisors and consultants shall serve terms of one year and may be reappointed.

Section 5 Financial Affairs

Article 18 (Accounting and Revenue)

① The fiscal year of the IAFICO shall run from the 1st of January to the 31st of December each year.

② The finance required to operate the IAFICO shall be sourced from membership fees, member contributions, society participation fees, and other incomes. Related matters shall be decided by the Board of Directors or the Steering Committee.
③ Should the need arise, the IAFICO may accept sponsored research, donations or financial support from external parties in order to support the business performance of the IAFICO. The Chairperson shall report the details of these at the board meeting.
④ Chairperson should report all the donation from outside and their usage of the year at the IAFICO homepage by the end of March of the next accounting year.

Section 6 Supplementary Rules

Article 19 (Revision of the Bylaws)

① Any other matters not stipulated by this Bylaws shall be resolved by the Board of Directors.
② Revision of the Bylaws shall be carried out, by the proposition of the Board of Directors, or at least one-tenth of regular members, at a general meeting where at least one-third of the total regular members are in attendance, or at a provisional general meeting, with the agreement of at least two-thirds of current members.

Article 20 (Dissolution)

Should the IAFICO intend to be dissolved, it must be decided upon at a general meeting with the agreement of at least two-thirds of current members, and permission must also be received from the Fair Trade Commission. Except for bankruptcy, the dissolution must be registered and reported to the Ministry of Strategy and Finance within three weeks, accompanied by a certified copy of register.

Article 21 (Residual Property upon Dissolution)

Should the IAFC be dissolved, according to article 77 of the Korean civil law, all remaining assets of IAFICO shall belong to the state, local government, or other non-profit corporations carrying similar objectives.

Additional Clause

These Bylaws shall become effective from the 1st April 2015

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Editor-in-Chief	Sharon Tennyson
Publishing Institute	The International Academy of Financial Consumers
	32516 Dasan Hall of Economics, SKKU, 25-2, Sungkyunkwan-ro, Jongno-gu, Seoul, Korea
	Tel : +82 2 760 1283
	Fax : +82 2 766 0527
	E-mail : iafico@kdis.ac.kr