



Research Article

© 2024 Chul Choi.
This is an open access article licensed under the Creative Commons
Attribution-NonCommercial 4.0 International License
(<https://creativecommons.org/licenses/by-nc/4.0/>)

Received: 4 October 2023 / Accepted: 19 December 2023 / Published: 5 January 2024

The Microstructure of Mis-Selling: Financial Investment Markets and Regulation in Korea

Chul Choi

Associate Professor, Consumer Economics,
Sookmyung Women's University,
Seoul, Korea

DOI: <https://doi.org/10.36941/ajis-2024-0001>

Abstract

Financial consumer protection has been ever strengthened around the world after the Global Financial Crisis. Nonetheless, there occurred mis-selling events that caused massive damage to financial consumers and mis-selling still accounts for the largest proportion of financial consumer disputes and complaints recently filed in Korea. Based on the regulatory framework in Korea, this study aims to explore the microstructure of mis-selling, that is, the major influential factors and their interactions. For this, an analytical model is proposed concerning the suitability principle and explanation duty in financial investment markets. The model consists of three basic components: the types of investors, a financial services company's objective of profit maximization, and the damage compensation structure set by the regulator. Using the model, the simulation results provide meaningful implications. Strict liability turns out to be effective to prevent mis-selling. The suitability principle is more prone to be violated than the explanation duty and therefore more emphasis should be placed on the former in terms of efficient regulation. Furthermore, this study found a meaningful link between business conduct regulation and financial education, which are the two pillars in financial consumer protection.

Keywords: *Mis-selling, suitability principle, explanation duty, financial investment, financial consumer protection*

1. Introduction

Following the Global Financial Crisis of 2007-2008, there began a major wave of strengthening financial consumer protection around the world. In the US, the Dodd-Frank Wall Street Reform and Consumer Protection Act was legislated in 2010 and it created the Consumer Financial Protection Bureau. The UK also restructured financial regulation and launched two split agencies, the Financial Conduct Authority and the Prudential Regulation Authority, by the Financial Services Act 2012. The High-Level Principles on Financial Consumer Protection were endorsed by G20 Leaders in 2011 and adopted by the OECD Council in 2012. In Korea, the Financial Supervisory Service (FSS) combined its consumer protection functions scattered across financial sectors and established the Financial Consumer Protection Bureau as a quasi-independent organization in 2012. The FSS and its bureau have enforced financial laws and made every effort to provide more effective consumer protection. The culmination was, however, the legislation of the Financial Consumer Protection Act (FCPA). Although the first bill was proposed in 2011, the 15th bill was finally passed in 2020 after a long debate.

The act introduced the six major principles of business activities. Among the business conduct rules, the suitability principle and explanation duty are essential for prevention of mis-selling.

The motivation of this study relates to the scandalous mis-selling events that occurred in Korea before the reinforcement of financial consumer protection. The Tong Yang Securities Crisis in 2013 was a typical example. According to the FSS (2015), more than 20,000 investors claimed that Tong Yang Securities fraudulently sold non-performing debt securities issued by its affiliates without informing investors of the risks attached to them. Five of the affiliates ended up filing for court receivership after failing to repay their debts. After thorough investigation for about 9 months, the mediation committee of the financial supervisory authority finally decided that the financial investment services company (FISC) should compensate from 15 to 50 percent of the losses for making an improper investment recommendation or not fully disclosing information about corporate bonds and commercial papers. The resolution proposed by the mediation committee carries no legally binding force. Once accepted by both parties, however, the agreement becomes binding without further opportunity for recourse. In addition, the outcome will play a pivotal role as a precedent in dealing with similar cases later on.

The term “mis-selling”, which is also referred to as incomplete sale in Korea, is frequently used in practice more than ever, as it has become the main source of investors’ complaints and disputes with financial services companies. In 2013, for instance, the total number of petitions filed in financial investment markets increased by about 40 times that in the preceding year, mainly due to the Tong Yang Securities Crisis involving mis-selling (FSS, 2014). In the midst of growing public concern over the spread of mis-selling, its regulation has become an important policy issue. Misconduct, such as mis-selling, not only has the potential to damage investors’ property but also undermines the integrity of financial investment markets. A regulatory framework, once set by the authority, involves the entire financial system, including the markets and participants. Sometimes regulation does not work alone. For an effective regulatory framework, it is necessary to take into account other related factors that might interact closely with the regulation.

This study presents a model based on a simplified system consisting of investors, FISCs, and the regulatory body. To analyze the microstructure of mis-selling and evaluate the effectiveness of various policy measures, it explores an FISC’s incentive to violate the rules under various circumstances given by a set of parameters. An analytical model explaining the associations between the incentive and its influential parameters leads to a better understanding of the circumstances in which mis-selling is likely to happen. Accordingly, the policy implications in this study concern how to control the circumstances of mis-selling.

2. Basic Concepts and Related Literature

2.1 Suitability Principle and Explanation Duty

The suitability principle concerns the appropriateness of a financial investment product for a particular investor. Bolster et al. (1995) refers to suitability as the appropriateness of financial investments made on behalf of an investor. The suitability principle is simply an obligation to prevent an inappropriate recommendation of a financial product. According to the FCPA, an FISC must confirm whether the investor is an ordinary investor or a professional investor. Furthermore, an FISC must not recommend that an ordinary investor buy a financial investment product if it is deemed unsuitable for the investor based on an investment profile (i.e., investment purpose, status of property, investment experience, and other relevant factors). This regulation is mostly the same as those accepted in US and European financial investment markets.

Financial investment products are characterized by two dimensions, risk and complexity. Furthermore, the suitability principle can be justified by these characteristics because they are closely related to an investor’s investment profile. For instance, the risk dimension corresponds to an investor’s willingness and ability to assume risks, while the complexity dimension corresponds to an

investor's level of sophistication. An investor's financial capability is closely related to the latter dimension. Based on this idea, Koh et al. (2015) propose a rating framework for a financial investment product to assess its suitability. The implication of such a framework is simple: the riskier a financial investment product is, the less suitable it is for an investor whose risk tolerance and risk capacity are limited. Similarly, the more complex a financial investment product is, the less suitable it is for an unsophisticated investor. Although the characteristics of a financial investment product concern suitability, they are also related to the explanation duty.

The explanation duty concerns the sufficient provision of information about financial investment products so that an investor can make an informed choice. As well as the suitability principle, this rule is a fundamental basis for financial consumer (i.e., investor) protection in financial investment markets. The explanation duty is a regulation to assure an informed choice. According to the FCPA, an FISC must not recommend that an ordinary investor buy a financial investment product without explaining its risks and other details that the investor needs to know. This rule is more important to investors who have limited knowledge and experience of financial investments. Direr and Visser (2013) point out that, in fact, the majority of investors depend on financial experts' advice as their main source of information. In the literature, information asymmetry is accepted as the most common rationale for financial consumer protection. According to Stace (2015), disclosure of all material information about an investment is the primary rule worldwide but it has its limitations. This is because the disclosure obligation is based on the assumption that investors are rational and intelligent, although this does not always hold. However, for the explanation duty, an investor's irrationality and low level of financial literacy should be taken into account. In this regard, the explanation duty is more than the disclosure obligation.

As defined above, the suitability principle and explanation duty are distinct from each other. The relationship between the two, which is one of the research issues in this study, is an important matter for the purpose of regulation. Presumably, both rules should be observed with an equal weight because they complement each other. Otherwise, one rule might have priority over the other. In the latter case, the regulator can concentrate more on the prior rule with respect to regulatory efficiency. Regardless of such a possible hierarchy, the suitability principle precedes the explanation duty in a normal process. On the other hand, the relationship between the two rules depends on the characteristics of a financial investment product. This is because the risk and complexity of a financial investment product not only affect suitability but also increase the necessity for sufficient explanation about the product details. Thus, for an unsophisticated investor, the importance of the suitability principle must be considered. The empirical results of Chang et al. (2015) support the importance of the suitability principle for investors with lower levels of financial literacy, showing that the suitability check effect is more pronounced for less financially literate investors.

2.2 What is Mis-selling?

Although the term "mis-selling" is most highlighted and commonly used in practice, its definition is not provided explicitly in the related laws. The lack of a legal definition keeps its meaning ambiguous. For the purpose of this study, however, mis-selling is best understood as the sale involving a breach of business conduct rules required for the process of selling a financial investment product to an investor. In most cases, mis-selling is associated with unsuitable recommendations and insufficient explanations, which constitute a violation of the suitability principle and a violation of the explanation duty, respectively. In addition, mis-selling is referred to as an inappropriate sale or incomplete sale, especially in Korea. Such inappropriateness or incompleteness can be considered to be from failing to comply with the rules. Examining the regulatory framework for the UK financial services industry, Gray (2004) maintains that financial products should be appropriately sold and also advised on to individuals in compliance with both regulatory and private legal standards.

Owing to the variety and complexity of financial products, the requirements for mis-selling might differ by product type. However, the suitability principle and explanation duty are the two

basic pillars of determining mis-selling. Exploring the nature of mis-selling in the financial services industry, Leece (2000) classifies the complex phenomenon into two dimensions: aggregate mis-selling and personal mis-selling. The first is related to the communication of inappropriate expectations of returns, while the second is related to the mismatch between the characteristics of a financial investment product and personal characteristics. Simply, they correspond to the explanation duty and suitability principle, respectively. Inderst and Ottaviani (2009) analyze the conflict between a marketing agent's incentives to prospect for new customers and to provide adequate advice, in which mis-selling is regarded as selling a financial product that might not match a customer's needs. Such a view reflects both the suitability principle and the explanation duty. Estimating life insurance customers' losses caused by mis-selling, Halan et al. (2014) argue that the main reasons for abandoning long-term insurance policies are unsuitability and lack of explanation about how long the policies should be regularly funded for the full benefits.

There are several reasons for mis-selling. Inderst and Ottaviani (2009) argue that a firm with a higher marginal cost of compliance becomes more permissive toward potential mis-selling. Chang et al. (2015) show that the suitability principle tends to be ignored more often when the market interest rate is high or the competition for selling is intense. In this study, mis-selling is defined as a sale involving a breach of the suitability principle or explanation duty. Such a breach is motivated by profit maximization. That is, an FISC misleads investors concerning the characteristics of a financial investment product in an effort to make them buy it. This study uses a theoretical model to explain the decision making of an FISC. However, the main focus lies in examining the influential factors of the effectiveness of the suitability principle and explanation duty, which are a set of unifying rules governing an FISC's relationships with investors. Although this study focuses on an FISC's discharge of recommendation and advice in relation to financial investment products, the implications are also applicable to other financial markets.

3. Model

3.1 Investor Type

It is assumed that an FISC has N potential investors and sells a particular financial investment product. The product might be suitable or unsuitable for an investor. Thus, with respect to suitability, investors are classified as suitable or unsuitable. On the other hand, investors might or might not have enough knowledge and experience of financial investments to choose the most appropriate product for their financial goals and needs. Thus, with respect to information status, investors are classified as informed or uninformed. Furthermore, it is assumed that an informed investor's choice is not affected by whether or not the FISC leaves out certain material information about the product. This is an informed investor's advantage.

Consider two random variables X_i and Y_i , which represent investor i 's suitability and information status, respectively. The type of investor follows a joint distribution, as shown in Table 1. Investors have one of four different types according to their suitability and information status. Although the exact distribution function is not given explicitly, it is reasonable to assume that $\xi_{11} \geq \xi_{12}$ and $\xi_{22} \geq \xi_{21}$. It is not the case that the proportion of uninformed investors exceeds that of informed investors when they are considered suitable. It is the opposite when they are considered unsuitable. Informed investors tend to be suitable rather than unsuitable. On the contrary, uninformed investors are more likely to be unsuitable. This assumption is supported by plenty of prior studies (Choi et al., 2010; Van Rooij et al., 2011; Andersen and Nielsen, 2011; Cole et al., 2014). Choi (2013), for instance, shows that financial consumers with higher educational attainment tend to invest more in financial investment products even when other relevant variables are controlled for. Cole et al. (2014) report that years of schooling is positively associated with the possibility of having financial investments. Choi (2016) also shows that a sophisticated financial consumer has a larger diversification index, which indicates a relatively larger proportion of financial investments in the

portfolio.

Table 1. Distribution of investors

	Informed ($Y_i = 1$)	Uninformed ($Y_i = 2$)
Suitable ($X_i = 1$)	$\xi_{11} = n_{11}/N$	$\xi_{12} = n_{12}/N$
Unsuitable ($X_i = 2$)	$\xi_{21} = n_{21}/N$	$\xi_{22} = n_{22}/N$

3.2 FISC's Strategies and Investors' Choices

For investor i , the FISC complies with the suitability principle ($s_i = 0$) or not ($s_i = 1$), and complies with the explanation duty ($e_i = 0$) or not ($e_i = 1$). Thus, there are four possible combinations of strategies. On the other hand, let W_i be a random variable that indicates whether investor i chooses the financial investment product or not. It takes 1 if the investor chooses it and 0 otherwise.

$$W_i = \begin{cases} 0, & \text{with probability } 1 - \Omega_i \\ 1, & \text{with probability } \Omega_i \end{cases} \quad (1)$$

In (1), Ω_i denotes the probability that investor i chooses the product. The probability depends on the investor's type and, in general, increases with a high level of suitability and information status. It also depends on the FISC's strategies. If the FISC were to comply with the suitability principle, unsuitable investors would not choose the product. Likewise, if the FISC were to comply with the explanation duty, every investor would be able to make an informed choice. Table 2 describes how the probability of an investor choosing the product is determined according to the investor's type and the FISC's strategies. Only uninformed investors are misled by the FISC that breaches the explanation duty. The rationale for the underlying assumptions is as follows.

Table 2. Probability of investor i choosing the financial investment product

	$e_i = 0$ (comply)		$e_i = 1$ (breach)	
	$s_i = 0$ (comply)	p_{11}	p_{12}	$q_{11} (= p_{11})$
	0	0	0	0
$s_i = 1$ (breach)	p_{11}	p_{12}	$q_{11} (= p_{11})$	$q_{12} (> p_{12})$
	p_{21}	p_{22}	$q_{21} (= p_{21})$	$q_{22} (> p_{22})$

Note: Given the FISC's strategies, the sub-matrix represents the probability of choosing the financial investment product according to the investor's type.

(Case 1) $s_i = e_i = 0$

This is the most desirable case for the purpose of regulation. It can maintain the integrity of the financial investment markets and protect the rights and interests of the public through fair financial transactions. Since the FISC complies with the suitability principle, unsuitable investors have no chance of choosing the product. Thus, for an unsuitable investor i , $\Omega_i = 0$. Since the FISC also complies with the explanation duty, uninformed investors become cautious about choosing the product, as are informed investors. However, informed and uninformed investors' probabilities of choosing the product might be different.

(Case 2) $s_i = 0$ and $e_i = 1$

Unsuitable investors have a zero probability as long as the FISC complies with the suitability principle. For suitable investors, however, a breach of the explanation duty makes the probabilities change from p_{11} to q_{11} and from p_{12} to q_{12} . Based on the assumption that an informed investor is not affected by a breach of the explanation duty, q_{11} is the same as p_{11} . Furthermore, such a breach is aimed at inducing an investor to choose the product, and therefore, the probability that an uninformed investor chooses the product is greater, that is, $q_{12} > p_{12}$. In most mis-selling cases, investors allege that they would not have chosen the product if they had been given enough

information about the product.

(Case 3) $s_i = 1$ and $e_i = 0$

Compared with the first case in which $s_i = e_i = 0$, the only difference is that now, unsuitable investors might choose the product, because the FISC tries to sell it to them in breaching the suitability principle. The probabilities are given as p_{21} for unsuitable informed investors, and as p_{22} for unsuitable uninformed investors. It is straightforward that a breach of the suitability principle does not affect the probabilities of suitable investors. This is a suitable investor's advantage.

(Case 4) $s_i = e_i = 1$

This is the most undesirable case for the purpose of regulation because both rules are violated. In this case, the informed investor's advantage makes the probabilities remain the same, namely, p_{11} and p_{21} for suitable informed and unsuitable informed investors, respectively. For uninformed investors, the probabilities are q_{12} and q_{22} . They are assumed to be greater than p_{12} and p_{22} , respectively.

In summary, the probability of an investor choosing the financial investment product depends on the investor's type and, at the same time, the FISC's strategy. Thus, the probability is described as follows.

$$\begin{aligned} \omega_{11} &= Pr(W_i = 1 | X_i = 1, Y_i = 1) = p_{11}(1 - e_i) + q_{11}e_i = p_{11}, \\ \omega_{12} &= Pr(W_i = 1 | X_i = 1, Y_i = 2) = p_{12}(1 - e_i) + q_{12}e_i, \\ \omega_{21} &= Pr(W_i = 1 | X_i = 2, Y_i = 1) = [p_{21}(1 - e_i) + q_{21}e_i]s_i = p_{21}s_i, \\ \omega_{22} &= Pr(W_i = 1 | X_i = 2, Y_i = 2) = [p_{22}(1 - e_i) + q_{22}e_i]s_i. \end{aligned} \quad (2)$$

The first and third equations in (2) reflect the informed investor's advantage, that is, $p_{11} = q_{11}$ and $p_{21} = q_{21}$. The FISC is assumed to choose the same strategy for every investor, namely, $s_i = s \in \{0, 1\}$ and $e_i = e \in \{0, 1\}$ for all i . Then, the average probability of an investor choosing the product is given by

$$\bar{\omega} = \phi(s, e; p, q, \xi) = \omega_{11}\xi_{11} + \omega_{12}\xi_{12} + \omega_{21}\xi_{21} + \omega_{22}\xi_{22} \quad (3a)$$

With respect to s and e ,

$$\bar{\omega} = p_{11}\xi_{11} + p_{12}\xi_{12} + (q_{12} - p_{12})\xi_{12}e + (p_{21}\xi_{21} + p_{22}\xi_{22})s + (q_{22} - p_{22})\xi_{22}se \quad (3b)$$

Since $q_{12} > p_{12}$ and $q_{22} > p_{22}$, $\bar{\omega}$ is increasing with s and e . This implies that there is an incentive for the FISC to breach the suitability principle or explanation duty to increase its sales.

3.3 Investor's Return

Investor i 's return is defined as the percentage gain or loss that the investor earns from investing in the financial investment product, which is

$$r_i = \frac{(M'_i - M_i)}{M_i}$$

where M_i is the initial investment and M'_i is the final value of the investment. For simplicity, the return is assumed to be negative or positive as follows.

$$r_i = \begin{cases} r_-, & \text{with probability } \gamma \\ r_+, & \text{with probability } 1 - \gamma \end{cases} \quad (4)$$

In (4), γ not only means the probability that a negative return is realized but also reflects the extent to which an ascending or declining trend continues during the investment period. For instance, γ would be large in a recessionary period and very small in an expansionary period.

3.4 FISC's Expected Profit

An FISC's ultimate goal is to maximize its profit, which is defined as the difference between its revenue and cost. The revenue increases in proportion to the investment an investor makes. Since it depends on the probability of an investor taking the financial investment product, the revenue is also a random variable given by

$$R = \sum_{i=1}^N R_i = \sum_{i=1}^N \lambda W_i M_i$$

where λ means the ratio of fee revenue to investment (or the margin rate called in this study). Suppose that N investors make the same amount of investment M uniformly. The expected revenue is

$$E(R) = \lambda M \sum_{i=1}^N E(W_i) = \lambda M \sum_{i=1}^N \Omega_i = \lambda \bar{\omega} MN \quad (5)$$

An FISC's total cost consists of fixed, variable, and contingent costs. In particular, the latter cost is the compensation that is contingent on an investor's financial loss in case the FISC breaches the rules. Suppose that, for investor i , the ratio of total compensation to loss is determined by the authority in the following manner.

$$\alpha_i = \alpha_s s_i + \alpha_e e_i \quad (6)$$

where both α_s and α_e are positive, the sum of which is 1. Thus, the compensation is

$$C = - \sum_{i=1}^N \alpha_i \cdot \min(0, r_i W_i M_i)$$

Now that $M_i = M$, $s_i = s$ and $e_i = e$ for all i , the expected compensation is

$$E(C) = - \sum_{i=1}^N \alpha_i \cdot E[\min(0, r_i W_i M)] = -(\alpha_s s + \alpha_e e) r_- \gamma \bar{\omega} MN \quad (7a)$$

However, Equation (7a) holds on a strict liability basis. In other words, if an FISC were to breach the rules, it would have to compensate for an investor's loss regardless of what the investor's type is. According to the precedents for similar cases by the Supreme Court of Korea, a violation of the suitability principle does not make the FISC liable for a suitable investor's loss and even a breach of the explanation duty does not make the FISC liable for an informed investor's loss. Considering such a legal stance on the suitability principle and explanation duty, Equation (7a) becomes

$$E(C) = -[\alpha_e e \omega_{12} \xi_{12} + \alpha_s s \omega_{21} \xi_{21} + (\alpha_s s + \alpha_e e) \omega_{22} \xi_{22}] r_- \gamma MN \quad (7b)$$

Since the other cost components (i.e., fixed and variable) are not essential in this study, it is assumed that the contingent liability is the only source of an FISC's cost. Then, the expected profit is

$$E(\pi) = E(R) - E(C) = v(s, e) \cdot MN \quad (8)$$

where $v(s, e) = \lambda \bar{\omega} + [\alpha_e e \omega_{12} \xi_{12} + \alpha_s s \omega_{21} \xi_{21} + (\alpha_s s + \alpha_e e) \omega_{22} \xi_{22}] r_- \gamma$. This is the coefficient of MN . From Equations (3b), (5), and (7b), it is straightforward that the coefficient is a function of the FISC's strategy, which is a combination of $s \in \{0, 1\}$ and $e \in \{0, 1\}$. An FISC's strategy affects its revenue and cost in a trade-off manner.

3.5 FISC's Optimal Behavior

An FISC's objective is to maximize its expected profit, taking the natural and institutional parameters as given. As shown in Equation (8), the essential part of the expected profit is the coefficient, $v(s, e)$. Since the FISC's strategy can be described as a combination of two choice variables, s and e , there are four possible strategies, as follows.

(Strategy 1) $s = 0, e = 0$

$$v(0,0) = \lambda(p_{11} \xi_{11} + p_{12} \xi_{12}) \quad (9)$$

(Strategy 2) $s = 0, e = 1$

$$v(0,1) = \lambda(p_{11} \xi_{11} + q_{12} \xi_{12}) + \alpha_e r_- \gamma q_{12} \xi_{12} \quad (10)$$

(Strategy 3) $s = 1, e = 0$

$$v(1,0) = \lambda(p_{11} \xi_{11} + p_{12} \xi_{12} + p_{21} \xi_{21} + p_{22} \xi_{22}) + \alpha_s r_- \gamma (p_{21} \xi_{21} + p_{22} \xi_{22}) \quad (11)$$

(Strategy 4) $s = 1, e = 1$

$$v(1,1) = \lambda(p_{11} \xi_{11} + q_{12} \xi_{12} + p_{21} \xi_{21} + q_{22} \xi_{22}) + \alpha_e r_- \gamma (q_{12} \xi_{12} + q_{22} \xi_{22}) + \alpha_s r_- \gamma (p_{21} \xi_{21} + q_{22} \xi_{22}) \quad (12)$$

From Equations (9)-(12), it is obvious that the coefficient increases with λ but decreases with α_s , α_e , and γ because r_- is negative. Moreover, the incentive to violate the suitability principle is affected by the difference between Strategies 1 and 3. That is,

$$v(1,0) - v(0,0) = (\lambda + \alpha_s r_- \gamma)(p_{21} \xi_{21} + p_{22} \xi_{22}) \quad (13)$$

The difference between Strategies 1 and 2 is

$$v(0,1) - v(0,0) = \lambda(q_{12} - p_{12}) \xi_{12} + \alpha_e r_- \gamma q_{12} \xi_{12} \quad (14)$$

In Equation (14), $q_{12} - p_{12}$ is the increment in an uninformed investor's acceptance rate due to no explanation about the financial investment product. This is called the no-explanation effect (ε). Based on the above equations, it can be safely argued that an FISC would breach the suitability

principle and explanation duty if the fee and no-explanation effect were large enough to overwhelm the contingent loss factors.

$$v(1,1) - v(0,0) = \lambda[(q_{12} - p_{12})\xi_{12} + (p_{21}\xi_{21} + q_{22}\xi_{22})] + \alpha_e r - \gamma(q_{12}\xi_{12} + q_{22}\xi_{22}) + \alpha_s r - \gamma(p_{21}\xi_{21} + q_{22}\xi_{22}) \tag{15}$$

4. Simulation

An FISC's expected profit is dependent on its strategy and, at the same time, the inherent parameters. Thus, it is difficult to find a consistently dominant strategy over the others unless the parameter values are predetermined. Despite the absence of empirical data, it is meaningful to compute and compare the coefficients for a given set of the parameters. Table 3 summarizes the parameters chosen for the simulation. First, the investor distributions are divided into three different categories according to the suitability condition, which concerns how many investors are suitable. They are standard (i.e., equally distributed), suitable, and unsuitable distributions. Second, the acceptance rate matrixes are based on the notion that a suitable and informed investor is more likely to choose the financial investment product than an unsuitable and uninformed investor. Without proper explanation about the product, however, the acceptance rate of an uninformed investor would increase. This is reflected in the no-explanation effect (ϵ), which is assumed to be 0.2.

Table 3. Parameters for simulation

ξ	Standard	$\xi_{11} = 0.25, \xi_{12} = 0.25, \xi_{21} = 0.25, \xi_{22} = 0.25$	
	Suitable	$\xi_{11} = 0.40, \xi_{12} = 0.40, \xi_{21} = 0.10, \xi_{22} = 0.10$	
	Unsuitable	$\xi_{11} = 0.10, \xi_{12} = 0.10, \xi_{21} = 0.40, \xi_{22} = 0.40$	
p, q		$p_{11} = 0.7, p_{12} = 0.6, p_{21} = 0.5, p_{22} = 0.4$	
		$q_{11} = 0.7, q_{12} = 0.8, q_{21} = 0.5, q_{22} = 0.6$	
r, γ		$r_- = -0.10$	$\gamma = 0.25$
α	High	$\alpha_s = 0.5, \alpha_e = 0.5$	
	Low	$\alpha_s = 0.25, \alpha_e = 0.25$	

4.1 Strict Liability

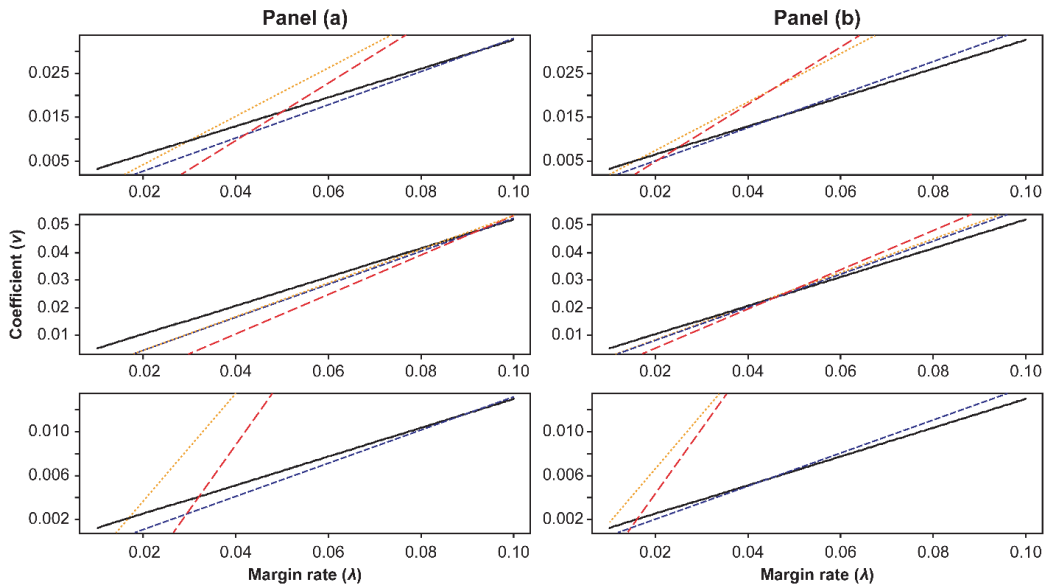
The first simulation is for the model under strict liability, in which the cost component is given by Equation (7a). Although case law does not follow the strict liability principle, a comparison between the two legal stances can give a meaningful implication. Based on the simulation results in Figure 1, it is obvious that the distribution of investors matters in affecting the incentive to follow the suitability and explanation rules. In Panel (a), in which the penalties for violation of the rules are stricter (higher α), Strategy 1 is dominates the others up to a considerably large value of λ for the suitable investors. The intersection of any two coefficient lines is called an equal-coefficient (or zero-difference) point, at which an FISC is indifferent between them. The λ values at the equal-coefficient points are 0.094 between Strategies 1 and 2, 0.085 between Strategies 1 and 3, and 0.093 between Strategies 1 and 4. Thus, an FISC hardly has an incentive to deviate from Strategy 1. This yields an important implication that the higher the proportion of suitable investors in an economy is, the lower is the possibility of violation of the rules. Even in Panel (b), in which the penalties are less strict, Strategy 1 dominates the other strategies as long as λ is small enough, that is, less than 0.042. In general, the rate is below 1 percent in the actual markets. Although Strategy 1 is dominated by any other strategy for larger values of λ , the differences between their coefficients are relatively small for a suitable investor population, compared with the differences in the upper diagram (i.e., standard investor population) and lower diagram (i.e., unsuitable investor population).

Second, comparing the movements of Strategies 1 and 2 gives a meaningful implication. In any case, Strategy 1 dominates Strategy 2 unless λ is large enough. Such a pattern is more prevalent in

Panel (a) than in Panel (b). In other words, if the penalties are strict enough, as in Panel (a), there is only a small possibility that an FISC would choose Strategy 2 over Strategy 1. Furthermore, the coefficient of Strategy 2 is slightly larger than that of Strategy 1, even for larger values of λ . The gap between Strategies 1 and 2 is incomparably smaller than the gap between Strategies 1 and 3 as well as the gap between Strategies 1 and 4. Therefore, it can be argued that an FISC rarely has an incentive to violate the explanation duty only. Even in Panel (b), an FISC would choose Strategy 2 over Strategy 1 only when λ is large enough, that is, larger than 0.047. However, it is not the case in reality.

Third, Strategy 3 tends to dominate Strategy 4 in most cases. In particular, such a pattern is more conspicuous when the penalties are stricter. Even in Panel (b), Strategy 3 always dominates Strategy 4 as long as λ is smaller than 0.043. This characteristic pattern contains an important implication for the regulatory policy on mis-selling. To be more efficient, the regulation of mis-selling should focus on the suitability principle rather than the explanation duty. This does not mean that the explanation duty is less important. In both Panels (a) and (b), the coefficient movements of Strategies 3 and 4 are susceptible to the structure of investor population and the level of penalty. Except for the suitable investor population, it is likely that an FISC violates the suitability rule. If λ is large enough, both rules would be violated simultaneously. Consequently, regulating the suitability principle successfully can prevent an FISC from taking Strategies 3 and 4.

Under the strict liability system, the equal-coefficient point usually varies with the structure of investor population. In these particular results, however, the equal-coefficient point between Strategies 1 and 2 remains constant across the different investor populations, because the ratios of ξ_{11} and ξ_{12} are the same for all the population types.



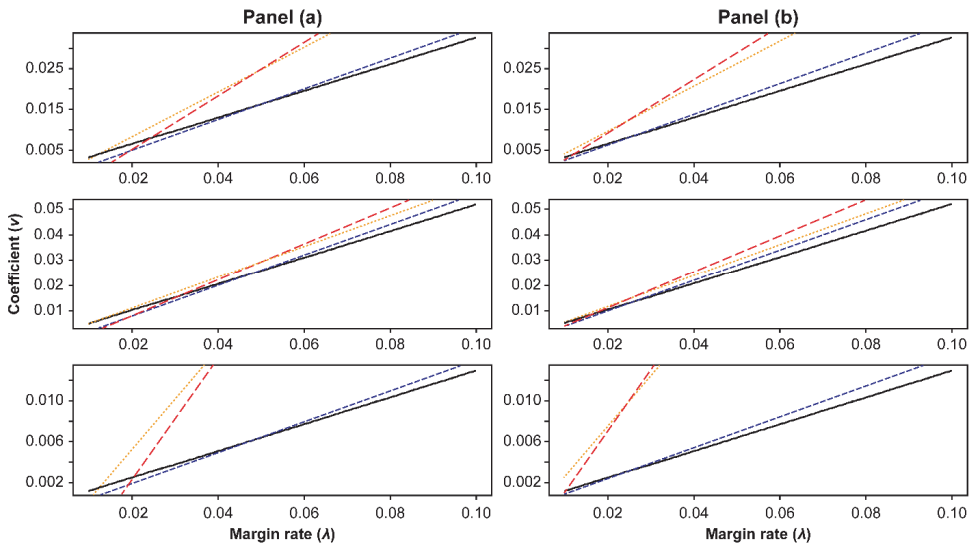
Note: The compensation-to-loss ratios are high ($\alpha_s = 0.5$ and $\alpha_e = 0.5$) in Panel (a) and low ($\alpha_s = 0.25$ and $\alpha_e = 0.25$) in Panel (b). In each panel, the top plot is for the standard investor distribution, the middle plot for the suitable investor distribution, and the bottom plot for the unsuitable investor distribution. The black solid line stands for Strategy 1, the blue dotted line for Strategy 2, the yellow solid line for Strategy 3, and the red dotted line for Strategy 4.

Figure 1. Coefficient changes with λ values under strict liability

4.2 Case Law

It was shown that, under strict liability, an ideal combination of strict penalty and suitability regulation can induce an FISC not to deviate from the norms regardless of population type. However, the court does not admit the strict liability of an FISC in reality. So, there is a greater possibility that the suitability and explanation rules are broken. Each plot in Figure 2 describes this situation distinctly in comparison to its counterpart in Figure 1. The formerly possible state now becomes an extraordinary exception in Figure 2. The slope differences among strategies are least for the suitable investor population. For any type of investor population, the slope of Strategy 2 is the closest to the slope of Strategy 1. The slopes of Strategies 3 and 4 are susceptible to the structure of investor population and the level of penalty.

Compared with Figure 1, some different patterns appear in Figure 2. First, stricter penalties do not work effectively under the case law system because the dominance of Strategy 1 is extremely rare even in Panel (a). Second, the overall dominance of Strategy 3 over Strategy 4 no longer holds in Panel (a). Strategy 3 dominates Strategy 4 only for very small values of λ . For these reasons, stronger regulation of the suitability principle does not necessarily result in reducing the possibility that an FISC violates the explanation duty. In other words, the efficiency of mis-selling regulation through the suitability principle vanishes under case law. Nonetheless, stronger regulation of the suitability principle would be effective if it were undertaken with stricter penalties and a sufficiently small λ , that is, less than 0.05. With less strict penalties, as in Panel (b), the effectiveness of the suitability principle requires λ to be less than 0.025. Under the case law system, even an ideal combination of strict penalty and suitability regulation is only a limited regulatory scheme and thus the balanced and complementary enforcement of the suitability principle and explanation duty is essential for mis-selling regulation. Note that $q_{12} = p_{12} + \varepsilon$, which means that at a given λ value, an FISC is more likely to violate the suitability rule than the explanation duty regardless of investor population type.



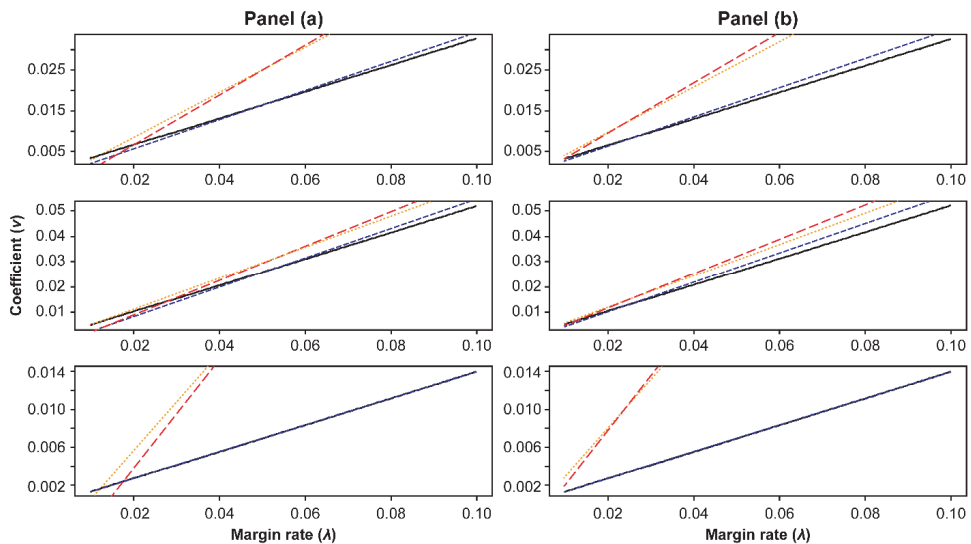
Note: The compensation-to-loss ratios are high ($\alpha_s = 0.5$ and $\alpha_e = 0.5$) in Panel (a) and low ($\alpha_s = 0.25$ and $\alpha_e = 0.25$) in Panel (b). In each panel, the top plot is for the standard investor distribution, the middle plot for the suitable investor distribution, and the bottom plot for the unsuitable investor distribution. The black solid line stands for Strategy 1, the blue dotted line for Strategy 2, the yellow solid line for Strategy 3, and the red dotted line for Strategy 4.

Figure 2. Coefficient changes with λ values under case law

4.3 Informed Investor Population

The third simulation is about the effect of financial education on mis-selling regulation, both of which seemingly have nothing to do with each other. However, the structure of investor population plays an important role in the subject matter of this study. The related hypothesis is that financial education enhances uninformed investors' financial literature, and the proportion of informed investors finally increases. Accepting this hypothesis, the patterns shown in Figure 3, in comparison to those in Figure 2, validate the claim that enhancing financial capability can reduce the possibility that an FISC violates the explanation duty. This is because the gaps between Strategies 1 and 2 are smaller in Figure 3 than in Figure 2. The claim also holds for the gaps between Strategies 3 and 4. A fairly straightforward interpretation of the results is that a reduction in the proportion of uninformed investors can lessen an FISC's incentive to violate the explanation duty. However, the incentive to violate the suitability principle is not necessarily affected.

Another interesting point is that, for the unsuitable investor population, the equal-coefficient point between Strategies 1 and 2 is not unique. Since the two coefficient lines are exactly the same, there are infinitely many equal-coefficient points. Even though this is a special case in which $\xi_{12} = 0$, it gives rise to an important question about the group of suitable but uninformed investors. The result implies that explanation or giving information is more necessary for suitable but uninformed investors than for unsuitable and uninformed investors. This is an obvious contradiction of the claim that explanation or giving information is more necessary for unsuitable and uninformed investors than for suitable and informed investors, because the unsuitable and uninformed usually belong to the most vulnerable and disadvantageous group in an economy. The suitability principle is a more effective and direct way to protect unsuitable and uninformed investors. The findings of this study provide a useful implication for how to allocate regulatory resources especially when they are limited.



Note: The compensation-to-loss ratios are high ($\alpha_s = 0.5$ and $\alpha_e = 0.5$) in Panel (a) and low ($\alpha_s = 0.25$ and $\alpha_e = 0.25$) in Panel (b). In each panel, the top plot is for the standard investor distribution, the middle plot for the suitable investor distribution, and the bottom plot for the unsuitable investor distribution. The black solid line stands for Strategy 1, the blue dotted line for Strategy 2, the yellow solid line for Strategy 3, and the red dotted line for Strategy 4. The investor population has more of the informed and less of the uninformed by adding $(0.1, -0.1, 0.1, -0.1)$, which is an adjustment vector, to each investor distribution vector in Table 3.

Figure 3. Coefficient changes with λ values under case law (population with larger shares of the informed)

Under the strict liability system, the suitable investor population is more desirable than any other type of population for compliance with the rules. Under the case law system, however, the former type no longer maintains its dominance. Rather, it shows the largest difference between Strategies 1 and 2. Given a larger positive difference between Strategies 1 and 2, an FISC is more likely to violate the explanation duty. In addition, it makes it more difficult for the regulatory body to take remedial action. This emphasizes the importance of the investor population structure. There are more effective and appropriate regulatory means according to the population type. For instance, both rules are necessary for the suitable investor population, whereas stricter regulation on the suitability principle is necessary for the unsuitable investor population.

5. Conclusions and Remarks

Mis-selling is one of the most frequently raised issues in relation to financial consumer protection. It is expanding, especially in financial investment products characterized by risk and complexity. Looking at past cases, there is always a possibility that mis-selling may occur at once on a large scale, causing massive damage to financial consumers. Therefore, it is desirable to implement the regulatory system that can control and prevent mis-selling. Considering the current regulatory framework, this study is aimed at creating a theoretical model that can explain the main factors related to mis-selling and their interactions. Those factors are the distribution of investor population, an FISC's objective of profit maximization, and the damage compensation structure. Using the model, simulations are conducted to examine the effectiveness of the regulatory settings. Some notable findings are as follows.

Strict liability turns out to be very effective to prevent mis-selling, that is, the violation of the suitability principle and explanation duty. Considering the fact that the rate of margin is usually below 1 percent, there is little chance that an FISC violates only the explanation duty. However, the possibility that an FISC violates the suitability principle is considerable under case law and becomes larger especially for unsuitable investor population. Although both rules are important, more emphasis should be placed on the suitability principle in terms of efficient regulation. The explanation duty is generally believed to be necessary for all uninformed investors, but more effective for suitable uninformed investors. On the other hand, the distribution of investor population plays an important role in regulation of mis-selling. Financial education enhances investors' financial capability and the proportion of suitable and informed is increased. As a result, it helps to reduce an FISC's incentive to violate the rules. This is a meaningful link between business conduct regulation and financial education, which are the two pillars in financial consumer protection. Thus, it is strongly recommended that a regulatory body utilizes this synergy between the conduct regulation and financial education. Strengthening both would make more desirable effects in a complementary way. The FSS in Korea focuses on this.

Still, there are some limitations of this study. First, setting parameters for simulation is rather arbitrary, although done with deliberation. If there were information on the exact distribution of investors, more practical analysis would be possible. In reality, an FISC cares for its reputation and would not take risk for only a small profit. Also, there are more additional costs incurred than the contingent cost when violating the rules. Considering this, the actual possibility of violation is lower than that expected in the model. Moving forward, further research is needed on the investor distribution and identification of suitability. Also, analytical approaches in the behavioral context (Foxall, 1996; Foxall & Greenley, 2000) would be useful.

References

Andersen, S., & Nielsen, K. M. (2011). Participation constraints in the stock market: Evidence from unexpected inheritance due to sudden death. *The Review of Financial Studies*, 24(5), 1667-1697.

- Bolster, P. J., Janjigian, V., & Trahan, E. A. (1995). Determining investor suitability using the analytic hierarchy process. *Financial Analysts Journal*, 51(4), 63-75.
- Chang, E. C., Tang, D. Y., & Zhang, M. B. (2015). Suitability checks and household investments in structured products. *Journal of Financial and Quantitative Analysis*, 50(3), 597-622.
- Choi, C. (2013). Financial status and behaviors of female-headed households in South Korea: On the financial consumer policy implications. *Journal of Consumer Studies*, 24(2), 123-151.
- Choi, C. (2016). Financial status and portfolio selection of Korean female-headed households, *Financial Planning Review*, 9(1), 155-177.
- Choi, J., Laibson, D., & Madrian, B. (2010). Why does the law of one price fail? An experiment on index mutual funds. *Review of Financial Studies*, 23(4), 1405-1432.
- Cole, S., Paulson, A., & Shastry, G. K. (2014). Smart money? The effect of education on financial outcomes. *The Review of Financial Studies*, 27(7), 2022-2051.
- Direr, A., & Visser, M. (2013). Portfolio choice and financial advice. *Finance*, 34(2), 35-64.
- Financial Supervisory Service (2014). 2013 Annual Report. [Online] Available: <https://www.fss.or.kr/eng/bbs/Bo000215/view.do?nttId=42379&menuNo=400011&pageIndex=1>
- Financial Supervisory Service (2015). 2014 Annual Report. [Online] Available: <https://www.fss.or.kr/eng/bbs/Bo000215/view.do?nttId=42380&menuNo=400011&pageIndex=1>
- Foxall, G. (1996). *Consumers in Context: The BPM Research Program*. Routledge: London.
- Foxall, G. & Greenley, G. E. (2000). Predicting and explaining responses to consumer environments: An empirical test and theoretical extension of the behavioral perspective model. *The Service Industries Journal*, 20, 39-63.
- Gray, J. (2004). The legislative basis of systemic review and compensation for the mis-selling of retail financial services and products. *Statute Law Review*, 25(3), 196-208.
- Halan, M., Sane, R., & Thomas, S. (2014). The case of the missing billions: Estimating losses to customers due to mis-sold life insurance policies. *Journal of Economic Policy Reform*, 17(4), 285-302.
- Inderst, R., & Ottaviani, M. (2009). Misselling through agents. *American Economic Review*, 99, 883-908.
- Koh, B. S. K., Koh, F., Chuen, D. L. K., Guan, L. K., Ng, D., & Fai, P. K. (2015). A risk- and complexity-rating framework for investment products. *Financial Analyst Journal*, 71(6), 10-28.
- Leece, D. (2000). Inappropriate sales in the financial services industry: The limits of the rational calculus?. *Managerial and Decision Economics*, 21, 133-144.
- Stace, V. (2015). New Zealand's financial adviser regulation: Falling behind in the wake of overseas reforms. *New Zealand University Law Review*, 26(4), 869-894.
- Van Rooij, M., Lusardi, A., & Alessie, R. (2011). Financial literacy and stock market participation. *Journal of Financial Economics*, 101(2), 449-472.