Small-sized asset owners' OCIO selections and evaluations

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Abstract

This study analyzes small-sized asset owners' optimal choice problems in selecting an outsourced chief investment officer (OCIO). While large-sized asset owners can select OCIOs through procurement auctions, it is difficult for small-sized asset owners to use this method. Instead, they access OCIO services by participating in an investment pool or utilizing OCIO funds. In this study, the authors compare the two OCIO selection methods. The authors construct an agent-based model for OCIO selection to reflect the heterogeneity in production efficiency and preferences. The results of this study imply that when the market has enough investment pools, the utility of all small-sized asset owners increases. To enhance the growth in the OCIO market, the investment pool should represent the preferences of small-sized asset owners and enable individual owners to find an appropriate OCIO.

Keywords Agent-based simulation, Multidimensional auction, Outsourced chief investment officer (OCIO), OCIO evaluation, Posted-price market, Small-sized asset owners

Paper type Research paper

1. Introduction

Changes in the corporate retirement pension program are expected to encourage the participation of small-sized asset owners in the outsourced chief investment officer (OCIO) market. The most important change is the introduction of the small- and medium-sized enterprise (SME) retirement pension fund program. This program introduces a fund-type retirement pension plan only for SMEs that is an alternative to the existing defined contribution plans. An SME employer establishes a separate external committee and manages the fund through the committee (Kim and Ryu, 2020). This plan reduces the direct management burden of workers and secures economies of scale, which can be advantageous in terms of return on investment. In addition, governance can be improved by including work members in the committee. The SME retirement pension fund program is viewed as a partial introduction of a fund-type retirement pension plan. If this program works well, its scope can be expanded. These changes in the retirement pension program mean that many small-sized asset owners, such as corporate retirement pension funds, may emerge as consumers in the OCIO market. As the Korean OCIO market grows, discussing how small-sized asset owners select OCIOs is important. The OCIO means outsourcing the chief investment officer. However, it can be described as a delegated asset management method that comprehensively entrusts authorization for strategic asset allocation to someone outside the firm. An OCIO provides a comprehensive asset management service with a wider scope of authority than

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that of existing asset management services (Park *et al.*, 2021). The Korean OCIO market may change depending on how they utilize OCIO services. Accordingly, we analyze the methods small-sized asset owners use to select OCIOs.

Currently, the Korean OCIO market is dominated by large-sized public funds. They normally select OCIOs by procurement auction. In the OCIO procurement auction process, an asset owner announces they intend to select an OCIO and presents their evaluation criteria. The asset owner evaluates the bidders (i.e. OCIO providers) and selects their OCIO. However, it is difficult for small-sized asset owners to utilize procurement auctions because the profits for OCIOs of small-sized asset owners are relatively small. Thus, providers are reluctant to actively participate in small-sized asset owners' OCIO procurement auctions. Ryu and Park (2022) present two OCIO selection methods that small-sized asset owners can choose. The first is for small-sized asset owners to collectively form an investment pool, thus creating a large-sized asset owner through pooling; this allows them to adopt a procurement auction. The second way is to utilize OCIO funds. As the OCIO market grows, OCIO providers have begun launching mutual funds called OCIO funds that use long-term asset allocation strategies. The main targets for these funds are long-term investors, including small-sized asset owners.

The objectives of this study somewhat differ from those of existing studies in two ways. First, unlike existing OCIO studies focusing on an OCIO's agency problem, this study examines a fund's OCIO selection method. An analysis of the agency problem focuses on OCIO supplier decision-making, neglecting the analysis of OCIO consumers. Second, this study intensively analyzes small-sized asset owners' decision-making. The existing studies are centered on large-sized asset owners because they are the main consumers in the current OCIO market. However, the revision of the retirement pension program may increase the number of small-sized asset owners participating in the OCIO market, which increases the need to analyze how small-sized asset owners make decisions in the OCIO market.

We construct an agent-based model (ABM) to analyze small-sized asset owners' OCIO selection methods. This study compares three scenarios and analyzes them according to the level of constraints that arise from forming investment pools. By simulating the ABM, we find that lower constraint levels increase asset owners' utility; moreover, each investment pool's size becomes larger. These results suggest that for small-sized funds to efficiently utilize OCIO services there must be a platform where funds can exchange information to form large investment pools. Accordingly, two potential platforms suitable for forming an investment pool targeting small-sized asset owners are reviewed in this study. The first platform involves forming an investment pool through government policy; the second would be formed through private enterprise. OCIO funds can serve as a platform for raising funds with similar preferences. Using OCIO search consultants is also a method that employs private companies. In developed countries such as the United States, whose OCIO market is considered advanced, OCIO search consultants represent asset owners' OCIO search problems to assist the funds in finding OCIOs that suit them. This means that consultants play a role in reducing the constraints small-sized asset owners face in forming investment pools.

The remainder of this paper is organized as follows. Section 2 reviews the literature, while section 3 constructs an ABM for OCIO selection and reports the simulation results. Section 4 explains the policy implications of the results, and Section 5 concludes the paper.

2. Literature review

Prior studies on the Korean OCIO market focus on its agency problem. Some studies attribute an OCIO's low return to the agency problem. An OCIO risks agency problems similar to those of other delegated asset managers because asset owners and managers are separated (Clark and Urwin, 2017). Yoon and Lee (2019) argue that a fee structure where a higher proportion of the total fee comes from operations rather than performance causes the OCIO agency problem. Shin

and Lee (2020) suggest that managers' risk aversion is the reason. They argue that the OCIO's agency problem can be solved by having a higher proportion of the total fee from performance and using a longer evaluation period. However, consumers in the OCIO market use OCIO services to improve returns and manage risks (Shin *et al.*, 2020). An OCIO's negligence in risk management can also be an agency problem. Accordingly, Ryu and Park (2020) analyze the OCIO's agency problem in terms of both return and risk management performance. Their mathematical model shows that higher performance fees can negatively affect risk management performance; thus, asset owners need to expand their expertise in monitoring the OCIO.

Existing studies do not consider that asset owners with different investment goals have different preferences for OCIO services. If asset owners' heterogeneous demands are not considered, a single OCIO provider may monopolize the market, which does not clearly explain the real market in which different OCIO providers are selected. Accordingly, this study expands existing studies by considering asset owners' different preferences for OCIO service qualities. In addition, previous studies do not explain how small-sized asset owners choose their OCIOs. With the introduction of the fund-type retirement pension program, more small-sized asset owners are expected to use OCIO services. Therefore, this study compares two methods of selecting OCIOs—(1) using procurement auctions by forming investment pools and (2) OCIO funds—to analyze which is more advantageous for asset owners.

OCIO procurement auctions and OCIO funds are ways to utilize OCIO services. Therefore, it is necessary to review the transaction method of goods. There are various forms of trading goods. Wang's (1995) research largely divides transaction methods into bargaining, posted-price selling and auction methods. Several studies examine the optimal types of transactions from the perspectives of buyers, sellers, and markets. Wang (1993) compares auctions and posted-price selling and shows that if there is no cost to hold an auction, the auction method is always optimal for buyers. Bulow and Klemperer (2009) intuitively explain that sellers prefer an auction to posted-price selling because an auction creates competition among buyers (i.e. bidders). Competition among bidders results in more favorable prices for sellers (Hidvegi *et al.*, 2006). In contrast, Einav *et al.* (2018) point out that there has been a decrease in the proportion of auctions in the online market. They attribute this phenomenon to online market consumers placing a higher value on convenience. These conflicting results suggest that the appropriate transaction method may vary depending on the market situation.

Comparing OCIO procurement auctions and OCIO funds is similar to the discussion on auction versus post–price selling. In the Korean OCIO market, OCIOs are currently being selected primarily through public procurement auctions because the main consumers are large-sized public funds (Park and Ryu, 2022). Large-sized public funds are likely to prefer procurement auctions because they tend to prefer not to delegate strategic decision-making. However, since small-sized asset owners lack bargaining power over OCIO providers, it is difficult for them to claim strategic decision-making power over OCIO providers as large-sized public funds do. Therefore, small-sized asset owners will not utilize procurement auctions unless they form an investment pool with other asset owners. If many small-sized asset owners participate in the market, they will move to posted-price selling, where OCIO funds are mainly traded in the long term. This study compares preferences for procurement auctions and OCIO funds to predict the market changes that may occur when the proportion of small-sized asset owners in the OCIO market increases.

This study uses ABM for its analysis. In ABM, the agent refers to an object that is given decision-making and interaction ability and autonomously judges and makes decisions in a virtual space (Axtell *et al.*, 1996). ABMs make it easy to consider agents' heterogeneous characteristics (Rahmandad and Sterman, 2008). In a limited information situation where it is difficult for individual agents to know others' decisions, the complexity of agents' interactions makes it difficult to find the equilibria in a mathematical model (Epstein, 1999). ABM is suitable for analyses that use simulation. An agent-based simulation consists

of constructing a complex ABM and observing a certain pattern in the behavioral results of agents through simulation (Cristelli, 2013).

In this study, the agents are heterogeneous in the following properties. Funds are heterogeneous in their size and preferences for OCIO services and managers are heterogeneous in supply costs. We define OCIO service quality by combining two quality factors. Each manager must pay high costs to increase quality factors unsuitable for them. Zhang and Brorsen (2009, 2011) propose an ABM for analyzing oligopoly games; Boyer *et al.* (2014) adopt this model to compare posted-price selling and auctions. Referring to these studies, we construct an ABM for the OCIO market and analyze OCIO selection methods through simulation.

3. Methodology

3.1 Model

OCIO selection methods for small-sized asset owners are analyzed in this section. Unlike large-sized asset owners, small-sized asset owners do not use procurement auctions to select OCIOs. Park and Ryu (2021) suggest two ways small-sized asset owners can use OCIO services. The first is by participating in an investment pool, which is a collection of small-sized asset owners that forms a large-sized fund. The investment pool then selects an OCIO through a procurement auction. The second way is to join an OCIO fund, where the manager collects funds to create a kind of investment pool. We use a simulation method to analyze which of the two methods is preferred by small-sized asset owners.

Our model assumptions are as follows. There are m OCIO providers and n small-sized asset owners in the economy. Investment pools are allocated for all asset owners with similar characteristics. If all small-sized asset owners wish to utilize OCIO services, they can participate in their own investment pool or join an OCIO fund. It is assumed that the asset owners are randomly assigned to their provisional investment pools according to arbitrary characteristics. If all of the asset owners in an investment pool agree to participate, the investment pool is settled.

After an asset owner is allocated to an investment pool, the asset owner chooses a method based on evaluation scores that are calculated according to price and quality. An OCIO's service quality includes a variety of factors. According to Shin *et al.* (2020), the factors include risk management, cost reduction, increased returns, quick decisions and strategic management. When evaluating quality factors, asset owners will also weigh different quality factors more heavily depending on their investment purposes or philosophies. The heterogeneous preferences of asset owners are reflected in this study by dividing OCIO service quality into two arbitrary qualities. Asset owners' preferences are defined as $\psi \in [0, 1]$, which indicates the weight placed on the second quality factor. Thus, if ψ is close to 0, the fund places greater weight on the first quality factor, and if ψ is close to 1, the fund places greater weight on the second quality factor. We assume that the individual funds' preference variables are independent of the division of the investment pool. The fund will benefit from the quality of OCIO services. If the quality is $q_1, q_2 \in [0, 1]$, respectively, the utility function is defined as in Equation (1) so that the marginal utility is diminishing in each quality ($\partial^2 U/\partial q_1^2 < 0$; $\partial^2 U/\partial q_2^2 > 0$), as in the general assumption for the utility function.

$$U(q_1, q_2|\psi) = \sqrt{\psi \cdot q_1 + (1-\psi) \cdot q_2} \tag{1}$$

The asset owner pays the OCIO an operation fee of $p \in [0, 1]$ in return for using the OCIO services. Based on the OCIO's price and quality, the asset owner calculates a score $S(p, q_1, q_2|\psi)$ as shown in Equation (2).

$$S(p, q_1, q_2|\psi) = U(q_1, q_2|\psi) - p \tag{2}$$

For those participating in the investment pool, the investment pool selects an OCIO through a procurement auction. In this case, we assume that the investment pool's preference is the average value of the participants' preferences. An OCIO provider receives income $R(p)$ as shown in Equation (3) by multiplying s, the size of the entire investment pool, by the management fee. s is the sum of the sizes of all participants in the investment pool.

$$R(p|s) = s \cdot p \tag{3}$$

An OCIO's cost is incurred according to its service quality. As with the general assumptions, the cost function marginally increases for quality factors ($\partial^2 C/\partial q_1^2 < 0$; $\partial^2 C/\partial q_2^2 > 0$). We assume that the OCIO's cost $C(q_1, q_2|\tau)$ is determined according to Equation (4), which consists of two quality factors, where the cost parameter is $\tau \in [0, 1]$.

$$C(q_1, q_2|\tau) = \frac{1}{2}\{(1-\tau)\cdot q_1 + \tau \cdot q_2\}^2 \tag{4}$$

Therefore, the OCIO's profit $\pi(p, q_1, q_2|\tau)$ is calculated as in Equation (5).

$$\pi(p, q_1, q_2|s, \tau) = R(p|s) - C(q_1, q_2|\tau) = s \cdot p - \frac{1}{2}\{(1-\tau)\cdot q_1 + \tau \cdot q_2\}^2 \tag{5}$$

OCIO providers earn profits if they are selected as OCIOs, but they do not earn profits otherwise. They are selected as OCIOs when their score is higher than that of other managers, so an OCIO provider's profit function $\phi(p, q_1, q_2|s, \tau, \psi)$ is as calculated in Equation (6). S_i indicates the score of OCIO provider i, and S_{-i} indicates the largest value among the scores of OCIO providers excluding i. We assume that there is no tying.

$$\phi(p, q_1, q_2|s, \tau, \psi) = \begin{cases} s \cdot p - s^2 \cdot \{(1-\tau)\cdot q_1 + \tau \cdot q_2\}^2, if\ S_i > S_{-i} \\ 0, if\ S_i < S_{-i} \end{cases} \tag{6}$$

OCIO providers establish strategies to maximize their expected profits. Therefore, the objective function is shown in Equation (7).

$$E[\phi(p, q_1, q_2|s, \tau, \psi)] = \Pr[S_i > S_{-i}] \cdot \pi(p, q_1, q_2|s, \tau, \psi) \tag{7}$$

OCIO providers judge that the higher the score given according to their strategy, the more likely they are to be selected as an OCIO. The probability function to be selected as an OCIO ranges between 0 and 1 and must be defined as a differentiable increasing function. Accordingly, in this study, the probability is calculated using a sigmoid function defined in the entire real number as in Equation (8), which is an increasing function that derives a result value between 0 and 1. In reality, OCIO providers estimate their probability of being selected as an OCIO based on many factors, including prices and qualities. In this study, it is impossible to consider all criteria, so factors other than price and quality are reflected as a random variable, ϵ. ϵ follows a standard normal distribution ($\epsilon \sim N(0, 1)$). Therefore, it is assumed that the probability of being selected as an OCIO ($\Pr[S_i > S_{-i}]$) is as shown in Equation (9).

$$\sigma(x) = \frac{e^x}{e^x + 1} \tag{8}$$

$$\Pr[S_i > S_{-i}] = \sigma(S(p, q_1, q_2|\psi) + \epsilon) \tag{9}$$

An OCIO provider determines its price and quality factors to maximize its expected profit function by substituting the probability from Equation (9) into Equation (7). The investment pool selects the OCIO provider with the highest score as its OCIO. The individual asset owners' profits that can be obtained through the investment pool are determined by the price and quality factors presented by

the investment pool's OCIO. When an investment pool is formed, the fund calculates the score based on the price and quality factors of the OCIO determined through this process.

OCIO providers determine OCIO funds' price and quality factors based on their predictions of market demand and average preferences. We assume that ψ_M, the average market preference predicted by the manager, is uniformly distributed between 0 and 1. The higher the score, the greater the market demand will be. The average market size predicted by an OCIO provider is shown in Equation (10). σ indicates a sigmoid function defined in Equation (8). As in Equation (9), ϵ indicates factors other than price and quality and is a random variable following a standard normal distribution ($\epsilon \sim N(0,1)$).

$$E[D] = \sigma(S(p, q_1, q_2|\psi_M) + \epsilon) \tag{10}$$

The OCIO provider creates an OCIO fund at a price and with quality factors that maximize the expected profit in Equation (11), according to the market demand estimated in Equation (10).

$$E[\phi(p, q_1, q_2|\tau)] = E[D] \cdot p - C(q_1, q_2|\tau) \tag{11}$$

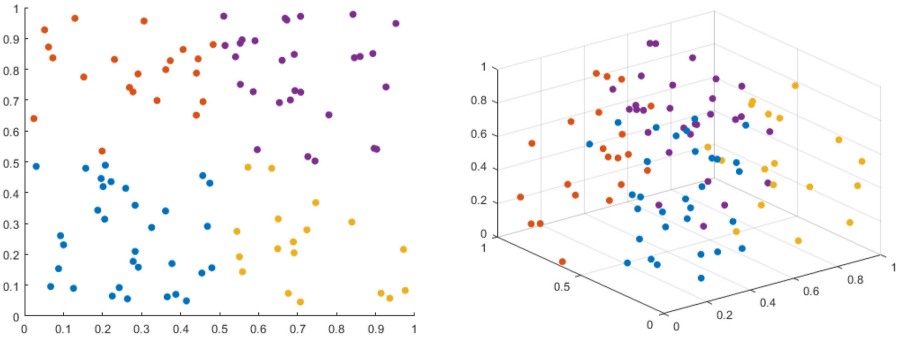
An asset owner chooses the OCIO fund with the highest score. Furthermore, asset owners compare the score of participating in an investment pool with that of an OCIO fund, choosing the method with the higher score. The investment pool is maintained only when all asset owners in the assigned group agree.

3.2 Simulation results

In this study, 10,000 simulations are conducted for each scenario. When small-sized asset owners participate in the OCIO market, the number of asset owners is sufficiently large compared to the OCIO providers in the market. Thus, in this study, the number of managers (m) is set to five, and the number of funds (n) is set to 100. Each asset owner is assigned a size (s) and preference (ψ) through a random number from which a value between 0 and 1 is uniformly extracted. The method used to allocate the investment pool is as follows. First, each fund is randomly placed in a two-dimensional (2D) space. We assume that the space is divided into arbitrary sections, and the formation of the investment pool can be discussed only between the funds placed in the same section. Panel A in Figure 1 shows that each asset owner is allocated to four investment pools by dividing the 2D space into four sections.

In this study, we analyze cases where there are four or nine investment pools and cases where there is no investment pool and all individual asset owners subscribe to the OCIO funds. The number of investment pools is set to four and nine to divide the 2D space equally. The size of the allocated investment pool is the sum of the sizes of the asset owners allocated to the investment pool, and the investment pool's preference is the average value of the preferences of the asset owners allocated to the investment pool. The cost parameter (τ) of each OCIO provider is set from 0.2 to 1 at intervals of 0.2. This setting ensures that OCIO providers are evenly distributed, avoiding differences in outcomes resulting from an OCIO provider's concentration on a particular cost parameter.

After the parameters for the fund, investment pool and management company are set, and the individual agents' decision-making proceeds. First, each investment pool's OCIO selections are made. All OCIO providers participate in the investment pool's OCIO procurement auction. They bid in the auction by determining the price (p) and quality factors (q_1, q_2) that maximize their expected profit, as shown in Equation (7). The investment pool calculates the OCIO provider's evaluation score based on its price and quality factors and their preferences. Then it selects the manager with the highest score as the OCIO. Regarding posted-price selling, asset owners determine the price and quality factors that maximize the expected profit in Equation (11). Each OCIO provider's estimate of the market preference is given by generating a random number uniformly distributed between 0 and 1.



Panel A. Positions of each asset owner

Panel B. Positions and preferences

Note(s): This figure shows how asset owners are randomly allocated to four investment pools. Each dot represents an asset owner. Panel A shows the allocation of individual asset owners to four investment pools after randomly placing them in a 2D space. The dot colors differ for each allocated investment pool. Panel B shows that investment pool assignments are made regardless of preference. The plane of the floor is the same as in Panel A, and the height represents each fund's preference. The dot color represents the investment pool to which funds are allocated

Figure 1.
Investment pool random allocation

When the investment pool's OCIO selection and the OCIO fund's choice on price and quality factors are finished, the asset owner decides whether to join the investment pool or the OCIO fund. In this process, the fund calculates the score by considering the price and quality factors suggested by the investment pool's OCIO and their own preferences. Similarly, scores are calculated for each OCIO fund by considering price and quality factors. Asset owners select the alternative with the highest score. The investment pool is settled when all asset owners determine to participate the investment pool. This simulation process is repeated in scenarios with four or nine investment pools. In the case of a scenario where all funds can only join the OCIO fund because no investment pool is assigned to the asset owners, the process of allocating the fund's investment pool and the investment pool's OCIO selection process are omitted. Table 1 summarizes the simulation results. Each column represents the simulation results according to the constraint level, and each cell shows the average value and its standard deviation.

The number of maintained investment pools shows the level of participation in the fund's investment pool. In both cases of four and nine investment pools, it seems that, on average, two investment pools are maintained. However, the size of the individual investment pools is about twice as large in the case of four investment pools compared to that in the case of nine investment pools. This means that there is lower participation in the investment pools when there are many investment pools than when there are few investment pools. As the number of investment pools increases, joining the OCIO fund is often a more advantageous option for individual asset owners than participating in the investment pool. The cases in which investment pools are allocated produce more favorable results on average for the asset owners than the case with no investment pool. When there are four investment pools, the average score is the highest, and the average fee is the lowest. However, when there are nine investment pools, the size of the funds participating in the investment pool is small compared to when there are four investment pools, so the average score is relatively low, and the average fee is high. On average, the most unfavorable market for asset owners occurs when all asset owners join the OCIO. It is advantageous for individual funds to participate in the investment pool and have high bargaining power in selecting and evaluating the OCIO. This

	4 investment pools	9 investment pools	No investment pool
Number of maintained investment pools	1.9412	2.0234	·
	(0.7630)	(1.9463)	
Size of investment pools	1.1919	0.5966	·
	(0.2535)	(0.1925)	
Score	0.2500	0.2458	0.2414
	(0.0246)	(0.0230)	(0.0346)
Fee	0.4262	0.4352	0.4463
	(0.0171)	(0.0185)	(0.0455)
First quality factor	0.4748	0.4663	0.4725
	(0.0294)	(0.0396)	(0.0651)
Second quality factor	0.4359	0.4533	0.4658
	(0.1982)	(0.0436)	(0.0625)

Table 1.
Simulation results

is because large-sized asset owners can conclude contracts in their favor through procurement auctions. However, individual small-sized asset owners join OCIO funds even if they are somewhat different from their preferences. These results mean that the existence in the market of appropriately sized investment pools can increase the asset owners' utility.

4. Policy implications

The simulation results show that all asset owners' utility can be increased when there are appropriately sized investment pools in the market. In addition, forming an investment pool increases asset owners' average utility compared to not forming an investment pool. This result may be due to the bargaining power of large-sized asset owners. The larger the asset owner's size, the more likely it is that competition between OCIO providers will intensify during the auction process, resulting in favorable results for the asset owner. The OCIO fund proposed by the OCIO provider may be designed to benefit the provider, so small-sized asset owners that use it will suffer some losses. This result is similar to those in previous studies claiming that auctions are more advantageous for sellers than posted-price selling (Bulow and Klemperer, 2009; Hidvegi *et al.*, 2006; Wang, 1993). Therefore, for a small fund to use OCIO services efficiently, it is necessary to secure bargaining power by increasing its size through an investment pool. To this end, ensuring that an appropriately sized investment pool can be maintained is important. To accomplish this, it may be necessary to have a platform to collect small-sized asset owners.

Two kinds of platforms can be suggested. The first is through government policy. Depending on the policy goals, small-sized asset owners can be placed into one investment pool. The SME retirement pension fund falls into this category. However, if the SME retirement pension fund investment pool does not represent the preferences of its participants, it will be difficult to maintain the investment pool due to low participation in the pool. The importance of the SME retirement pension fund system is very high in that its performance can lead to expanding the fund-type retirement pension system. For the SME retirement pension fund to show successful results, it is important to increase SME participation. Efforts should be made to ensure that the investment pool represents the participating funds' preferences beyond providing incentives. Forming an investment pool through government policy may cause a problem if the investment pool size does not meet expectations depending on policy performance. If policy participation is low, the size of the investment pool will be small, and there is a limit below which it cannot function as an appropriate platform. Therefore, increasing the participation rate through an incentive system and active promotion is necessary to improve policy performance.

A second one is the private company method. The OCIO funds can be an indirect platform for merging small funds with similar management goals into one investment pool. OCIO funds may be

the only alternative for asset owners without adequate investment pools representing their preferences. When an individual OCIO provider manages the investments in the form of a fund, it has the advantage of securing the diversity of OCIO services. By offering different types of OCIO funds, OCIO providers can ensure that asset owners utilize OCIO services for their own purposes. For example, individual asset owners receive OCIO services tailored to their characteristics, such as risk neutrality and profit-seeking based on risk aversion. However, it is difficult for small-sized asset owners that lack information to find an OCIO fund suitable for them, so it is more difficult to reflect individual characteristics by forming an investment pool through an OCIO fund than through government policies. As the number of suppliers in the OCIO market increases and OCIO services become more diversified, these problems intensify. Thus, in the advanced OCIO market in the US, OCIO search consulting is considered to play an important role in the OCIO market (Ryu and Park, 2022). OCIO contracts typically involve an asset owner, an OCIO provider and managers to whom the OCIO providers delegate some proportion of the assets under their management. OCIO search consultants indirectly participate in OCIO contracts by recommending the most suitable OCIO provider in the market, considering the asset owner's investment goals and characteristics. According to a survey by the US market research firm Cerulli Associates, it is estimated that 36% of OCIO customers in the US use OCIO navigation consultants. This suggests that OCIO search consultants occupy an important share of the US OCIO market. An OCIO search consultant can serve as a platform to induce an OCIO to manage asset owners with similar characteristics.

5. Conclusion

As the Korean OCIO market grows, the entry of small-sized asset owners into the OCIO market is expected to increase. Accordingly, this study analyzes small-sized asset owners' OCIO selection processes using an ABM. Unlike large-sized asset owners, it is difficult for small-sized asset owners to select an OCIO through procurement auctions. Small-sized asset owners can instead choose to participate in an investment pool or OCIO funds. In this study, we construct an ABM for small-sized asset owners' OCIO selections and simulate the model using three scenarios that vary the number of investment pools. The simulation results show that asset owners' utility increases when there are an appropriate number of investment pools in the market. This suggests that a platform that enables the formation of investment pools is important for growth in the OCIO market.

This study reviewed two types of platforms. The first is an investment pool through government policy, which can help form an investment pool of small funds according to the policy's goal. The second is forming an investment pool through private companies. OCIO funds and OCIO search consultants can act as platforms to indirectly form an investment pool of asset owners. This study contributes to the literature by focusing on the decision-making of small-sized asset owners that are expected to enter the market. Based on the analysis results, we present policy implications by examining the form of a platform for an investment pool of small-sized asset owners. However, there is a limitation as the study does not organically consider the relationships of all market agents because we focus on small-asset owners' decision-making. In addition, among the characteristics of OCIO services, discussions related to governance are not adequately reflected. Therefore, follow-up research is needed that includes these topics.

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