Pre-Analysis Plan for "The Impact of Conditional Cash Transfers to Social Enterprises: Experimental Evidence from South Korea"

Authors: Syngjoo Choi[1], Booyuel Kim[2], and Sun Hyun Park[3]

July, 2023

Section 1: Introduction

The scope and magnitude of social problems have been exponentially increased due to accumulated market failures and inefficient government regulations. Social enterprises that pursue to create both financial and social values by operating a private sector business while reducing market failures are considered one of the effective and sustainable solutions to the social problems we experience. However, due to the positive externality of social values created by social enterprises and the situation where social values are not compensated in markets, the goods and services of social enterprises are sub-optimally provided in markets. One simple way to solve this market failure is to internalize the externality by subsidizing social enterprises according to the social value they created (social value performance). One prominent attempt is the Social Progress Credit (SPC) project, which is run by SK Group, the second-largest conglomerate in South Korea, the program of conditional cash transfers which measures social values created by the participating enterprises and provides cash rewards proportional to their social values.

This pre-analysis plan describes the hypotheses and specifications that will be used to understand the impact of the SPC project on social enterprises in South Korea. The organization of this pre-analysis plan is as follows: In section 2 we overview the study, the sample selection and the data that was and will be collected for this project. In Sections 3 and 4 we describe the hypotheses to be tested for this study and the specifications that will be performed during data analysis.

Section 2: Overview of the study

2.1 SK Group's SPC Project

In 2015, SK Group launched the SPC project, which provides cash incentives, based on annual social values created by the participating enterprises. Between 2015 and 2019, 222 mission-oriented enterprises had participated in the SPC project. The SPC project consists of two components: 1) measurement on social values created by the SPC enterprises and 2) conditional cash incentive proportional to its social performance. The main purpose of the first component is to produce reliable information on social values created that can be compared across enterprises of various business types.

---

[1] Professor, Department of Economics, Seoul National University, Seoul, Republic of Korea; syngjooc@snu.ac.kr

[2] Associate Professor, Graduate School of Environmental Studies, Seoul National University, Seoul, Republic of Korea; booyuel@snu.ac.kr

[3] Professor, Graduate School of Business, Seoul National University, Seoul, Republic of Korea; sunpark@snu.ac.kr

The SPC project developed a sophisticated measurement system that quantifies social performance in monetary value (Serafeim et al. 2020). This measurement system is innovative in that enterprise social value is measured based on the total monetary value created rather than on a simple count of input activities, which allows for yardstick comparisons between various types of social enterprises across different industries (Jung and Shin, 2022).

For the second component on cash incentive provision, the SPC project office verifies the measurement of annual social performance of participating enterprises for the corresponding fiscal year and awards the conditional cash incentives. For the first five years between 2015 and 2019, 222 enterprises in total cumulatively produced the social values of USD 167.5 million and USD 33.9 million, 20.2% of the social values created, were provided as cash incentives. Figure 1 summarizes the cumulative social values created between 2015 and 2019 with their corresponding cash incentives.

Figure 1. SPC Social Performance and Cash Incentives: 2015-2019

Year	2015	2016	2017	2018	2019
No. of Enterprises (cumulative)	44	94	130	188	222
Social Values created* (cumulative)	9.5	29.6	62	107.7	167.5
Cash Incentive* (cumulative)	2.6	7.3	14.6	23.3	33.9
Proportion of cash incentive to social values	27.4%	24.7%	23.5%	21.6%	20.2%

Notes: * unit - USD (US Dollar) million. Between the years 2015 and 2019, the exchange rate of the Korean Won (KRW) to the USD exhibited fluctuations, ranging from 1,241 (reaching its peak in February 2016) to 1,055 (hitting its minimum in April 2018). Throughout the study, a fixed conversion rate of KRW 1,000 = USD 1 was employed. The cash incentive for the first year was 25% of annual social value created. In the second and third year, the participating enterprises received the sum of 15% of annual social performance and 25% of the change in social performance relative to the previous year.

The first-phase SPC project recruited mission-oriented enterprises for five years between 2015 and 2019 but did not consider the control groups. Thus, it was difficult to directly evaluate the impact of the SPC project on financial and social performances of the participating enterprises. In the second-phase SPC project for the next five years (2020-2024), the research design has changed to an experimental evaluation setting with random assignment of the treatment and control group. This pre-analysis plan focuses on the evaluation plan for the second-phase SPC project.

2.2 Sample Selection

The second-phase SPC project plans to recruit the participating enterprises for five years (2020-2024) and to subsidize the enterprises' social value creation for the next three years. The first cohort of enterprises in 2020 will be rewarded for their social values in 2021, 2022, and 2023. Likewise, the

last cohort of this study in 2024 will receive cash rewards for their social values in 2025, 2026, and 2027.

The first cohort of 66 enterprises was selected in 2020. Among them, 30 enterprises were randomly assigned to the treatment group where cash rewards will be provided for the next three years based on their social value performances and the remaining 36 enterprises to the control group. The second cohort of 38 enterprises was selected in 2021. 20 enterprises were randomly assigned to the treatment group while 18 enterprises to the control group. The third cohort of 43 enterprises was selected in 2022. 20 enterprises were randomly assigned to the treatment group while 23 enterprises to the control group. The randomization balance tests for the first, second, and third cohorts as well as the combined cohorts confirmed that the firm characteristics, financial performances and social value performances in the baseline year were well balanced between the treatment and control groups.

2.3 Data Sources

The baseline survey for the first cohort was conducted in 2021 to measure the financial and social performances of 2020. The follow-up surveys for the first year (2021), the second year (2022), and the third year (2023) will be conducted in 2022, 2023, and 2024, respectively. Likewise, the baseline and follow-up surveys for the last cohort of 2024 will be conducted in 2025, 2026, 2027, and 2028, respectively. Thus, this SPC project will last until 2028. Figure 2 shows the timeline for the SPC project surveys.

Figure 2. Timeline for the SPC project surveys

	Cohort 1 (2020)	Cohort 2 (2021)	Cohort 3 (2022)	Cohort 4 (2023)	Cohort 5 (2024)
2020	recruitment and selection				
2021	baseline survey	recruitment and selection			
2022	1st follow-up / cash incentive for 1st year	baseline survey	recruitment and selection		
2023	2nd follow-up / cash incentive for 2nd year	1st follow-up / cash incentive	baseline survey	recruitment and selection	
2024	3rd follow-up / cash incentive for 3rd year	2nd follow-up / cash incentive	1st follow-up / cash incentive	baseline survey	recruitment and selection
2025		3rd follow-up / cash incentive	2nd follow-up / cash incentive	1st follow-up / cash incentive	baseline survey
2026			3rd follow-up / cash incentive	2nd follow-up / cash incentive	1st follow-up / cash incentive
2027				3rd follow-up / cash incentive	2nd follow-up / cash incentive
2028					3rd follow-up / cash incentive

Notes: The recruitment and selection process starts in July and ends in October. The baseline survey and the follow-up surveys are administered in February and March. The cash incentive for the previous year is awarded in August. Thus, a firm in the treatment group will receive its first cash incentive award two years after the recruitment and selection process.

The financial performances will be measured based on the financial statements of the participating enterprises examining the accounting items such as sales, cost of sales, operating income, non-operating income, net income, assets, current assets, non-current assets, liabilities, current liabilities, and non-current liabilities. The social value performances will be measured based on the items in four dimensions such as 1) employment performance, 2) social service performance, 3) environmental performance, and 4) community performance. [4] The detailed examples for each social value performance are presented in Tables 1-4 of Jung and Shin (2022).

---

[4] The employment performance is a social outcome by offering quality job opportunities for vulnerable social groups. The social service performance is a social outcome by providing goods and services to socially vulnerable groups. The environmental performance is a social outcome through production processes which reduce pollution or save natural resources. The community performance is a social outcome by vitalizing the local economy and contributing to local producers.

Section 3: Hypothesis

Our baseline and follow-up surveys have collected and will collect a large number of outcome variables in order to understand how the SPC project affects the enterprises' financial and social performances. A large body of prior literature reports that incentives promote greater effort, which in turn leads to improvement in the performance dimension where it is rewarded (Bonner and Sprinkle, 2002). The SPC cash incentives for social performance are likely to motivate higher efforts in the corresponding social activities. Furthermore, prior theoretical research on multitask settings predicts that incentive allocation across different tasks with clear outcome measures induces an agent to put more effort to a task with more incentives (Holmström and Milgrom, 1991). The SPC cash incentives for social performances would increase the opportunity cost of exerting effort on financial-related tasks, leading the enterprises to put more efforts into social value creation tasks. Consequently, we predict that the SPC cash incentives would increase the enterprises' effort on social-related tasks and result in improved social value performances, which leads to Hypothesis 3.1.

Hypothesis 3.1: *The SPC cash incentives will affect the average social performances of the participating enterprises.*

Although the primary objective of the SPC project is to promote social performances, several channels may influence the financial performance of participating enterprises. Firstly, the SPC cash incentive offers flexibility in its utilization, allowing for investments in areas such as R&D, which could subsequently impact the firm's financial performance. Secondly, positive reputational spillover from social to financial activities could lead to the sharing of corporate reputation for social performance among tasks or business units focused on financial pursuits. Thirdly, in environments where social and financial-related tasks are substitutes, allocating more time to social-related tasks may result in an increased marginal cost of spending time on financial-related tasks, potentially leading to decreased effort and lower financial performance, as theoretically predicted (Feltham and Xie, 1994). On the other hand, in cases of task complementarity, where efforts in one task positively influence the marginal cost or return on effort in another task, we anticipate that SPC cash incentives would boost financial performances for enterprises operating businesses with higher levels of task complementarity between social and financial-related tasks (Milgrom and Roberts, 1995; Holmström and Milgrom, 1991; Zhang, 2003; Nikias et al., 2005). These possible channels form the basis for Hypothesis 3.2 in our study.

Hypothesis 3.2: *The SPC cash incentives will affect the average financial performances of the participating enterprises.*

In contrast to the social performance, which is directly measured by the SPC project office across four distinct dimensions (employment, social service, environment, and community), financial performance indicators are standardized for firms. In this study, we utilize the following financial performance indicators. First, as proposed by Jung and Shin (2022), we adopt the operating margin (calculated as operating income divided by total sales) to measure financial performance. By excluding revenues from nonoperating activities, such as government subsidies, the operating margin allows us to assess how firms enhance their financial sustainability through their core business activities, minimizing reliance on external aid. Second, we examine the year-on-year growth rates of operating income and total sales, considering that the SPC program spans a three-year financial intervention period, necessitating a comprehensive analysis of financial progress over time. Thus,

these three variables serve as our primary outcomes for financial performance. Additionally, we consider cross-sectional total sales, operating income, net income, and the sum of total sales and revenues from nonoperating activities (e.g., government subsidies and donations) as secondary outcomes for financial performance.

Section 4: Estimation

4.1 Balance Test

We conduct mean comparison tests in order to check the balance between the treatment and the control group in terms of review scores, firm characteristics, baseline social performances, and baseline financial performances. The following 22 variables will be included in the balance tests: 1) document review score, 2) interview score, 3) firm age, 4) social enterprise certification status, 5) firm location dummy, 6) baseline social value (total), 7) baseline social value for employment-type, 8) baseline social value for social service-type, 9) baseline social value for environment-type, 10) baseline social value for community-type, 11) sales, 12) cost of sales, 13) operating income, 14) non-operating income, 15) subsidy, 16) net income, 17) assets, 18) current assets, 19) non-current assets, 20) liabilities, 21) current liabilities, 22) non-current liabilities.

4.2 Estimation of Average Treatment Effects

Our main analysis will use the reduced-form estimation of the effect of SPC cash incentives on outcomes of interest in order to test Hypothesis 3.1 and Hypothesis 3.2. First, we will be estimating the following simple model using pooled ordinary least squares:

(1) $Y_{it} = \beta_0 + \beta_1 SPC_i + \delta_t + X_{it} + \varepsilon_{it}$

where Y_{it} is an outcome of interest and SPC_i is the treatment assignment dummy, δ_t is year fixed effects, and X_{it} includes time-varying control variates such as 1) firm age, 2) firm location, 3) firm size (assets), 4) leverage, 5) government subsidy and donation, and 6) social enterprise certification status. ε_{it} is an error term clustered at the firm level. For the outcomes of social performances, we analyze total social value created, employment-type performance, social service-type performance, environment-type performance, and community-type performance, respectively as well as each social outcome per sales$_{it}$. For the outcomes of financial performances, we mainly analyze operating income divided by total sales and the year-on-year growth rates of operating income and total sales. As secondary outcomes for financial performance, we also consider cross-sectional total sales, operating income, net income, and the sum of total sales and revenues from nonoperating activities (e.g., government subsidies and donations).

Second, we will examine whether the SPC cash incentive gradually affects the financial and social performances of the participating firms following their initial entry into the SPC project with the following equation (2) for event-study specification.

(2) $Y_{it} = \beta_0 + \beta_1 SPC_i + \beta_2 Year\_1_i + \beta_3 Year\_2_i + \beta_4 Year\_3_i + \beta_5 SPC_i \times Year\_1_i + \beta_6 SPC_i \times Year\_2_i + \beta_7 SPC_i \times Year\_3_i + \delta_t + X_{it} + \varepsilon_{it}$

where Y_{it} is an outcome of interest and SPC_i is the treatment assignment dummy. Year_1_i ~ Year_3_i are dummy variables for the first, second, and third project year, respectively. The coefficients β_5, β_6, and β_7 from the interaction terms are outcomes of our interest. δ_t is year fixed effects, and X_{it} includes time-varying control variates such as 1) firm age, 2) firm location, 3) firm size (assets), 4) leverage, 5) government subsidy and donation, and 6) social enterprise certification status. ε_{it} is an error term clustered at the firm level.

4.3 Estimation of Heterogeneous Treatment Effects

The estimation of heterogeneous treatment effects will be achieved through an equation that incorporates interactions between treatment status and control variables (or other variables of interest).

References

Bonner, Sarah E., and Geoffrey B. Sprinkle. "The effects of monetary incentives on effort and task performance: theories, evidence, and a framework for research." Accounting, Organizations and Society 27.4-5 (2002): 303-345.

Feltham, Gerald A., and Jim Xie. "Performance measure congruity and diversity in multi-task principal/agent relations." Accounting Review 69.3 (1994): 429-453.

Holmström, Bengt, and Paul Milgrom. "Multitask principal-agent analyses: Incentive contracts, asset ownership, and job design." JL Econ. & Org. 7 (1991): 24.

Jung, Sun-Moon, and Jae Yong Shin. "Social Performance Incentives in Mission-Driven Firms." Management Science (2022).

Milgrom, Paul, and John Roberts. "Complementarities and fit strategy, structure, and organizational change in manufacturing." Journal of Accounting and Economics 19.2-3 (1995): 179-208.

Nikias, Anthony D., Steven Schwartz, and Richard A. Young. "Optimal performance measures with task complementarity." Journal of Management Accounting Research 17.1 (2005): 53-73.

Serafeim, George, Ethan Rouen, and David Freiberg. "SK Group: Social Progress Credits." HBS Case Collection No.120-071 (2020).

Zhang, Li. "Complementarity, task assignment, and incentives." Journal of Management Accounting Research 15.1 (2003): 225-246.