The Influence of Social Impact Bonds on Public–Private Partnership Success: The Case of Higher Education

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Abstract:

Purpose: How can public–private partnerships (PPPs) financed by social impact bonds (SIBs) achieve measurable indicators of social success within a short time? We undertake this research to find simple, reliable indicators of social success resulting from PPPs.

Design/Methodology/Approach: We statistically analyze data from all SIB-financed projects worldwide in the areas of education and training, using a logistic mixed effect model. In addition, we use an alternative approach to analyze the predictors of outcome success within homelessness projects, as they offered the most complete set of information.

Findings: We prove that the vast majority of problems associated with issuing SIBs globally relate to the measurable quantification of positive social impacts.

Practical Implications: We propose a public policy for financing higher education with SIBs where appropriate, wherein countable results are achieved as soon as the cooperation starts and each stakeholder gains.

Originality/Value: Our proposed solution ensures a trade-off between profitability and immediate social effect among all partners.

Keywords: Social impact bonds (SIBs), public–private partnership (PPP), higher education, success circumstances, public policy.

JEL: J58, B4, H5, H0, H54.

Paper Type: Research study.

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1. Introduction

Private operators or public–private partnerships (PPPs) are a popular method of financing public investments. However, in many cases, their potential in public service development is devalued due to the unsatisfactory benefits received by the public payer or because of societies' accessibility limitations. As the traditional infrastructure-based approach to PPP does not appear to have achieved expected levels of efficiency and effectiveness, this study focuses on the degree to which social impact bonds (SIBs) can serve as a benchmark for innovating policy in the PPP model, with strong emphasis on achieving easily quantified results due to generated social value.

In addition, there is a gap in the research literature regarding the lack of quantifiable and easily obtainable SIBs issuance objectives that can be used to determine whether to repay the private investor within the PPP depending on whether those objectives were achieved or not. However, with positive, measurable social effects after the implementation of SIBs, both the public and private sides of PPPs could expect a return on the costs of SIB issuances. By shortening the waiting period for the success of SIB issuances under PPPs, interest in public–private cooperation, including one that is mainly focused on both profit and local social effect, may increase. Therefore, we undertake this research to help scientists and entrepreneurs look for simple, reliable indicators of social success resulting from public financing for PPPs. It should become an ordinary policy that when obtaining public financing for private operators, the PPP's profit is allocated directly to both society and the PPP's owners. Thus, here, we seek to present an incentive for decision-makers to shape such an investment financing policy; that is, one within which a part of the public–private profit is always allocated to specific social goals.

SIBs are relatively new financial instruments designed to reward success that is understood to be ensuring the expected positive social and economic outcomes of an investment project. SIB-financed programs attract private sector entities to pre-finance social interventions for public entities. If the program achieves the objectives agreed upon beforehand, the public entity repays the investor. If the program fails to achieve the agreed upon objectives, the investors suffer the loss.

PPPs financed by SIBs within higher education are targeted at solving the problem of insufficient public finance, enabling potential students to take part in full-time doctoral studies. This may create an opportunity to gain additional sources of financing for students, as well as widen entrepreneurs' social responsibility scope. As they get involved in higher education PPPs, students may realize their desired research goals and society may produce highly educated graduates. Graduates, despite their financial status, may develop desired research within their universities given sufficient financial support for their entire study period and begin cooperation with the potential entrepreneurs.

Herewith, we propose a public policy for financing higher education with SIBs where appropriate, wherein countable results are achieved as soon as the cooperation starts and each stakeholder gains. The requirements for a successful SIB issuance are as follows:

- A private entrepreneur needs to bring an acceptable level of profit.
- The public partner is keen on providing stable public service.
- Society is more than happy with the touchable direct social impact of public–private cooperation.

2. Literature Review

A PPP is a long-term agreement between private and public entities that enables the provision of public services. In this agreement, the private and public partners bear a significant risk, managing and being responsible for the outcome of the partnership (Yescombe, 2007). Often, studies analyze PPP in the context of obtaining "best practices" (Osborne, 1993) without proposing a formal model. Other studies focus on the effectiveness of partnerships resulting from infrastructure construction and management (Engel *et al.,* 2013). This study, however, focused on PPP in the education sector and sought to propose a model for this context. Developing countries, in particular, face the problem of insufficient public funding to finance children and young people's full access to education (Bray, 1999). Additionally, access to higher education is addressed infrequently. Postgraduate education is not an existential problem or a problem of great social importance on a macroeconomic scale.

However, for developed economies, the problem of shaping the level of innovative knowledge may be a key argument in terms of gaining competitive advantage in mature markets. Just as in Silicon Valley, every developed region continues to look for opportunities to gain a competitive edge in the international race for innovation and socio-economic progress. An indispensable element of that kind of progress is knowledge, and advanced knowledge is often associated with higher education. PPP in higher education are relatively well-known solutions used in the organization and management of dormitories and other real estate within universities, among other instances. Research in this area was conducted by Blair and Williams (2017), among other scholars. They report that the trend toward the development of PPP in higher education is intriguing due to apparent changes in student housing objectives and the readiness of large university systems to conclude long-term public–private contracts. It seems that there is already a bridge for the public and private sector to use to engage in joint governance.

To examine the trade-off between profit, public service, and social welfare, we search for factors that determine the formation of "fair societies," especially in the context of growing disparities in the development of individual economies. Social welfare was defined as early as the 1970s in the works of scholars, such as John Rawls and his *A Theory of Justice* book (Nickel, 1994*)*, Amartya Sen's *Collective*

Choice and Social Welfare (Sen, 1970), and Ester Boserup *et al.'s Women's Role in Economic Development* (2013). In this study's proposed solution, a PPP project is financed by SIBs where social welfare means access to graduate-level learning for the most qualified university graduates, regardless of their wealth. Other benefits made explicit by the example project were those stemming from the obligation of doctoral students to stay in the region for a certain period and to share in the tax burden of the region. Increasing innovation in the region, due to the commercialization of scientific research developed at the university in cooperation with a private investor within the framework of the example PPP, would certainly contribute to the consolidation of inclusive social and economic policy.

Rawls (1971) proposes supporting the poorest people working to reach the minimum subsistence level and integrating those people into society so as to maximize the social welfare function. Note that to date, paying for doctoral school (postgraduate education) has not guaranteed participants remuneration at a level that would be close to the national average or a salary comparable to persons with higher education working outside the public sphere. Furthermore, we agree with authors who proved that increasing education expenditure with no additional measures such as reforming the education system and establishing a competitive labor market does little to lower the levels of income inequality (Ning, 2010).

Drawing attention to the need to demonstrate tangible effects of social activities when financing by SIB leads us to the analysis of PPP contracting. SIBs are win–win processes, where each party achieves the expected objectives (Fraser, 2018; Roumboutsos and Saussier, 2014; Warner, 2013). Bevir and Rhodes (2007), as well as Bevir and Richards (2009), indicated that the implementation of this type of bond means moving away from competitive mechanisms of contracting public services and moving toward contracting services on the basis of the declared result instead of the asking price. This is a satisfactory and expected approach for both private and public investors involved in a PPP. In many cases, the contracting of public services within PPPs is based on the parameters of the impact of the activity. The price of services, the value of the investment, and/or the execution and management of the created infrastructure do not solely determine the choice of a particular concessionaire/partner in a PPP. Achieving value for money and the indication of a measurable social impact are often the key criteria in competitive dialogue-based proceedings (Petersen, 2019).

However, determining the measurable impact of a PPP can be difficult. The implementation of a financing formula that used SIBs and that could define quantifiable and measurable social impact factors would simplify the process of selecting a private partner in a competitive dialogue. We agree with Hevenstone and von Bergen (2020) that SIBs might promote government transparency due to outcome data collection and evaluation, which are part of the contractual terms. We disagree that SIBs might complicate public partner transparency because more contractual parties might lead to more uncertain data ownership as the maximum

profit aim transforms information into a competitive advantage. The long-term cooperation within PPPs guarantees the position of a quasi-monopoly (Moszoro, 2018). Therefore, it extends this form of collaboration beyond the scope of competitiveness.

Similar analyses of the significance of measurable SIB effects are conducted by Fox and Morris (2019), Carter (2019), and others. These authors describe the evaluations of projects using SIBs, especially the achievement of measurable social results that guarantee the financing of the cost of bond redemption that was assumed by a public entity. However, these scholars also point out the drawbacks associated with the measurement of social impact and the difficulty of forming conclusions about SIB success factors. These obstacles underscore the need to develop a standard for measuring the expected results of issuing SIBs for public investments.

Some papers within this field underline the strong need for independent evaluations of SIB outcomes and impacts (Jackson, 2013). We agree with this and the need for fast and direct outcomes symptoms as soon as the project starts. Private investors want to obtain profitability within a shorter time period than is required for SIBs to be repaid; thus, long wait periods are inefficient to realize the social benefits of their investment. Furthermore, according to Dixon (2020) there is a great need to establish a predefined set of results that take into account the specific expectations of partners, especially those related to obtaining reimbursement of financing costs by SIBs.

The context of SIBs in the education sector has rarely been addressed in extant literature. According to Joynes (2019), the author of a report on SIBs in the education sector, the key factor determining the organizational and financial success of SIBs in this sector is the precise definition of the expected social impact that must be achieved. Based on the parameters of all 14 educational project issues from the Global Social Impact Bond Database, more than 300,000 people worldwide were the beneficiaries of these programs (for the total number of SIB issues in the education sector, refer to Table 2). The most common parameter for the assessment of social impact in these projects was ensuring access to education for children who were previously excluded from the system. Unfortunately, an insignificant number of measurably confirmed impacts prevented us from carrying out further statistical analyses on 14 education projects.

A study by Tse and Warner (2020) is particularly interesting and relevant to the goals of this study. They state that the organization of SIBs issued on a small scale had low-impact contributions and sometimes even limited social rights and access to services for others. We argue against these results, conducting our own analysis to prove the possibility of achieving an optimal size for a group of beneficiaries. The achievement of the assumed goal guarantees the success of the issuance. Unfortunately, we can only prove this in the case of the phenomenon of homelessness, rather than education. This limitation underscores the importance of quantifiable types of planned social impacts in assessing success from issuing SIBs.

For example, the percentage of the program participants who complete the education stage financed with SIBs could be the measure, as opposed to the general or simple number of people joining the program. We agree with Tse and Warner that to determine the success of placing SIBs in the education system, "common sense" in determining the expected results and impacts is necessary. These determinations must be consistent with the characteristics of a specific area of science or education. Moreover, to ensure a reliable assessment of social impact, it is necessary to have solid indicators of success in a properly selected period of "social" return on investment, as we present below.

3. Methodology and Results

The subject of this study includes all SIB-financed projects in the areas of education and training worldwide, selected from a database of 187 projects (golab.bsg.ox.ac.uk). The data from all SIB-financed projects worldwide undergo the linear mixed model analysis. Numerical variables were characterized by the following descriptive statistics: minimum (min), maximum (max), 1st quartile (Q1), median (med.), mean, and 3rd quartile (Q3). Due to the nature of analyzed data (multiple outcomes possible within projects), regression analysis of repeated measures necessitates the use of logistic mixed effect models. An outcome success is modeled in this way with outcome target description, capital raised, and cohort size as fixed effects, and project as a random variable. To accommodate for the widely different scales of each predictor, these variables are normalized so that both mean and standard deviation of each variable was equal to one. Univariate logistic mixed regression is used to settle the hypotheses.

To determine whether the explanatory variables in a model are significant, we use Wald's test, which can be employed for a multitude of different models, including those with binary or continuous variables. Wald's test is used both for all model parameters (coefficients) and for each of them individually. In the first case, Wald's test is used to test the null hypothesis that the set of model coefficients is equal to zero. In the second use case, a statistically significant result of Wald's test for a given coefficient of the model means that it is significantly different from zero, and thus a relationship is detected between the predictor, which corresponds to this coefficient and the dependent variable.

The result of Wald's test for individual coefficients is placed in the tables with fixed effects of mixed models (shown in the "p-value" column). The Wald's test result for the entire set of parameters is depicted in a separate table.

Just over one-fifth of the 187 projects had been completed at the time of our analysis. Among the completed projects, the majority had missing data that made it impossible to analyze the project. Each project may have had several outcomes; however, for the purpose of further analysis, outcomes were analyzed as individual observations. Therefore, the success of each full project is not analyzed, only

individual outcomes were analyzed. There were 349 different outcomes from all completed projects. The criterion for success of the outcome is if the outcome target achieved was equal to or greater than the outcome targeted. Table 1 presents the details of the completed projects that provided data for our study.

Table 1. *Extant completed projects analyzed*

Policy Area	Number of Projects	Number of Outcomes	Outcome Result: Success	Outcome Result: Failure	Outcome Result: No Data
Agriculture and environment	2	4	2	2	
Child and family welfare	32	6			6
Criminal justice	15	3	1		2
Education and early years	26	5			5
Employment and training	50	154	2		152
Health and wellbeing	31	2			2
Homelessness	30	175	74	76	25
Poverty reduction	2	0			
Overall	188	349	79	78	192

Source: Own study.

The dataset contains information about 187 projects from eight policy areas. The projects focus primarily on the following policy areas: employment and training (27%), child and family welfare (17%), health and wellbeing (16%), and homelessness (16%). An overview of capital raised for projects is presented in Table 2. Criminal justice projects operated with the highest amount of financial support, followed by child and family welfare projects.

Table 2. *Capital raised (in £ million)*

Policy Area	Min.	Q1	Median	Mean	Q3	Max.	SD	Total
Agriculture and environment	0.08	0.7	1.3	1.3	1.9	2.5	1.7	2.6
Child and family welfare	0	0.5	1.6	2.8	3.9	13.4	3.3	63.5
Criminal justice	0	1.5	4.8	5.3	7.5	13.7	4.5	74.6
Education and early years	0	0.2	0.42	1.3	0.8	13	2.8	30
Employment and training	0	0.36	0.73	2.2	1.5	33	5.5	88
Health and wellbeing	0.04	0.44	1	1.9	1.7	15	3.2	41
Homelessness	0.1	0.45	1	1.7	1.9	6.7	1.8	38
Poverty reduction	1.8	1.8	1.8	1.8	1.8	1.8	NA	1.8
For all policy areas	0	0.35	0.9	2.3	2.5	33	4	340

Source: Own study.

Due to the lack of data, tests are not carried out for individual industries; policy areas were considered collectively instead. Pearson's correlation testing do not show that the number of users involved with the project or the capital raised for the project was related to project success. Likewise, a Fisher's exact test finds no link between

the intermediary advisor and the success of the project. The test also fails to show a link between the project's success and the SIB structure. Table 3 displays the results of this testing.

Table 3. *Overview of statistical hypotheses*

Hypothesis	Test	p-value
The number of project users is correlated with a positive outcome result.	Pearson correlation test	>0.05
Intermediary advisor influences outcome success.	Fisher's exact test	>0.05
SIB structure influences outcome success.	Fisher's exact test	>0.05
Capital raised is related to outcome success.	Pearson correlation test	>0.05

Source: *Own study.*

To validate the hypotheses, univariate logistic regression models are created, taking into account the random factor—the project number. For the multi-factor model of the mixed logistics model, the model coefficients thereof are shown in Table 4 below.

Table 4. *Predictors of outcome success*

	Odds ratio	2.5% CI*	97.5% CI	p-value
Outcome target description	2.714	1.699	4.594	<0.001
Capital raised	5.21	1.107	26.958	0.042
Cohort size	0.001	0	0.518	0.036

Source: *Own study.*

Hypothesis 1: The number of project users is correlated with a positive outcome result.

Based on the mixed logistic regression model, there is no basis for the hypothesis that the number of project users is correlated with a positive outcome result (p>0.05).

Table 5. *The number of project users is correlated with a positive outcome result. Mixed model results - only for homelessness (not enough data for the rest)*

	Estimate	Std. Error	z value	2.5 %	97.5 %	P-value
(Intercept)	-0.027	0.163	-0.163	-0.348	0.294	**0.870**
cohort_size	-0.059	0.164	-0.360	-0.382	0.263	**0.719**

Source: *Own study.*

Hypothesis 2: Intermediary advisor influences outcome success.

Based on the mixed logistic regression model, there is no basis for the hypothesis that the intermediary advisor influences outcome success (p>0.05).

Hypothesis 3: SIB structure influences outcome success.

Based on the mixed logistic regression model, there is no basis for the hypothesis that the SIB structure influences outcome success (p>0.05).

Table 6. *Mixed model explaining outcome success by intermediary advisor*

	Estimate	Std. Error	z value	2.5 %	97.5 %	P-value
(Intercept)	**0.000**	**0.333**	**0.000**	**-0.659**	**0.659**	**1.000**
intermediary_advisor Social Finance	**0.177**	**0.413**	**0.429**	**-0.634**	**0.990**	**0.668**
intermediary_advisor Triodos Bank UK	**-0.251**	**0.442**	**-0.568**	**-1.125**	**0.616**	**0.570**

Source: *Own study.*

Table 7. *Mixed model explaining outcome success by SIB structure*

	Estimate	Std. Error	z value	2.5 %	97.5 %	P-value
(Intercept)	**-0.405**	**0.373**	**-1.088**	**-1.162**	**0.315**	**0.277**
sib_structureIntermediated	**0.560**	**0.670**	**0.836**	**-0.754**	**1.906**	**0.403**
sib_structureManaged	**0.497**	**0.419**	**1.186**	**-0.316**	**1.339**	**0.235**

Source: *Own study.*

Hypothesis 4: Capital raised is related to outcome success.

Based on the mixed logistic regression model, there is no basis for the hypothesis that the capital raised is related to outcome success (p>0.05).

Table 8. *Mixed model explaining outcome success by capital raised*

	Estimate	Std. Error	z value	2.5 %	97.5 %	P-value
(Intercept)	**0.014**	**0.160**	**0.086**	**-0.300**	**0.328**	**0.931**
capital_raised	**0.141**	**0.178**	**0.792**	**-0.185**	**0.543**	**0.429**

Source: *Own study.*

In addition to univariate statistics, an alternative approach is used in the analysis of the predictors of outcome success. For this analysis, only projects from the area of homelessness are analyzed as they contained the most complete set of information. While homelessness is not thematically consistent with the education sphere, it demonstrates similar methodological problems related to social impact assessment in terms of issuing SIBs and obtaining tangible social benefits.

A logistic mixed effect model of outcome success is prepared with outcome target description, capital raised, and cohort size as fixed effects, and project as a random variable. To accommodate the widely different scales of each predictor, they are normalized so that mean of each variable was equal to one and standard deviation was also equal to one.

The results indicate that each of the fixed effects is indeed a significant predictor of project success. The largest positive effect comes from capital raised. When

comparing two projects that are equal in all predictor variables except capital raised, a one standard deviation increase above the mean of capital raised (i.e., a rise from £1.7m to £3.5m) increases the chances of success by factor of 5.21. While outcome target description has a less pronounced influence, cohort size acts as a very strong predictor of failure: the value of the 97.5% confidence interval indicates that an increase in cohort size of one standard deviation above the mean decreases chances of success by a factor of nearly two (1/0.518).

Table 9. *Predictors of outcome success. Estimated coefficients of the fixed effects of multifactorial mixed model explaining outcome success*

	Estimate	2.5% CI	97.5% CI	P-value
Intercept	-3.66	-7.44	-0.11	0.049
Outcome target description (scaled)	0.999	0.53	1.52	<0.001
Capital raised (scaled)	1.651	0.10	3.29	0.042
Cohort	-7.377	-14.55	-0.66	0.036

Source: *Own study.*

Table 10. *Predictors of outcome success. Fixed effects of multifactorial mixed model explaining outcome success – odds ratios calculated on the basis of the model coefficients*

	Odds ratio	2.5% CI	97.5% CI	P-value
Outcome target description	2.714	1.699	4.594	<0.001
Capital raised	5.21	1.107	26.958	0.042
Cohort size	0.001	0	0.518	0.036

Source: *Own study.*

Table 11. *Wald's test results (for the set of model coefficients described in Table 9)*]

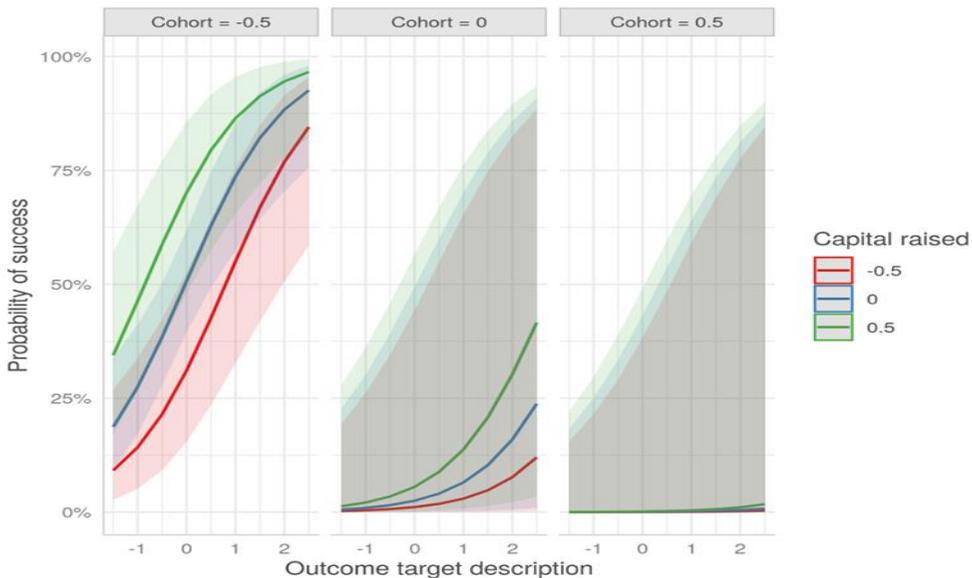| X^2	df	P-value
16.3	3	<0.001

Source: *Own study.*

Figure 1 displays the interdependency of the analyzed predictors visualized in a graphical form. As the figure demonstrates, the chances of success decrease very rapidly with increasing cohort size.

Summing up, due to the lack of data, analysis is somewhat limited. None of the statistical tests show correlations between outcome success and various individual factors. However, when we compare cohort size and capital raised simultaneously with the project's success, interesting relationships emerge. Not much can be said about the overall success of the projects, with the success of around 80% of them still unassigned. This study's proposed PPP organizational solution would guarantee transparency in the process of assessing measurable social effects during the lifetime of the PPP project. A financial agreement structure for SIB-financed PPP projects

would enable broader yearly benchmarking of SIB emissions globally, offering a measurable SIB success rate.

Figure 1. *How raised capital and cohort size relate to outcome success*
Source: Own compilation. All calculations were performed in the R program (ver. 4.0.2)

Source: *Own study.*

4. Discussion

Interpreting the results obtained through analysis, we attempted to establish an organizational solution in which the defects of the existing SIB issuance processes could be avoided. The difficulty in this task, raised by many researchers and confirmed in this study, was that there was no way to quickly quantify the positive impact to the public and the private sides of the investment financed by SIBs. While the proposed organization and structure of the SIB issue by a public university is based, in this particular case, on running a public–private doctoral school, that does not mean that the same scheme cannot be applied in another sector of public–private cooperation that could be financed by SIBs.

The organization begins with the establishment of a public–private company in which shares are held by a private investor, a public higher education institution, and a local government unit. The aim of the established entity is to develop and conduct scientific research within the doctoral school. Private-partner involvement is meant to increase the possibility of commercializing research and employing graduates in research and business positions in private companies in the region.
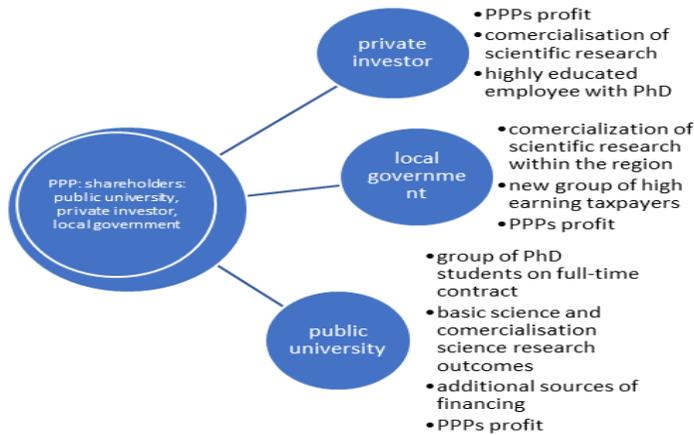
The inclusion and presence of a local government unit offer an opportunity to translate the results of research work, as well as the scientific and professional activity of doctoral students, into broadly understood local social welfare efforts. This transformation can be accomplished by not only implementing the results of research work within the region but also retaining the doctoral school graduates in the region, where they become taxpayers.

A popular argument is that more funding is needed to increase the effectiveness of research conducted by universities. Again, this objective can be fulfilled by issuing SIBs that supplement the public research-funding system. The choice to employ the SIB instrument is made to achieve positive financial flow that results from the implementation of a financed investment. Therefore, it is possible to imagine that SIBs can finance public–private prisons, schools, kindergartens, water supply companies, and other projects, but only if achieving positive financial results is a possibility. Note that the expected profitability of a project financed by SIBs is an additional powerful equivalent response and incentive for the capital provider questioning the positive social impact of the project.

The positive social impact for a public–private prison partnership could be a reduction in recidivism levels within a certain number of years following release. For a school, success could be determined by financing scholarships for talented students from disadvantaged families, by purchasing educational materials, or by increasing access to education for children previously excluded from the system, among other potential measures. In this study's example of a doctoral school, a crucial element would be providing scholarships for doctoral students to allow the students to engage in scientific activities full-time. Until now, positive solutions like this one have not existed. In fact, financing options that allow students to attend doctoral schools are so unsatisfactory that the students are forced to undertake work outside the university.

Within the university, conducting research is considered an additional activity, often a short-term activity due to the low salaries offered to doctoral students. It is even more difficult for universities to onboard private enterprises as research sponsors. PPPs financed with SIBs have never been a standard for the development of research, especially in Central and Eastern European countries and in areas of science where it is difficult to commercialize research outcomes and results. The problems are not only due to legal systems that solely enable public funding of science and research, but also due to the essence of research activities, not all of which have to be commercially viable.

The solution suggested by our study, financing a doctoral school by SIBs, guarantees positive, measurable effects for each of the partners in the PPP. Figure 2 displays the potential positive effects obtained from financing a PPP through SIBs in the doctoral school environment.

Figure 2. *Positive effects from SIB-financed PPP*

As with any commercial company, each partner in a PPP has the right to obtain dividends. An additional benefit for a private investor would be the opportunity to commercialize research and increase the investor's own innovation. When graduates of a doctoral school are obliged to stay in the region for a certain period after obtaining their degrees, a local government unit partner gains taxpayers and the prestige associated with a region that cares about the levels of access to education and education quality. The university partner enjoys increased levels of research funding and the ability to differentiate funding sources.

As proved within the literature review, the vast majority of problems associated with issuing SIBs globally relate to the measurable quantification of the positive social impacts that result from that issuance. In this study, we suggest that the success of the PPP should be measured by the number of doctoral school graduates. Assuming that 3–5 years of full-time study are necessary to obtain the doctoral degree, the first positive social impact would be anticipated for the project's sixth year; that is, when the first program graduates would start working and become local taxpayers.

Other potential success indicators to be considered are the value of commercialized research results carried out by the students and the number of university graduates employed by the private investor within the PPP. What is most important is determining a quantifiable and measurable indicator; if or when that indicator is achieved, the cost of the financing obtained from the private business investor would be covered by the local government unit of that PPP. It significantly limits the time to archive the success and apply for SIB issuance cost repayment. As the SIB issuance payback period (financial success) might be set within 12–15 years, the measurable social effects (number of doctorate degrees obtained) might be realized far quicker (within 6 years).

This study also investigated and objectively assessed the costs of organizing a PPP project financed with SIBs, in which the partners arrive at a compromise between profit and positive social impact. For the local government unit, the burden of achieving the expected social impacts will be covering the cost of SIB financing. The public university will face the burden associated with spinning off a part of its activities to establish a commercial company. These burdens may include lower levels of public subsidies, due to the commercialization of the university's activities. The private investor will have to account for the lower profitability of educational services; thus, the possibility of a satisfactory positive financial result arises, not only from the ongoing operation of the doctoral school but also from the commercialization of the research results.

5. Conclusions and Further Research Implications

The use of SIBs as an instrument in PPP makes finding a compromise possible in terms of both maximizing an investor company's value and ensuring social welfare. The business objective of maximizing profits does not have to be abandoned or conflated to be a purely philanthropic activity. To maintain their market positions by cooperating with the public payer (quasi-public monopoly, where the private investor cooperates with the public payer to deliver social/public services/products), profit-oriented entities may be interested in distributing their profits, making a direct impact on public-service satisfaction levels among their "customers" and being rewarded for their success by the public payer. The proposed PPP model that uses the SIB instrument is an example of a win–win–win project.

The results of our statistical analyses confirm that the larger the group of potential participants, the lower the chances of project success. The statistical analysis only yielded this result when we moved from testing individual factors to combining cohort size and capital raised, and simultaneously comparing that data with project success.

We acknowledge the shortcomings or limitations of this study. The first is a methodological limitation; there have been only a small number of SIB-financed projects completed and, of course, a small number of associated public evaluation reports. The second limitation results from us comparing social impacts over a short timeframe, up to 5 years after project completion. An evaluation that fully illustrates social change may require a longer period and the comparison of identical public services. In addition, individual public services may not translate rapidly into measurable overall welfare or measurable social impact. The development of financial instruments, such as SIBs, however, requires a skillful demonstration of positive social impact in the short term. Achieving this impact is a prerequisite for the public entity involved in the project that applies for financing-cost coverage (costs that may include interest, the issue process, and/or the full redemption cost). Third, in our study's example, the process of financing PPP by SIBs focused on

educational services only; other industries were not covered due to methodological limitations.

It is worth noting that the strong development of SIBs and PPP may lead to permanent changes in attitudes about achieving positive social impact in all public services. However, some positive social impacts are not tangible, although they do translate to higher Human Development Index results. For example, the social benefit from defense (military) projects is not likely to be of interest to private investors, due to low profitability.

The most important contribution of this study is the presentation of the possibility of change; it is possible to depart from the canon of governance, based solely on maximizing company value or profit. We dispute the claim that a changed and multi-faceted objective is overarching for private stakeholders, emphasizing that it is possible to achieve a compromise between profitability and an investment's positive social impact within the framework of a PPP. While this idea may not be popular, it belongs with current heterodox economic theories that increasingly overturn the foundations of capitalism, that is, maximizing the value of a project in favor of a philanthropic face. The success of SIB-financed PPPs is based on a compromise between public and private partners, in which every stakeholder sacrifices some expectations to achieve social and business goals simultaneously.

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