

# Social Impact Bonds and Institutional Investors: An Empirical Analysis of a Complicated Relationship

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## Abstract

Over the past 8 years, social impact bonds (SIBs) have attracted increasing attention from scholars, policy makers, and investors. Notwithstanding good intentions and policy makers' enthusiasm, SIBs have failed to attract significant private capital. Considering the SIBs issued worldwide until December 2017, we look for the critical success factors of SIB funding by investigating both the financial and contractual characteristics of SIB contracts. We find that institutional investors are more likely to participate in an SIB funding when there are fewer agency problems.

## Keywords

social impact bonds, NPOs, institutional investors, impact investing

## Introduction

Although nonprofit organizations (NPOs) have recently been called upon to provide an increasingly wide range of services, the resources available for them to do so tend to decrease during the crisis periods when they are needed the most (Dodd & Moody, 2011; Joy & Shields, 2013). The relevant literature typically recognizes three main sources of funding for NPOs: funding from nonlending institutions, internal funding, and funding from capital markets (Bowman, Tuckman, & Young, 2012). Nonlending institutions, such as private donors, other nonprofits, governments, foundations, and corporations, are the main source of funding. These organizations usually support only

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short-/medium-term projects and require funders' active participation in the definition of the social mission. In recent years, donors have significantly increased their involvement in the wake of the New Public Management's emphasis on markets and performance management within the public sector (Ostrander, 2007). Donations and endowments, however, have an intrinsic component of volatility as they depend on the economic cycle and how it affects high net worth individuals' expected permanent incomes (Hughes & Luksetich, 2008).

The accumulation of unrestricted net assets represents both the main source of NPOs' internal funding and the only typology of funding controllable by their decision makers (Calabrese, 2012).

The third source of funding—the capital market—is reduced to borrowing, often in the form of tax-exempt bonds. This funding form, however, has been undergoing a process of in-depth revision; in the United States, for instance, there are plans to replace tax exemptions with tax credits or to eliminate tax-exempt bonds (e.g., municipal bonds) to reduce the federal deficit (Calabrese & Ely, 2016). The counterparts NPOs can rely on to raise financial resources tend to be particularly concentrated, making it problematic for them to diversify their sources of funding. It is well recognized in the literature that NPOs should not only have a more flexible relationship with both the public and private sectors (Abzug & Webb, 1999; Young, 2000) but also access to more conspicuous, diversified, and stable funding solutions (GECES, 2016; Hughes & Luksetich, 2008; Mayer, Wang, Egginton, & Flint, 2014). During the past decade, an innovative form of funding of social programs has been introduced within the financial markets: the social impact bond (SIB),<sup>1</sup> which was welcomed as the definitive answer for NPOs' unaddressed financing issues, but so far failed to become NPOs' reference source of funding (Demel, 2012; Warner, 2013). SIBs are an innovative way to finance social programs, introducing a new form of public–private partnership (PPP) to provide social services (Jackson, 2013; Liang, Mansberger, & Spieler, 2014; Nicholls, 2013; Stoesz, 2014). SIBs blend philanthropy, social projects, and venture capitalism into a complex financial product that seeks to bridge the gap between public need for resources and private financial surplus. The question of whether an SIB is primarily a financial instrument or a public service contract has been extensively discussed (Clifford, 2016). According to Fraser, Tan, Lagarde, and Mays (2016), we can distinguish among three different narratives on SIBs: the public-sector reform narrative, the financial-sector reform narrative, and the cautionary (primarily academic) narrative. The first two are complementary and offer a positive view of SIBs. From the public-sector point of view, SIBs could help align public and private interests while improving the target population's social conditions. SIBs have been implemented in numerous countries (e.g., Australia, Belgium, Canada, Finland, Germany, India, Ireland, Israel, the Netherlands, Peru, Portugal, Switzerland, South Korea, the United Kingdom, and the United States) and seem to be a valid innovation for financing social services (Butler, Bloom, & Rudd, 2013). The financial sector, after years of excessive speculation, is attempting to connect investors' financial needs to the positive impact of their investments (Zingales, 2015). Pursuant to one sustainable finance strategy, a growing number of investment banks (e.g., Goldman Sachs and

JPMorgan Chase) have established ad hoc branches that address social finance and impact investing. Despite the potentiality of the SIBs, their limited adoption rate leads the advocates of the cautionary narrative to think that some further analysis is necessary to understand the possible reasons that hinder the widespread use of SIBs. Some authors, for instance, highlight the risk of the “financialization” of public services with the consequent subordination of public needs to financial interests (Lake, 2015) and the risk of a perverse incentive for NPOs and social enterprises toward commercial interests (Mullins, Rees, & Meek, 2011; Sinclair, McHugh, Donaldson, Roy, & Huckfield, 2014).

As a matter of fact, despite the growing interest of both researchers and policy makers, the adoption rate of SIBs is modest; from the launch of the first pilot SIB in United Kingdom (Peterborough, HMP Social Impact Bond) in 2010 to the end of 2017, only 107 SIBs have been implemented worldwide (Instiglio; Social Finance). In general, impact investing represents the least developed strategy in the broader social and responsible investing context (Eurosif, 2016). Globally, there are now US\$22.89 trillion of assets being professionally managed under social and responsible investment strategies, and less than 1% is related to impact investing strategies. SIBs have the potential to bring new capital and to increase the efficiency in the supply of social services, but according to the current design, the allocation of risk is so unbalanced toward investors that it may undermine the entire mechanism at its roots.

According to several authors, the diffusion of SIBs could only be guaranteed by their ability to attract institutional investors (e.g., Bafford, 2012; Fraser et al., 2016), namely, players, whose main objective is to professionally manage funds and savings (i.e., banks, insurance companies, mutual funds, pension funds). Institutional investors could provide significant amounts of capital, and as they professionally manage risks for a return, the projects’ risk would not represent a hurdle per se. Furthermore, as SIBs’ returns are not correlated with traditional financial assets, they could represent a form of diversification and finally help institutional investors improve their public image (Barajas et al., 2014).

Nevertheless, the participation of institutional investors in SIB issuances is still a marginal phenomenon. In a departure from the majority of studies (e.g., Lehner & Brandstetter, 2014; Organisation for Economic Co-operation and Development [OECD], 2016; Prentice, 2016; Wilson, 2014), we hypothesize that SIBs’ contractual design plays a dominant role in determining institutional investors’ participation while recognizing the importance attributed to financial features. Institutional investors may be primarily discouraged to invest in SIBs because these contracts do not provide them with the necessary risk-management tools to select projects and to monitor the service providers’ activities. To test our hypotheses, we collect information about both the financial and the contractual features of the SIBs implemented until the end of 2017, as these characteristics are crucial in complex public–private collaborations (Quélin, Kivleniece, & Lazzarini, 2017). Furthermore, we match this information with the typologies of participating investors, building a unique database. Finally, we perform an empirical analysis to identify the SIB structures that most attract institutional

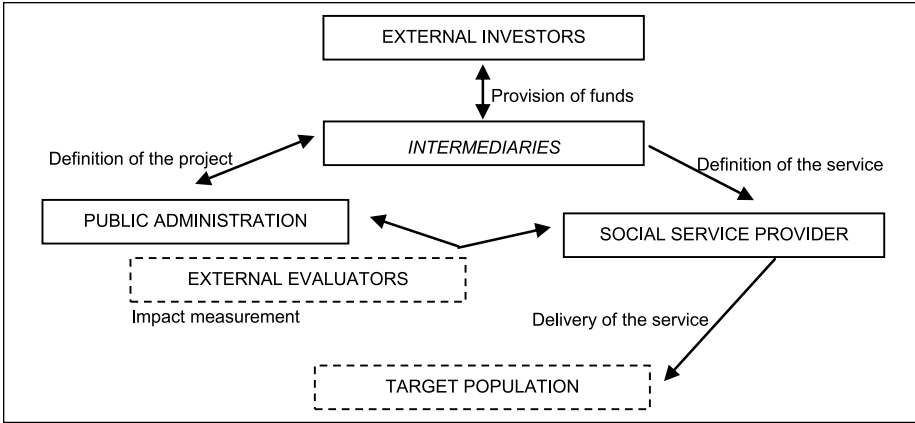
investors. The analysis of our data set suggests that an SIB's contractual structure that mitigates the agency problems inherent in such contracts plays a major role in attracting institutional investors: The presence of a local authority addressing the social issue increases both the chance and the scope of institutional investors' participation, as expected from previous studies on the benefits of local public administration (PA) participation in service innovations (Torugsa & Arundel, 2017); the presence of a special purpose vehicle (SPV) is a positive factor as well, because this structure is generally perceived as a risk-mitigating factor in PPP (Rufin & Rivera-Santos, 2010). Finally, in line with both the visibility (Barajas et al., 2014) and the agency motivations, we find that institutional investors prefer projects with fewer investors. Furthermore, the analysis shows that institutional investors avoid financing social projects via grants or donations, confirming the fact that the drivers of their participation in an SIB issuance are backed by a financial rationale.

This article contributes to the existing literature in several ways. First, we build a unique database that includes all the SIBs implemented until the end of 2017 with a minimum financial disclosure. Drawing on this data set, we furthermore provide a possible solution to the structural lack of financial resources affecting social investing by providing empirical evidence of the main SIB characteristics that encourage institutional investor participation. The article proceeds as follows. We outline the structure of a prototypical SIB, we present the data and the variables used in the analysis, and then, we describe the models and the research findings. We finally provide some concluding remarks.

## **Social Impact Bonds: Structure, Players, and Nature of the Contract**

Despite their name, SIBs are not exactly bonds but future contracts on social outcomes and can be funded by debt, equity, or donations (Humphries, 2013; Joy & Shields, 2013). SIBs are the financial response to the New Public Management's emphasis on outcome-based contracts in the public sector and an evolution of PPPs. SIBs can be stylized as a principal–multiagent relationship that involves at least four parties (Cabinet Office, 2015; Fraser et al., 2016; see Figure 1): a PA, a service provider, external investors (EI), and specialized intermediaries (INT). Two further actors, represented in the dotted boxes in Figure 1, are required for an SIB to be fully implemented: the external evaluators and the final beneficiaries.

The PA usually structures the project and sets the area(s) of intervention, the beneficiaries, the expected outcome, and the timeframe. In most cases, governmental interventions are aimed at solving social issues, whereas SIBs are designed to potentially prevent them. The success of preventive interventions funded by an SIB reduces future public expenditures and generates savings; the saved financial resources are then partially used to refund and compensate private investors. The primary areas of interventions funded by an SIB issuance have been workforce development, in particular youth offender rehabilitation, health, homelessness, domestic abuse, poor education, and



**Figure 1.** SIBs' stylized structure.  
 Note. SIBs = social impact bonds.

recidivism (socialfinance.org). The second nonfinancial actor is the *social service provider*, typically social enterprises or NPOs that receive the funds collected from the investors and use them as working capital to cover the operating costs necessary to deliver the social service. Depending on the SIB's structure, service providers may also act as investors.

Both PAs and NPOs are particularly risk-averse, and the embedded riskiness of social impact investments typically may lead to adverse selection and cherry picking or discourages these actors from undertaking such projects (Dagher, 2013). In this context, *intermediaries* play a key role, as they transform and reallocate the project's risk in return for remuneration. Within the SIB mechanism, the intermediary organizes the SIB's issuance, designs the features of the financial instruments, and, sometimes, establishes an SPV<sup>2</sup> and manages the financial flows to and from the service providers and the external evaluators. *EI* provide capital by purchasing the financial instruments issued by the intermediary; Arena, Bengo, Calderini, and Chiodo (2016) distinguish between philanthropic investors and traditional investors. The former are driven by social motivations, whereas the latter are primarily motivated by the investment's expected return. Primary importance is given to *external evaluators* who have the crucial role of assessing the feasibility of the social mission and transforming the multiplicity of the government's goals into quantitative, objective indicators to which the investors' repayment is subordinated.<sup>3</sup> Investors' repayment is triggered by the attainment of agreed outcomes, and the return is linked to either the achievement of the goal or to different outcome levels. Therefore, the SIB scheme needs to link unambiguous, quantitative metrics to the expected outcomes to ensure that the payments are earned in a manner that is both valid and attributable (Cox, 2011; Leventhal, 2012; Nicholls, 2013). This rigidity, however, might privilege those SIBs whose pay-for-success structure is easily measurable over more complex, interactive ones or incentivize cream

skimming and cherry picking, regardless of the social urgency of the project (OECD, 2016). Finally, the final beneficiaries (*target population*) involve quite heterogeneous target groups in terms of their size and the typology of the social issues involved; for instance, the NYC ABLE project for incarcerated youth focuses on approximately 10,000 adolescents, whereas Sweet Dreams SIB in Canada targets only 22 vulnerable mothers.

Apart from the principal actors mentioned above, additional stakeholders may participate in the SIB mechanism, including guarantors, legal advisors, subordinate investors, and social rating agencies (Beisland & Mersland, 2012). As clearly emerges from the scheme mentioned above, SIBs are relatively complex instruments that involve multiple stakeholders whose incentives are potentially difficult to align.

## Data Set and Method

This article's purpose is to investigate the main factors that incentivize institutional investors to finance an SIB scheme. Thus, we need to (a) identify the SIBs that have been issued until the end of 2017, (b) collect both contractual and financial data, and (c) analyze those data.

The first step is the identification of the SIBs that have been issued. As a starting point, we use Social Finance UK, Instiglio, and Nonprofit Finance Fund platforms. Social Finance is a well-known nonprofit organization, funded in 2007, that works with governments, social sectors, and the financial community. Its website<sup>4</sup> contains information about the SIBs issued worldwide and the main contractual characteristics of each program. Instiglio is a social enterprise dedicated to creating SIBs and results-based financing programs. Instiglio provides a detailed section on each program's most significant financial information.<sup>5</sup> Nonprofit Finance Fund is a prominent social-sector lender, which provides a detailed activity map<sup>6</sup> of the pay for success projects active in the United States. By merging the information from these data sources, we identify the SIBs that have been issued from the launch of the first one in 2010 to the end of 2017.

The second step involves the collection of the main contractual and financial variables. In addition to the information on the databases mentioned above, when available, we also checked the website of each SIB project in our sample to complete the data collection (see Table 1 for the full list of the SIBs analyzed). To have access to the information we need (e.g., the number and typology of investors), we focus our analysis on SIBs that are either complete or in the implementation stage<sup>7</sup>; we also remove from the sample the SIBs for which institutional investor participation is not allowed and those that do not disclose the basic financial information we need to run our estimates. Despite the fragmented information publicly available, we managed to retain 67 SIBs out of a total of 107, as reported in Table 1.

The third step is the data analysis. We perform a prodromal descriptive analysis and then empirically test our research hypotheses using tobit and ordered probit models on the full sample. Finally, we run some robustness checks (see Table A2).

**Table 1.** Implemented SIBs.

ID	Country	SIB	Year	Location	Maturity	Amount
4	AUS	Benevolent Society Social Benefit Bond	2013	New South Wales	5	€3.32 €14.60
27	AUS	Newpin Social Benefit Bond (SBB)	2014	New South Wales	7	€9.30
61	AUS	Queensland Reoffending	2017	Queensland	7	€3.91
62	AUS	Resolve Social Benefit Bond	2017	New South Wales	8	€4.54
10	AUT	Economic and social empowerment for women affected by violence	2015	Central	3	€ 0.87
9	BEL	Duo for a Job	2014	Brussels	2	€0.49
39	CAN	Sweet Dreams Supported Living Project	2014	Saskatchewan	5	€0.80
50	CAN	Essential skills	2016	British Columbia, Ontario, Saskatchewan	5	€0.45
51	CAN	Mother Teresa Middle School	2016	Saskatchewan	5	€0.66
16	CHE	Fokus Bern	2015	Bern	5	€2.80
12	DEU	Eleven Augsburg	2013	Augsburg	2	€0.27
1	GBR	3SC Capitalise	2012	Cardiff, Newport	3	€0.14 €0.47
2	GBR	Advance Programme	2012	West Midlands	3	€4.38
13	GBR	Energise innovation	2012	Thames Valley (South West England)	3	€1.31
15	GBR	Essex Family Therapy	2013	Essex County	3	€4.53
17	GBR	Fusion Housing	2014	Kirklees, Calderdale, and Wakefield	3	€0.27 €1.10
18	GBR	Fusion Housing	2014	North West England	3	€0.22
19	GBR	Home Group	2014	Newcastle, Northumberland, Tyneside, Gateshead, Durham, and Sunderland	3	€0.15 €0.58
21	GBR	It's All About Me	2013	Country-wide	3	€2.92
24	GBR	Links4Life	2012	Stratford, Canning Town, Royal Docks (Newham), and Cathall (Waltham Forest)	3	€0.54
25	GBR	Living Balance	2012	Perthshire and Kinross, Scotland	5	€0.73
26	GBR	Local Solutions	2014	Liverpool and Knowsley	3	€0.03 €0.12
28	GBR	Nottingham Futures	2012	Nottingham City	3	€2.48

(continued)

**Table 1. (continued)**

ID	Country	SIB	Year	Location	Maturity	Amount
30	GBR	One Service	2010	Peterborough	5	€7.30
38	GBR	Street Impact	2012	London	3	€0.29 €1.01
40	GBR	T&T innovation	2012	Greater Manchester (Manchester, Salford, Bolton, Oldham, Tameside)	3	€1.17
42	GBR	ThinkForward	2012	Shoreditch East London	3	€1.31
43	GBR	Triodos New Horizon	2012	Greater Merseyside	3	€2.19
33	GBR	Rewriting Futures	2014	Birmingham, Coventry, Solihull, Walsall, and Wyre Forest	3	€0.49
45	GBR	Ways to Wellness	2013	Newcastle	3	€2.41
46	GBR	Welsh Social Impact Bond	2012	Wales	3	€0.14 €0.47
47	GBR	Worcestershire Rebuilding Connections Social Impact Bond	2015	Worcestershire	3	€2.92
48	GBR	Your Chance	2014	Greenwich, Manchester, Oldham, and Rochdale	3	€0.24 €0.73
54	GBR	MHEP	2016	Haringey, Staffordshire & Tower Hamlets	3	€3.155
64	GBR	North Somerset Children's Social Impact Bond	2017	North Somerset	4	€0.3
14	FIN	Epiqus Occupational Well-Being	2015	Central	3	€0.28
63	FIN	EuSEF Social Impact Bond	2017	Finland Country-wide	7	€10
11	IND	Educate Girls Development Impact Bond	2015	Rajasthan	3	€0.27
35	ISR	Social Impact Bond Gets Underway	2015	Tel Aviv	4	€5.00
49	ISR	Tipe2 Diabetes SUB	2015	Tel Aviv	4	€8.00
34	KOR	Seoul Social Impact Bond	2014	Seoul	3	€9.40
36	NLD	Social Impact Bond Rotterdam	2013	Rotterdam	4	€0.84
41	NLD	The Colour Kitchen	2013	Utrecht	2	€0.78
52	NLD	Work after prison	2016	Country-wide	2.5	€1.2
22	POL	Junior Code Academy	2015	Lisbon	1	€0.14

(continued)



**Table 1. (continued)**

ID	Country	SIB	Year	Location	Maturity	Amount
53	SWE	Social Outcomes Contract in Norrköping	2016	Norrköping	4	€1.16
3	USA	Asthma MDP	2013	Fresno, California	4	€0.66
5	USA	Child-Parent Center Pay for Success Initiative	2014	Chicago	4	€7.61 €9.30
6	USA	Chronic Individual Homelessness Pay for Success Initiative	2014	Massachusetts	6	€3.50
7	USA	Connecticut Family Stability Project	2016	Connecticut	4	€12.50
8	USA	Denver Social Impact Bond Program	2016	Denver	5	€3.92 €4.79
20	USA	Increasing Employment and Improving Public Safety	2013	New York State	4	€4.72 €8.78
23	USA	Juvenile Justice Pay for Success Initiative	2014	Massachusetts	7	€11.72 €9.59
29	USA	NYC ABLE Project for Incarcerated Youth	2013	New York City	4	€9.60
31	USA	Partnering for Family Success Program	2014	Cuyahoga County, Ohio	4	€1.78 €2.22
32	USA	Project Welcome Home	2015	Santa Clara County, California	6	€3.80 €3.11
37	USA	South Carolina Nurse-Family Partnership Project	2016	South Carolina	4	€ 30.00
44	USA	Utah High Quality Preschool Program	2013	Salt Lake County, Utah	5	€3.15 €3.85
55	USA	Supportive Housing Social Impact Bond	2016	Denver	5	€11.2 €11.2
56	USA	Family Stability Project	2016	Connecticut	6	€9.16
57	USA	Water Environmental Impact Bond	2016	Washington, DC	30	€20.37
58	USA	REACH	2016	Salt Lake	6	€4.6 €1.46
59	USA	Home not jail	2016	Salt Lake	6	€4.2 €1.6

(continued)

**Table 1. (continued)**

ID	Country	SIB	Year	Location	Maturity	Amount
60	USA	South Carolina Nurse–Family Partnership	2016	South Carolina	6	€13.8
65	USA	Pathways to Economic Advancement	2017	Massachusetts	6	€10.16
66	USA	Oklahoma Women in Recovery Project	2017	Oklahoma	5	€10
67	USA	Santa Clara county partners in wellness	2017	California	6.5	€9.11

Source. Insiglio, Social Finance, and SIBs' disclosed documentation, authors' calculations

Note. The table shows the main characteristics of the SIBs included in our sample. A double amount in the last column indicates a nonsingular issuance. See Table A1 for the variables' definitions. SIBs = social impact bonds.

### Variables' Description

The dependent variable of the baseline model is the share of the total capital subscribed by institutional investors (*Institutional Share*). We also collapsed this percentage into quartiles (*Institutional Quartile*) to run further analyses.

In line with Arena et al. (2016) and Quélin et al. (2017), we organize the explanatory variables, taking into account the financial features and the contractual structure of the SIBs in our sample. The *financial features* employed in the models include the total *amount* of the issue, expressed in millions of euros, the *maturity* of the SIB in years, and the technical form used to transfer financial resources from the investors to the SIB beneficiaries: *grant/donations*, *equity*, or *debt*. Three dummy variables have been created to control for the different typologies of issues; in the baseline model, when an SIB issue includes more than one technical form, each form has been treated as a separate issuance. As a robustness check, we also create the dummy variable “*Mixed*,” which identifies the 20 nonsingular issues, and use it as an alternative explanatory variable. The internal rate of return (*IRR*) has been considered along with the percentage of collateral that guarantees the loan (*% secured*). In the model, the percentage of loan guaranteed has been clustered into three categories: taking the value of 0 if the loan is unsecured, 1 if the collateral covers between 1% and 50% of the loan, and 2 if the collateral covers more than half of the investment.

We also gather information on the SIB *contractual structure*, such as the presence of an *SPV* and the number of underwriters (*#underwriters*). Finally, we check whether the authority sponsoring the SIB issue is *local* or central, in line with the Innobarometer survey founded by the European Commission (see Gallup Organization, 2011; <http://ec.europa.eu/publicopinion/flash/fl305en.pdf>). We expect local PAs to be more innovative (Torugsa & Arundel, 2017), be more directly affected by the results of the project they sponsor, and have an informative advantage compared with central PAs,

which improve both the selection and the follow-up of the projects; therefore, they should be more likely to attract institutional investors.

As controls, we also define the variable *compliance* which takes the value of 1 if the SIB is fully or partially in line with the SIB prototype (according to the definition of Arena et al. 2016<sup>8</sup>), and 0 otherwise. We want to check whether being coherent with the prototype SIB structure increases the likelihood of being financed by institutional investors. Finally, we use the dichotomous variable *UK* to detect the SIBs issued in the United Kingdom and test for a possible first-mover advantage because the first SIBs were organized in the United Kingdom.

## Hypotheses and Analysis

SIBs have been created to incentivize the flow of private capital toward socially relevant projects; some studies indicate that institutional investors are crucial for SIB diffusion (Bafford, 2012); however, their participation is still marginal. To understand which features attract institutional investors the most, we perform a prodromal descriptive analysis and then empirically test the research hypotheses described below.

To highlight the characteristics of the SIBs that have so far attracted institutional investors the most, we first draw on modern portfolio theory (Markowitz, 1952), which suggests that investors should consider both the expected rate of return and the riskiness when making financial investment decisions. Coherently, institutional investors buy and hold securities to generate risk-adjusted financial returns; hence, we select the most relevant *financial features* that drive rational investors' financial decision making (Cox, Brammer, & Millington, 2004). Therefore, our first hypothesis is that institutional investors are more interested in SIBs that guarantee better financial conditions.

**Hypothesis 1:** SIBs with better financial conditions (i.e., higher IRR, longer maturities, and less risky financial tools) are more likely to attract institutional investors.

A peculiarity of institutional investment is that it should satisfy the prudence criterion (Badrinath, Gay, & Kale, 1989). In this particular context, few SIBs provide investors with the necessary risk-management tools they need to select projects and monitor the service providers' activities. We therefore expect that such characteristics are particularly appealing to institutional investors. In particular, we focus on the *contractual characteristics* that reduce agency problems, which are crucial for the success of complex public-private collaborations (Quélin et al., 2017). Thus, our second hypothesis is as follows:

**Hypothesis 2:** SIB contracts with lower expected agency problems (i.e., a lower number of financial participants, an SPV, and a local public authority as a sponsor) are more likely to attract institutional investors.

**Table 2.** Descriptive Statistics.

Total	Amount (€ mn)	IRR	Secured	Underwriters
<i>M</i>	3.69	15.25%	4.37%	3.5
Minimum	0.03	0.00%	0.00%	1
Maximum	14.60	80.00%	100.00%	40
<i>SD</i>	3.92	18.02%	15.98%	4.85
<i>n</i>	79	79	79	79
Debt	Amount (€ mn)	IRR	Secured	Underwriters
<i>M</i>	3.51	12.92%	7.39%	4
Minimum	0.03	1.00%	0.00%	1
Maximum	14.60	80.00%	100.00%	40
<i>SD</i>	3.82	16.64%	20.92%	6.13
<i>n</i>	44	44	44	44
Equity	Amount (€ mn)	IRR	Secured	Underwriters
<i>M</i>	3.73	21.29%	0.08%	3
Minimum	0.12	2.50%	0.00%	1
Maximum	11.2	75.00%	10.00%	10
<i>SD</i>	3.74	20.59%	2.77%	2.52
<i>n</i>	25	25	25	25

Source. SIBs' disclosed documentation, authors' calculations.

Note. The table provides the descriptive statistics of the four main financial and contractual features for the whole sample and for two subsamples of SIB contracts financed with debt and equity. See Table A1 for the variables' definitions. SIBs = social impact bonds; IRR = internal rate of return.

### Data Collection and Sample Description

The analysis proceeds by focusing on the technical characteristics of the 67 SIBs in the sample. Table 2 shows the amounts of the SIBs in millions of euros, the internal rate of return offered if a project is successful, the percentage of investment covered by collateral, and the number of underwriters. The total number of observations exceed the number of contracts because some SIBs have a double issuance; in most cases it consists of a contemporary issuance of equity and debt, in two cases the social project is jointly funded by equity and donation, and in one case by loans and donation.

The issuances are rather small compared with those usually placed in debt or equity capital markets, with a mean amount of €3.69 million per SIB. The expected interest rate (IRR) is significantly higher than the current average market returns, but it shows great variability, ranging from 1% to 80% and from 2.5% to 75% for debt and equity issues, respectively. On average, only 4.37% of the gathered resources are guaranteed. Only in one case, for a Belgian SIB set up to finance immigration projects, the debt issue is fully guaranteed; however, the maximum percentage of the secured equity issue is, on average, much lower at approximately 10%. The mean number of

**Table 3.** Determinants of Institutional Investors' Participation.

	(2) Institutional share	(3) Institutional quartile
Financial features		
Amount	0.023 (0.021)	0.005 (0.014)
Maturity	0.052 (0.071)	0.063 (0.050)
Equity	0.376* (0.210)	0.326** (0.152)
Debt	0.458** (0.190)	0.336** (0.143)
IRR	0.097 (0.563)	0.075 (0.380)
% Secured	-0.149 (0.425)	-0.092 (0.300)
Contractual features		
SPV	0.185 (0.142)	0.190** (0.090)
#Underwriters	-0.074** (0.034)	-0.031 (0.022)
Local	0.355** (0.160)	0.241** (0.105)
Control variables		
Compliance	-0.011 (0.165)	0.011 (0.111)
UK	0.673*** (0.190)	0.444*** (0.115)
Pseudo-R <sup>2</sup>	.1919	.1401
Number of observations	79	79

Note. This table presents the results of the estimation of a tobit (1) and a probit (2) regression on the full sample. The dependent variable of Model 1 is the percentage of the total capital raised by an SIB issue subscribed to by institutional investors; the dependent variable of Model 2 is the quartile of institutional investors' participation. See Table A1 for the variables' definitions. The models are overall significant and correctly specified, according to the ReSET test. Standard errors are reported in parentheses and are robust to heteroscedasticity. SIB = social impact bond; ReSET = Ramsey Regression Equation Specification Error Test.

\*\*\*, \*\*, and \* denote coefficients significantly different from 0 at the 1%, 5%, and 10% levels, respectively.

underwriters participating in the deal is 3.5, but once again, there is great variability; the maximum number of underwriters participating in debt issues is 40, and it significantly decreases to 10 for equity issues. As expected, equity investments require a significantly higher IRR than debt but lower collateral.

### Empirical Strategy

To identify the financial and contractual features that most attracted the institutional investors in our sample, and therefore infer the determinants of institutional investors' participation, we regress the variable *Institutional Share* against two sets of explanatory variables representing our hypotheses, as exemplified in Equation 1:

$$Inst.Share_i = \alpha + \beta_1 Financial\ features_i + \beta_2 Contractual\ features_i + \beta_3 Controls_i + \varepsilon \quad (1)$$

The dependent variable assesses the percentage of institutional investors' participation out of the entire capital for each SIB issuance, as shown in Table 3, column 1, or

the probability for the institutional investors' participation to be in the highest quartile of the distribution, as shown in column 2.

The first set of explanatory variables identifies the *financial features* of the issue: the amount, maturity, and technical form of the issue; the rate of return offered in case of success; and the percentage of investment guaranteed by the collateral (see Table 3). The cluster *Contractual features* identifies the presence of an SPV, the number of shareholders participating in the deal, and whether the SIB has been organized by a local public authority. Finally, two dummy variables control whether the SIB is set up in the United Kingdom and whether it is in line with the prototypical SIB, according to Arena et al.'s (2016) definition.

In a previous analysis, which has not been reported, we also checked for the social issue addressed by each SIB, but it led to inconclusive results, possibly because the most recent SIB issuances often gather funds for different social issues at one time.

Two statistical approaches are employed to test these relationships. The baseline model is a tobit regression (see column 1, Table 3); the dependent variable *Institutional share*, censored from below, is the percentage of the institutional investors' participation in the SIB's capital, and it is regressed against the explanatory variables mentioned above. Table 3, column 2, presents an ordered probit model that allows us to infer the marginal effect of the same set of independent and control variables used in the baseline model on probability that the institutional investors' participation falls in the highest quartile of the distribution; overall, the regression results lead to similar conclusions.

## Main Results and Discussion

Our H1 posits that institutional investors are more interested in SIBs that guarantee better financial conditions. Our empirical analysis suggests that the variables *IRR*, *maturity*, and *secured* have no significant impact on institutional investors' participation in an SIB. Looking at the financial form of the SIB issuance, we find that these investors prefer less risky financial tools: Debt and equity issuances are preferred over donations, and more specifically, debt exceeds equity in both magnitude and significance. According to the Wald test, the difference between the two coefficients is statistically significant. We carried out a robustness test (see Table A2) that deepens this result. Instead of controlling for the technical form of the issuance, the variable "*mixed*" identifies the 20 nonsingular issues in our sample. The coefficients show a positive and significant effect of this variable on the institutional investors' relative participation, which strengthens our previous result. Institutional investors try to minimize the risk they take while choosing the technical financial form for their investment; therefore, they prefer double issuances, in line with the diversification principle.

In summary, H1 is partially accepted, as we find a confirmation that institutional investors prefer the least risky form of funding, but other financial conditions do not seem to play a relevant role.

Our H2 is related to the contractual structure. We expect a higher participation by institutional investors in SIBs that offer greater visibility and help investors reduce agency problems. Our first finding is that institutional investors prefer projects with a

limited number of stakeholders. Indeed, the variable *#Underwriters*, which identifies the number of capital providers in an SIB issue, shows a strongly negative coefficient in both columns (1) and (2) of Table 3.

The first result is in line with the visibility motivation (Barajas et al., 2014). Moreover, being a solo investor could mitigate agency problems and improve monitoring activities. In this way, at least in principle, institutional investors can exert closer control when co-funding a project with few other investors, rather than as one in a crowd of underwriters (Callanan & Law, 2012). The second result is related to *Local* authorities; the coefficients of this variable are strongly positive and statistically significant in both specifications: Institutional investors in our sample prefer SIBs that involve local public authorities. Previous studies on PPPs posit that local public authorities could play an important role in agency problem mitigation (Chen & Bozeman, 2012; Torugsa & Arundel, 2017; Van Slyke, 2006). In effect, local authorities are well established in the social fabric and thus are better informed on both the social areas that need the most external intervention and the projects that are the most likely to be successful. This informational proximity can potentially decrease the uncertainty of the social project's outcome and is highly valued by institutional investors. The third result is related to the presence of an *SPV*. We find that the presence of an intermediary who organizes the SIB through an *SPV* has a positive impact for the investors of the top quartile; from previous studies, we know that an *SPV* is generally accepted as a risk-mitigating factor in PPPs (Rufin & Rivera-Santos, 2010). The analysis of our data set suggests that the larger the institutional investor participation in an SIB, the higher the importance of an *SPV*.

In summary, H2 cannot be rejected because the regression results show that SIB contracts with expected lower agency problems (lower number of financial participants and local public authorities) are more likely to attract institutional investors.

Finally, we find a positive and significant effect of the U.K. control, as it may capture a sort of first-mover advantage, whereas being compliant with the SIB prototype does not seem to influence the participation choice of the institutional investors.

The main empirical findings suggest that what motivates institutional investors the most to heavily participate in an SIB are the contractual characteristics, which allow them to better monitor the social project's development, have greater visibility, and minimize the agency problems. Therefore, SIB's contractual design may be exploited as an effective tool to attract institutional investors, instead of mainly focusing on appealing financial terms, such as the internal rate of return or the collateral that sharply erodes the public saving both directly and indirectly.

## Conclusion

SIBs are financial tools that could help both NPOs and PAs financing innovation in the social field (Jackson, 2013; Liang et al., 2014; Nicholls, 2013; Stoesz, 2014). NPOs could benefit from this new source of funding in terms of both financial diversification and risk reduction as the SIB investors bear the projects' risk (Butler

et al., 2013). PAs are asked to pay a premium only in the event of a project's success, rebating a portion of the cost reduction to the investors. Notwithstanding these strong premises, SIBs' diffusion is quite limited because only 107 SIB projects have been implemented in the past 8 years (Instiglio, Social Finance). Institutional investors are the key to success (Bafford, 2012; Fraser et al., 2016), but SIBs have failed to significantly attract their interest so far. We empirically examine the implemented SIBs and attempt to understand the factors that most attract institutional investors, bearing in mind the typical limitations of an empirical analysis carried out on a representative sample of a broader population (i.e., for instance, there might be further confounding factors at work or sample selection bias toward SIB issuers willing to disclose information).

Distinguishing between financial and contractual features (Arena et al., 2016; Quélin et al., 2017), we provide empirical evidence that institutional investors exploit the tools they have to minimize the risk of their investment and that contractual characteristics play a dominant role in explaining institutional investors' participation. First, from our data, we find that the presence of a local PA has a positive and significant impact on the likelihood of institutional investor participation. The explanation of this result could be related to the greater incentives of a local PA to closely monitor the projects, thus reducing agency problems (Chen & Bozeman, 2012; Torugsa & Arundel, 2017; Van Slyke, 2006). Second, we provide evidence that institutional investors are more likely to participate in an SIB where the number of participants is smaller. This result is in line with the visibility motivation (Barajas et al., 2014). Moreover, at least in principle, these investors can exert a closer control when co-funding the project with few other investors, rather than as one in a crowd of financial providers (Callanan & Law, 2012). Finally, we find that the larger the investor participation in an SIB, the greater the importance of an SPV. Previous studies on PPPs have argued that the presence of an SPV is a risk-mitigating factor because it reduces agency problems (Rufin & Rivera-Santos, 2010). We empirically find that this result holds also for SIBs when institutional investors own a larger stake of the investment.

Looking at the financial form of the SIB issuance, we find that these investors prefer less risky financial tools: Debt and equity issuances are preferred over donations, and more specifically, debt exceeds equity in both magnitude and significance; moreover institutional investors prefer double issuance, in line with the diversification principle.

In conclusion, drawing on this unique data set, we suggest the use of SIB structures that encourage institutional investor participation. A local PA, a small number of investors, and the presence of an SPV are the factors that play a relevant role in reducing both agency problems and information asymmetries among the players involved.



## Appendix

**Table A1.** Variables' Definitions.

Variable	Definition
<b>Contextual and control variables</b>	
Name	Name of the SIB
Country	Country of issuance
UK	Dummy variable taking the value of 1 if the SIB is issued in United Kingdom, 0 otherwise
Compliance	Dummy variable taking the value of 1 if the SIB is compliant with the original prototype
<b>Financial features</b>	
Amount	Investment needed
Maturity	Contract duration
Equity	The SIB is issued as equity
Debt	The SIB is issued as debt
Donation	The SIB is issued as a donation
Mixed	The variable identifies nonsingular issues
IRR	Internal rate of return, %
% Secured	Categorical variable taking the value of 0 if the loan is unsecured, 1 if the collateral covers between 1% and 50% of the loan, and 2 if the collateral covers over half of the investment.
<b>Contractual characteristics</b>	
Central	Dummy variable taking the value of 1 if the public authority that organizes the SIB is centralized, and 0 otherwise
Local	Dummy variable taking the value of 1 if the public authority that organizes the SIB is local, and 0 otherwise
SPV	Presence of a special purpose vehicle
#Underwriters	Number of underwriters taking part in the deal
<b>Target variables</b>	
Institutional share	Institutional investors' participation in the SIB issue, %
Institutional quartile	Categorical variable taking the value of 1 if the institutional investors' participation falls in the lowest quartile of the distribution, 2 for the second quartile, 3 for the third, and 4 for the highest quartile

**Table A2.** Determinants of Institutional Investors' Participation.

	Institutional share
<b>Financial features</b>	
Amount	0.010 (0.022)
Maturity	0.063 (0.067)
Mixed	0.377** (0.190)
IRR	0.216 (0.496)
% Secured	0.147 (0.398)

(continued)

**Table A2. (continued)**

	Institutional share
Contractual features	
SPV	0.302** (0.151)
#Underwriters	-0.055* (0.033)
Local	0.288* (0.150)
Compliance	-0.008 (0.143)
UK	0.560*** (0.194)
Pseudo-R <sup>2</sup>	.1915
Number of observations	79

Note. This table presents the results of the estimation of a tobit model. The dependent variable of the model is the percentage of the total capital raised by an SIB issue subscribed by institutional investors. The model is significant and correctly specified, according to the ReSET test. Standard errors are reported in parentheses and are robust to heteroscedasticity.

\*\*\*, \*\*, and \* denote coefficients that are significantly different from zero at the 1%, 5%, and 10% levels, respectively, in two-tailed tests.

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### Notes

1. For the purposes of this article, social impact bonds (SIBs) and development impact bond (DIBs) are jointly considered and are referred to as SIBs. As a matter of fact, the only difference between these two types of impact bonds is that in an SIB the outcome payer is the government, whereas in a DIB the outcome payer is a donor.
2. The special purpose vehicle (SPV) is a legal entity that is independent of the parent corporation and created for a specific task, such as, in this case, the acquisition of funding.
3. A practical example of the way these actors cooperate together in an SIB is given, for instance, by the Benevolent Society Social Benefit Bond. In this case, a pool of intermediaries (Westpac, Perpetual, and Commonwealth bank), which acts as issue managers and trustees, issues the bonds through an SPV and provides funds to the service provider (Benevolent Society). The target population of the project are families that are at risk of having their children removed and placed into out-of-home care. This project enables the New South Wales Government to spare public funds on such a social issue and to pay out part of this savings in the form of an interest rate to the external investors, which provides capital to the intermediaries in the first place. The degree of success of the project, which determines the interest payment, is assessed by an external evaluator (ARTD Pty Limited).
4. <http://www.socialfinance.org.uk/services/social-impact-bonds/>
5. <http://www.instiglio.org/en/sibs-worldwide/>

6. <http://www.payforsuccess.org/activity/>
7. According to Instiglio.org,

the design stage covers projects that meet all three criteria outlined below, but where services have not started. 1) Public information of an impact bond being designed. 2) Publicly available information about the social issue and the population that the program is targeting. 3) Publicly available information about the location where the program will be implemented.

The SIBs in the design stage are excluded from our sample as they have not been funded, yet. The implementation stage, on the contrary, “includes projects where the impact bond is actively being implemented” or implies that “public information indicates that the impact bond has been launched and the relevant contracts have been signed.” Finally, completed SIBs include “impact bonds that have concluded, where the payments to investors should have been calculated and disbursed.”

8. According to Arena, Bengo, Calderini, and Chiodo (2016), SIBs that are fully compliant with the prototype model must address a new program with an ad hoc social intervention; the intermediary plays a leading role in overseeing project implementation, arranging project funding, distributing funds, and managing repayment to funders; the structure of the interventions must be flexible and customizable.

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