

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

**Alfonso Del Giudice\* and Milena Migliavacca**

Università Cattolica del Sacro Cuore, Largo Gemelli, 1, 20123 Milan, Italy

## **Abstract**

Social Impact Bonds (SIBs) have been increasingly attracting the attention of scholars, policy makers, and investors over the last five years. Notwithstanding good intentions and policy maker enthusiasm, SIBs have failed to attract significant private capital to date. Taking into account the SIBs issued worldwide to date, we investigate both financial and contractual characteristics of the contracts. We provide evidence that financial investors are more likely to finance SIBs with fairly long maturities, greater size, and higher internal rates of return (IRR). We find that institutional investors prefer to let local public administration authorities address social housing or recidivism reduction projects. We argue that institutional investors are more likely to participate in an SIB scheme when the measurability of a project's social impact is clearer and agency problems are lower. The riskiness of the investment does not prevent institutional investors from participating in an SIB issue.

**Keywords:** Social Impact Bonds; NPOs; Institutional Investors; Impact Investing

**Corresponding Author:** Alfonso Del Giudice, Business and Economics Department, via Necchi 7, 20123 Milano.

Email: [alfonso.delgiudice@unicatt.it](mailto:alfonso.delgiudice@unicatt.it)

## **1. Introduction**

In recent years, Non-Profit Organizations (NPOs) have been called upon to provide an increasingly widening range of services, whereas the available resources physiologically tend to decrease during a crisis period when they are most needed (Joy and Shields, 2013). The relevant literature typically recognizes three main sources of funding for NPOs: funding from non-lending institutions, internal funding, and funding from the capital market (Tuckman, 1993). Non-lending institutions, such as private donors, other nonprofits, governments, foundations, and corporations, are the main source of funding. These non-lending institutions usually only support short/medium-term projects and require the active participation of the funders in the definition of the social mission. In recent years, there has been a significant growth of control on the donors' side in the wake of the New Public Management emphasis on markets and performance management within the public sector (Ostrander, 2007; Warner, 2013). Donations and endowments, though, have an intrinsic component of volatility, as they depend on the economic cycle and the way it affects High Net Worth Individuals' (HNWI) expected permanent income (Hughes and Luksetich, 2008). Government grants primarily cover current charitable services but rarely provide NPOs with the capital assets they need to deliver most of their services to the public (Calabrese and Ely, 2015).

The accumulation of unrestricted net assets represents the main source of internal funding as well as the only typology of funding controllable by non-profit decision makers (Calabrese, 2012), which is a peculiarity that allows NPOs to reduce their organizational financial vulnerability. The third source of funding—the capital market—is reduced to borrowing, mainly in the technical form of tax-exempt bonds. This funding form, though, has been undergoing a deep revision process; in the US, for instance, there are plans to replace tax-exemptions with tax-credits or to eliminate tax-exempt bonds, such as municipal bonds, in order to reduce the federal deficit (Calabrese and Ely, 2015).

The counterparts that NPOs can rely on in order to raise the financial resources they need are particularly concentrated, making it problematic for them to diversify their sources of funding.

It is well recognized in the literature that NPOs must have a more flexible relationship with both public and private sectors (Abzug and Webb, 1999; Young, 2000) as well as have access to more conspicuous, diversified, and stable funding solutions (Huges and Luksetich, 2008; Mayer et al., 2014).

During the last half decade, an innovative form of funding for NPOs was introduced within the financial markets: the social impact bond (SIB),<sup>1</sup> which was welcomed as the definite answer to NPOs' unaddressed financing issues; however, this has so far failed to become their reference source for funding (Warner, 2013).

An SIB is a financial asset whose objective is to attract private capital to finance social programs; it provides investors with an incentive, in the form of IRR, if the project meets predefined social outcomes that in turn allow for lower public expenses. Investors place a bet with the public administration (PA) that a social project managed by an NPO will be successful. Given their complexity, SIBs have gathered the attentions of policymakers, scholars and practitioners, but they have triggered much debate as well. To date, attention has been focused on issues such as the risk-shift from the public to the private sector, the actual monitoring capacity on the investors' side, and the relevant setup and transitional costs that SIB mechanisms require (OECD's seminar Paris, 2015). These criticalities may reasonably discourage access to private capital, especially from institutional investors whose intervention is crucial for the success of SIBs as a valuable alternative source of funding for NPOs.

---

<sup>1</sup> For the sake of this paper, Social Impact Bonds (SIBs) and Development Impact Bond (DIBs) are jointly considered and 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, while in a DIB, the outcome payer is a donor.

This paper explores both the financial characteristics (e.g., size of the issuance, maturity, technical form, internal rate of return and collateral) and the contractual features (i.e., number of players, social issue, and the presence of a social purpose vehicle) of the SIBs implemented to date using a unique database, which collects and systematizes the structures of all the SIBs worldwide issued so far, to the best of our knowledge. Furthermore, we match this information with the typologies of participating investors (e.g., private investors, charities, foundations, NPOs, and institutional investors) in order to gain a better understanding of the determinants that best explain the institutional investors' participation. More specifically, as we think that the presence of an institutional investor is fundamental for the SIB's diffusion, we look at the technical characteristics of SIB issuances that most attracted private capital. By analyzing the characteristics of the SIBs where institutional investors are more present in terms of funding, we manage to infer what most encourages their participation.

This paper contributes to the existing literature in several ways. First, we provide an empirical analysis of the financial features that characterize the SIBs issued to date; second, we offer empirical evidence about the main financial and contractual characteristics that most attract institutional investors; third, we find that some contractual features are far more relevant to explain institutional investors' participation in an SIB scheme rather than financial variables. In effect, while the excessive risk taking could be compensated by a higher expected IRR, the complexity of the measurability of the projects' impact or agency problems among the players highly discourage institutional investors.

The paper proceeds as follows. We first outline the structure of an SIB, and next we present the data and the variables used in the model. The fourth section describes the models, empirical evidence, and comments on the research findings; we finally offer some final remarks.

## 2. Social Impact Bonds: structure and players

Social Impact Bonds (SIBs) are financial products aimed at gathering private funding used to support social programs. SIBs allow governments to use a market-based mechanism to finance welfare initiatives whose successful implementation is expected to address a specific social issue and consequently reduce future public expenditure. They are pay-for-success assets; the private capital is refunded and remunerated only if the funded project meets its contractual objectives. They are usually employed to fund particularly innovative (and risky) projects that otherwise would hardly be supported by public funding. SIBs are rather complex instruments, as they involve multiple stakeholders whose incentives are potentially difficult to align, and they are rather costly in terms of setup and transaction costs. Such costs, though, are expected to gradually diminish as the number of active SIBs increases and the setup becomes increasingly more standardized. Despite the fact that SIBs are fairly new financial instruments,<sup>2</sup> they have already been implemented in a number of countries (e.g., Australia, Belgium, Canada, Finland, Germany, India, Ireland, Israel, Netherlands, Peru, Portugal, Switzerland, South Korea, the United Kingdom, and the United States), and seem to be a valid piece of financial innovation for financing social services. Moreover, a number of investment banks have set *ad hoc* branches that address social finance and impact investing (such as Goldman Sachs and JPMorgan Chase).

In a nutshell, an SIB scheme is developed around a professional intermediary who raises funds from private investors (i.e., institutional investors), charities or foundations and distributes them to social service providers. If the social objective is achieved, the government who planned the intervention in the first place or the intermediary itself proceeds with the investors' refunding. The final beneficiaries of the SIB mechanism are vulnerable citizens; the target groups involved to date are quite heterogeneous regarding size and typology of social issues; for instance, the NYC

---

<sup>2</sup> The first SIB was established in the UK in September 2010. The SIB raised £5m external investment to fund a program aimed at reducing re-offending rates among short-sentenced prisoners leaving Peterborough Prison.

ABLE project for incarcerated youth focuses on approximately 10,000 adolescents, whereas Sweet Dreams SIB in Canada targeted only 22 mothers.

Despite the name, SIBs are not proper financial bonds but rather future contracts on social outcomes and can be issued either as debt capital or, more often, as equity in the form of donations (Joy and Shields, 2013). They are the financial response to the New Public Management's emphasis on outcome-based contracts in the public sector and an evolution of PPPs (Warner, 2013). They can be stylized as a principal-multiagent relationship that typically involves five actors: Public Administration (PA), Service Providers (NPO), an Intermediary, Outside Investors, and External Evaluators.

The PA 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 preventative interventions, funded via an SIB, reduces future public expenditure and generates cashable savings; the saved financial resources are then partially used to refund and compensate private investors. The main areas of interventions funded via an SIB issuance to date have been youth offender rehabilitation, reduction of recidivism in prisons, family support services, youth unemployment among immigrants, support to female victims of domestic violence, homelessness, and preschool education. Based upon robust evidence, these areas have proven to have potential for relevant social and financial returns (Reynolds and Temple, 2009; Heckman et al., 2010).

The second non-financial actor is the *social service provider*, typically social enterprises or NPOs. Service providers are the only actors directly in contact with the final beneficiaries of the SIBs. They receive the funds collected from the investors and use them as working capital to cover the operating costs necessary to deliver the social service and possibly a predetermined remuneration. As noted by Gustaffson et al. (2015), depending on the structure of the SIB, service providers may

also act as investors. Furthermore, they are responsible for the supply of the service and the success of the project; their role is crucial, as we recall that SIBs are pay-for-success initiatives.

Both PAs and NPOs are particularly risk-averse, as are the vast majority of financial actors, and the embedded riskiness of social-impact investments, especially if they are particularly innovative, discourages these actors from undertaking such projects. This risk-aversion may cause adverse selection of the investment projects and the *cherry-picking* of the most traditional consolidated ones, regardless of the social interest.

In this context, *intermediaries* have a key role, as they are the actors that professionally transform and reallocate risks with a fair remuneration in return. Within the SIB mechanism, the financial intermediary organizes the issuance, designs the features of the financial instruments, and sets up a Special Purpose Vehicle (SPV).<sup>3</sup> The intermediary, via the SPV, issues financial instruments, usually bonds or stocks, and receives financial resources from outside investors. The intermediary recruits private capital, remunerates the investors according to the repayment schemes, and it manages the financial flows from and towards the service providers and the external evaluators. It can act as a mediator of the stakeholders involved in the scheme in order to better align the different interests and incentives.

*Outside investors* provide capital by purchasing the financial instruments issued by the intermediary.

These actors bear the whole risk of their investment in a specific social project, but they cannot exert any form of control, which is similar to minor investors in a listed company, although NPOs suffer from information asymmetry, which is exasperated by the peculiarity of the areas in which they operate.

---

<sup>3</sup> The Special Purpose Vehicle (SPV) is a legal entity, independent from the parent corporation, created for a specific task, such as in this case the acquisition of funding.

The percentage of capital allocated to institutional investors (such as, investment banks, insurance companies, pensions fund, hedge funds and mutual funds) is a rough but fairly precise indicator of an SIB's success. These subjects, as a matter of fact, are able to provide a significant amount of financial resources and can professionally manage the risk derived by the social mission funded via the SIB. The demand for transparency and control on the investors' side has significantly increased in the last few years, and the use of contract features, such as rather high IRRs, covenants, capital protection mechanisms and early termination contract clauses or even tax-exemption, have become more frequent in order to attract institutional investors (Struthers, 2013). Finally, primary importance is given to the *External Evaluators*, who have the crucial role of assessing the feasibility of the social mission and transform the multiplicity of goals the government pursues in quantitative, objectively assessable indicators. Investors' repayment is triggered by the attainment of agreed outcomes, and the return is linked to either the achievement of the goal or different levels of outcome. The SIB scheme needs to link rigid, unambiguous, quantitative metrics not only to the expected outcomes but also to coherent target groups of beneficiaries. This rigidity, though, might privilege easily measurable intervention projects rather than more complex, interactive programs, or incentivize *cream skimming* or *cherry picking*, regardless of the social urgency of the project (OECD report, 2016).

Apart from the principal actors mentioned above, additional stakeholders may take part in the SIBs mechanism, such as guarantors, legal advisors, subordinate investors, and social rating agencies. SIBs blend together philanthropy, social projects, and venture capitalism into a complex financial product that seeks to bridge the gap between public needs for resources and private financial surplus. When government, investors and service providers' expectations are coherent, SIBs have the potential to bring new capital and efficiency to social service supply. The incentive alignment is crucial for the success of the SIB schemes, but according to the current design, the allocation of risk among the actors involved is so unbalanced that it may undermine the entire



mechanism at its roots. Ensuring social services that are accountable to vulnerable groups of citizens is of primary importance; therefore, at this stage, SIBs could be more appropriate as a complementary mechanism for social services delivery (OECD, 2016).

### 3. Data and Methods

This study considers all the SIBs issued up to July 2016, apart from those that explicitly ban institutional investors as possible lenders. As the purpose of our paper is to shed light on the determinants of the institutional investors' participation, we limit our sample to the SIBs that reached the implementation stage and projects in which service provisions have already started.

#### *Data and variables*

The sample consists of 50 SIBs.<sup>4</sup> Two main data sources are exploited: the website of instiglio.org regularly tracks SIB projects, reports, and other relevant documentation disclosed on the internet for each SIB issue in order to gain technical information on the issuance. Among the information gathered, the predictors we selected fall into four main categories: contextual variables, technical features, information on the SIB structure, and the social issues addressed (see Appendix Table A.1).

Contextual information allows us to identify the SIB and the country of issuance; we create a dichotomous variable (*UK*) to detect the SIBs organized in the United Kingdom (UK) and test for a possible first-mover advantage, as the first SIBs were issued in UK. The technical features, employed in the model as explanatory variables, 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

---

<sup>4</sup> Our dataset includes 50 SIBs issued up to July 2016 and covers 15 countries worldwide: Austria (1 SIB), Australia (2 SIBs), Belgium (1 SIB), Canada (1 SIB), Finland (1 SIB), Germany (1 SIB), India (1 SIB), Israel (2 SIBs), Korea (1 SIB), Netherlands (2 SIBs), Portugal (1 SIB), Switzerland (1 SIB), United Kingdom (23 SIBs) and the United States. (12 SIBs).

resources from the investors to the SIB beneficiaries: *donations*, *equity* or *debt*. Three different dummy variables have been created to control for the three typologies of issue; when the SIB issue included more than one technical form, each one has been treated as a separate issuance. The internal rate of return (*IRR*) has been considered along with the percentage of collateral that guarantees the loan. 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 over half of the investment (*% secured*). Finally, we considered the overall cost of the SIB issuance (*fee*). We gathered information on the SIB structure as well, such as the presence of a special purpose vehicle (*spv*) and the number of *providers*. Our dependent variable is the share of total capital subscribed by institutional investors (*Institutional Share*). We collapsed this percentage into three clusters (  $\leq 30\%$ ;  $31\% - 60\%$ ;  $\geq 61\%$  ) (*Institutional tertile*) in order to run robustness checks of the baseline model. Finally, the Instiglio dataset provides information on the *social issue* addressed by the SIB, which we control with seven dummy variables (*Education*, *Family*, *Health*, *Housing*, *Recidivism*, *Employment* and *Immigration*). The four main buckets of potential explanatory variables described above have not been the subject of much inquiry, so we summarize in Table 1 the hypothesized effects of these variables on the share of capital subscribed by the institution in an SIB issuance.

**Table 1. Summary of Hypothesized Direct Effects on Institutional Investors Participation**

	Expected effect on Institutional Participation
<i>Financials</i>	
Amount	+
Maturity	+
Equity	-
Debt	+
IRR	+
% Secured	+
Fee	-
<i>Contractual Features</i>	
SPV	+
#Providers	-
Local PA	+
<i>Social Issue</i>	
Education	+/-
Family	+/-
Health	+/-
Housing	+
Recidivism	+
Employment	+/-

*Note.* A number of explanatory variables reported in the table - characterized by a +/- sign in the second column - have never been regressed against the preferences of institutional investors, so there is no theoretical expected sign.

From a financial point of view, we expect that the *amount* has a positive impact on institutional investor participation because of the economy of scale of the valuation effort. *Maturity* has an expected positive sign because SIBs require time to provide social impact results so the longer the better. In fact, from a financial point of view, SIB investors hold an option on the project so the longer the maturity the higher the value of the option. We expect that *debt* issues are preferred to *equity* issues because they are less risky. *IRR* is expected to attract investors' participation so it has an expected positive coefficient. We also expect that the higher the proportion of *secured* investment, the higher the probability of investors' participation because it reduces the risk. Finally, we expect that higher *fees* reduce the interest of institutional investors in an SIB.

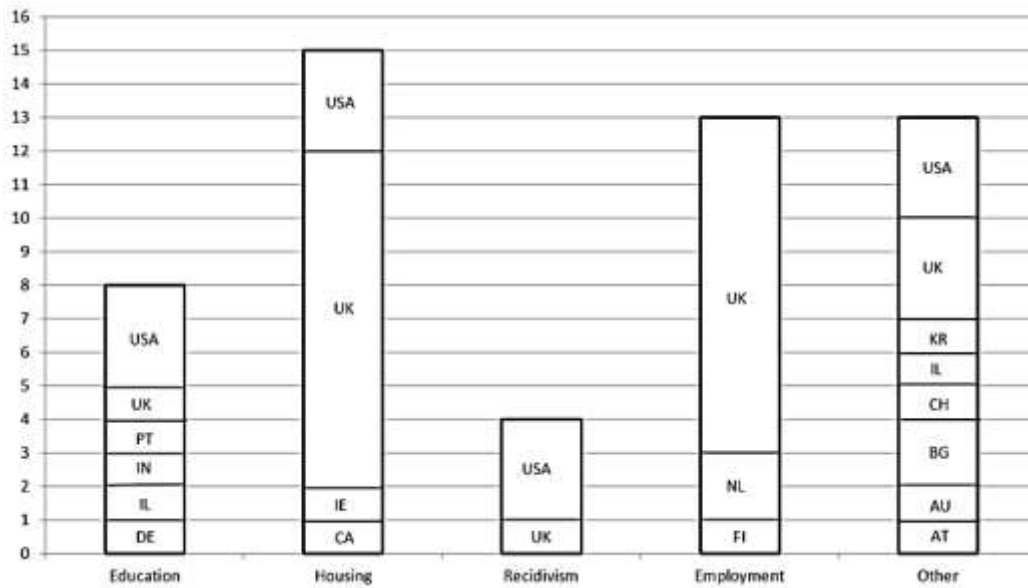
From a contractual point of view, we expect that the presence of an intermediary who organizes the SIB through an *SPV* reduce the information asymmetry among the players so the investors'

participation is encouraged. On the other hand, if the number of *providers* is higher, agency problems are higher (i.e., free riding on the contract valuation or on the monitoring activities of the SIB), so we expect a negative impact on institutional investor participation. The *local PA* is expected to increase the probability for investors to participate because it is recognized as more risk averse than a central PA and more directly interested in the results of the project, thus reducing agency problems.

Finally, the *social issue* of the SIB plays a key role; in effect, some impact measures are more easily measured in some social areas than in others, increasing the institutional investors attraction. As far as we know, *recidivism* and *social housing* have more traditional metrics to rely on, so we expect a positive sign for these two categories.

Table 2 shows the frequency of SIBs social issues by country. *Education* is the social area approached by the highest number of countries: there are three SIBs in the United States (USA) that address educational projects, and Germany, Israel, India, Portugal, and the UK have one SIB each dedicated to this issue as well. The UK is the most active country with the exception of educational projects. It has ten SIBs addressing both *housing* and *employment* projects, two SIBs in *healthcare*, and one in *family* issues, which are grouped together in the residual category on the right-hand side of the table. *Recidivism* is related to the projects of prisoners' re-education. This residual category includes SIBs issued to finance family, health, and *immigration* projects. This last social issue is becoming particularly topical, especially in Europe, and both Switzerland and Belgium issued one SIB in order to raise funds devoted to solve social issues related to immigration.

**Fig 2. Social Issue Distribution by Country**



*Source: Instiglio, authors' representation*

### *Data analysis*

SIBs have been created to incentivize the flow of private capital towards socially relevant projects; the ultimate private capital lenders are the institutional investors, who bring large amounts of venture capital and professionally manage the risk associated with such projects. The intermediary who sets up SIB contracts can use specific technical features (such as the rate of return, the technical form of the issue, and the maturity) to attract private capital. To understand which technical features attract institutional investors the most, we perform a prodromal descriptive analysis, and then we empirically test our research question.

The analysis proceeds focusing on the technical characteristics of the 50 SIBs implemented up to July 2016. Table 3 shows the SIBs' amount in millions of Euros, the internal rate of return offered when a project is successful, the percentage of investment covered by collateral, the number of underwriters, and the percentage cost of the SIB. The total number of observations exceeds the number of contracts because some SIBs had a double issuance of both equity and debt.

**Table 2. Descriptive Statistics**

*Amount is the of the size of the issue, expressed in millions of Euros. IRR is the internal rate of return. Secured is the % of the amount guaranteed by a collateral. Providers is the number of financing institutions. Fee is the overall cost of the issue in % of the amount.*

<b>TOTAL</b>	Amount	IRR	Secured	Providers	Fee
<i>Mean</i>	3.6 m	13.31%	5.23%	3	6.63%
<i>Min</i>	30.000	1.00%	0.00%	1	0.00%
<i>Max</i>	30	60.00%	100.00%	13	18.00%
<i>st dev</i>	4.88	15.58%	17.37%	2.55	4.47%
<i>Num</i>	65	65	66	66	65
<b>DEBT</b>	Amount	IRR	Secured	Providers	Fee
<i>Mean</i>	4.35 m	11.20%	8.33%	4	6.00%
<i>Min</i>	30.000	1.00%	0.00%	1	0.00%
<i>Max</i>	30 m	60.00%	100.00%	13	14.00%
<i>st dev</i>	5.77	13.89%	22.07%	2.83	3.63%
<i>Num</i>	39	39	39	39	39
<b>EQUITY</b>	Amount	IRR	Secured	Providers	Fee
<i>Mean</i>	2.77	19.71%	0.95%	3	6.55%
<i>Min</i>	120.000	2.50%	0.00%	1	0.00%
<i>Max</i>	9.4	60.00%	10.00%	10	16.00%
<i>st dev</i>	3.18	18.86%	3.01%	2.07	5.25%
<i>Num</i>	20	20	21	21	20

*Source: SIBS disclosed documentation, authors' calculations*

The issuances are rather small when compared with those usually placed in debt or equity capital markets, with a mean amount of €3.6 million per SIB; interestingly, this amount is higher for debt (€4.35 m) than for equity issues (€2.77 m). The expected interest rate (IRR) is rather high when compared to the current average market returns, but it shows great variability, ranging from 1% to 60% and from 2.5% to 60% for debt and equity issues, respectively. In one case, a Belgian SIB is set up to finance immigration projects, and the debt issue is fully guaranteed; however, the maximum percentage of secured equity issue is much lower, at 10%; on average, only 5.23% of the gathered resources are guaranteed. The mean number of underwriters taking part in the deal is three, but there is great variability; the maximum number of providers participating in debt issues is 13, and this number only partially decreases to 10 for equity issues. Finally, the setup costs are rather high, but once again, with great variability; they range from 0% to 14% for debt issues and from 0%

to 16% for equity issues. As expected, an equity investment requires a higher IRR and higher setup costs than debt but lower collateral as well. The ultimate purpose of this paper is to determine the technical features of the SIBs that most attract institutional investors, so it is particularly meaningful to match the considerations drawn from Table 3 with the specification of the actors that took part in the deals that are closed so far. Table 4 shows the percentages of debt and equity allocated to institutional investors, charities, foundations, NPOs and to a residual category of actors.

**Table 3. SIBs Providers' Contributions**

Financing	Inst. Investors	Foundations	NPOs	Charities	Other
Total	56.84%	27.97%	2.85%	2.32%	8.56%
<i>N</i>	66	66	66	66	66
Debt	60.77%	31.49%	2.26%	0.85%	4.69%
<i>N</i>	39	39	39	39	39
Equity	61.00%	19.90%	4.76%	3.34%	11.05%
<i>N</i>	21	21	21	21	21

*Source: SIBS disclosed documentation, authors' calculations*

Given the conditions summarized in Table 3, 60% of the debt issued with the SIB mechanism is allocated to institutional investors. Foundations rank second, with a participation of 31.5% and 20% for debt and equity, respectively, whereas the contribution of other NPOs and charities is residual.

The descriptive statistics provided in Tables 3 and 4 present the characteristics of the SIBs issued so far and the distribution of the providers' participation, but in order to match these two aspects and to identify the drivers of the institutional investors' participation, a multivariate empirical analysis is necessary.

## 4. Models and Results

To identify the determinants of institutional investors' participation, we regress the variable *Institutional Share* against three sets of explanatory variables, as exemplified in equation 1.

$$Inst_{Share} = \alpha + \beta_1 Financials + \beta_2 Contractual + \beta_3 Social Issue + \varepsilon \quad (1)$$

The dependent variable assesses the percentage of institutional investors' participation out of the whole gathered capital, as shown in Table 5, column 1, and the probability for the institutional investors' participation to be higher than 60% of the issue, as shown in column 2.

**Table 4. Determinants of Institutional Investors' Participation**

*This table presents the results of the estimation of a linear (1) and a probit (2) regressions on the full sample. The dependent variable of model 1 is the percentage of the total capital raised by a SIB issue subscribed by institutional investors, the dependent variable of model 2 is a categorical variable that takes the value of 0 if the institutional investors' participation is lower than 31%, 1 if the participation is between 31% and 60% and 2 otherwise. Amount is the of the size of the issue, expressed in millions of Euros. Maturity is the number of years of the issue. Equity is a dummy variable that takes value 1 in case of an equity issue, zero otherwise. Debt is a dummy variable that takes value 1 in case of a debt issue, zero otherwise. IRR is the internal rate of return. Secured is the % of the amount guaranteed by a collateral. Providers is the number of financing institutions. Fee is the overall cost of the issue in % of the amount. SPV is a dummy variable that takes value 1 in case of a SPV issue, zero otherwise. Providers is the number of financing institutions. Local is a dummy variable that takes value 1 in case the PA of the SIB is Local (regional, municipal), zero otherwise.*

	Institutional Share (1)	Institutional Tertile (2)
<i>Financials-Features</i>		
Amount	0.010 (0.009)	0.019** (0.009)
Maturity	0.092*** (0.034)	0.100* (0.057)
Equity	0.287** (0.127)	0.347** (0.149)
Debt	0.511*** (0.108)	0.597*** (0.136)
IRR	0.009** (0.004)	0.010** (0.004)
% Secured	-0.137 (0.107)	-0.194* (0.103)
Fee	0.008 (0.010)	0.016 (0.011)
<i>Contractual Features</i>		
SPV	0.130 (0.126)	0.161 (0.183)
#Providers	-0.079*** (0.016)	-0.108*** (0.022)
Local	0.400*** (0.125)	0.474*** (0.148)
<i>Social Issue</i>		
Education	0.252* (0.138)	1.221*** (0.200)
Family	0.407* (0.138)	1.397*** (0.200)



	(0.222)	(0.296)
Health	0.310*	1.184***
	(0.176)	(0.198)
Housing	0.505***	1.454***
	(0.137)	(0.216)
Recidivism	0.690***	1.517***
	(0.181)	(0.257)
Employment	0.221	1.083***
	(0.173)	(0.271)
UK	0.242*	0.238*
	(0.135)	(0.134)
Observations	64	64
(Pseudo) R2	0.616	0.3781

The superscripts \*\*\*, \*\*, and \* denote coefficients statistically different from zero at the 1%, 5%, and 10% levels, respectively, in two-tailed tests. The standard errors reported in parentheses are clustered at SIB level. VIF and Link test are performed and passed.

The first set of explanatory variables identifies the financial characteristics of the issue: the amount, the maturity, the technical form of the issue, the rate of return offered in case of success, and the percentage of investment guaranteed by collateral (see Table 5). *Contractual features* identify the presence of a special purpose vehicle, the number of shareholders taking part in the deal, and whether the SIB has been organized by a local public authority. The dummy variables comprised in the *Social Area* bucket control for the area of intervention addressed by the SIB and whether the SIB is set up in the UK. This last variable captures a sort of first-mover advantage, as the UK has been the first country to issue SIBs.

Three different statistical approaches are employed to test these relationships. The baseline model uses linear regression (see column 1, Table 5), in which the percentage of the Institutional Investors' participation to the SIB's capital is regressed against the numerous explanatory variables mentioned above. As the *Institutional Share* is a censored variable, we run a Tobit estimation, obtaining qualitatively comparable results (see Table A.2 in the Appendix).

The positive and significant coefficient of *maturity* is an expected result from both a technical and operational point of view. The SIB can be interpreted as a call option on the final value of the project. Therefore, according to the financial theory, the longer an option has until expiration, the

greater the chance that it will be profitable and, consequently, the higher its value. Moreover, the nature of the project funded via SIBs is on average highly risky, and a call option's underlying volatility is a factor in time value; if we apply this financial principle to the SIB contracts, the harder it is to predict the outcome of the social project and the higher the time-value of the SIB. From an operational perspective, the social projects financed with an SIB issuance require some time to take effect, so institutional investors may prefer to take part in medium- to long-term projects. Overall, the maturity of the SIBs issued so far spans from 1 to 8 years, but the minimum length of a social project funded by institutional investors is three years. The impact of the technical form of the issue on the percentage of capital subscribed by institutional investors is in line with our expectations. Being risk-averse and coherent with the financial purpose of their intervention, institutional investors' preference for *debt* exceeds *equity* in both magnitude and significance; we performed a Wald test, and the difference between the two coefficients is statistically significant. The relationship between interest rate and institutional investment is almost symmetrical: a 1% increase in the interest rate increases the percentage of investment by 0.9%; this result provides empirical support to the sensitivity of private investors on the rate of return offered in case of success, which was already identified by Jackson (2013). The results reported in Table 5 and A.2 show that the presence of collateral and its incisiveness does not influence the share of institutional investor participation; this result is rather unexpected, according to Warner (2013). However, in the standard financial theory, the yield of return and the collateral are substitutes, and this seems to apply to SIB deals as well. Moreover, this result finds its rationale in the nature of the collateral effectively offered by the SIB organizer, which cannot be financial assets, as usually occurs in financial deals.

The *SIB structure* set of controls shows that institutional investors prefer a limited number of stakeholders and supervision by local public authorities. The latter result is coherent with the results of a study carried out in the United States by Van Slyke (2006), who found evidence that local public authorities are more risk-averse than central public authorities. 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 would most likely be successful. This informative proximity can potentially decrease the uncertainty of the social project's outcome and is highly valued by institutional investors.

The coefficients of the social areas of intervention have to be compared to immigration projects in order to be correctly interpreted. Housing and recidivism, in particular, are the social areas that increase the share of participation of institutional investors in comparison to immigration by 50% and 69%, respectively. Projects addressing education, family, and housing issues are more likely to be targeted by institutional investors as well, but their coefficients are rather weakly significant. The very strong preference accorded to housing and recidivism projects can be explained both by the quantitative, objective metrics employed to measure the success of such intervention plans and the medium term required to test their efficacy, which is a shorter time period than projects addressing health or family issues.

As a robustness check, we collapsed the percentage of capital subscribed by institutional investors into three groups ( $\leq 30\%$ ;  $30\% - 60\%$ ;  $\geq 61\%$ ), and with an ordered probit model we investigate what encourages them to participate heavily (i.e., with a share of more than 60% of the total capital raised) in an SIB issue (see Table 5, column 2). The results are qualitatively comparable to the baseline model, which is reported in the first column of Table 5. One economically meaningful difference regards the amount of the issue. According to the results reported in Table 5 - model 2, the size of the issue positively affects the probability of an institutional investor to participate with a share of more than 60% of the overall capital required by the project. Apparently, institutional investors are attracted by sizable projects that may proxy for the soundness of the SIB structure and, consequently, for the control mechanisms setup.

## Conclusion

SIBs are a financial tool that could help both NPOs and PAs to finance innovation in the social fields. NPOs could benefit from this new source of funding both in terms of finance diversification and risk reduction since the SIBs investors face the projects' risk. PA is asked to pay a premium only in the case of the projects' success, rebating a portion of cost reduction to the investors. Notwithstanding these good premises, SIBs diffusion is quite limited. Institutional investors are the key for success, but SIBs failed to significantly attract their interest thus far. We empirically examine successfully implemented SIBs and try to understand the factors that most attract institutional investors. From the theoretical background, some studies noted that the excessive risk and the complexity of the contracts are the main factors that discourage institutional investors. Collecting both financial and contractual data of the SIBs implemented worldwide, we find that the main limitation seems to be related more on the contractual features rather than on the financial conditions of the contract. As expected, we find that investors are more likely to participate in SIBs with a lower asymmetry of information and agency problems. The presence of several other investors has a negative impact because of the higher free riding problems in terms of both project valuation and monitoring activities. In contrast, the presence of local PAs increases the likelihood of an institutional investor's participation: a local PA has more incentives to correctly monitor the project than a central PA, thus reducing agency problems. On the other hand, the type of SIB underlying social issue plays a key role in reducing information asymmetries. Social issues, such as recidivism or social housing, represent a field with easier and widely accepted social impact measures that helps to mitigate the information asymmetry between investors and NPOs. Financial conditions respect the risk–return relationship, so higher IRRs are expected, depending on the riskiness of the project. In conclusion, SIBs could be successfully implemented if the contractual relationships were designed in such a way as to reduce both agency problems and information asymmetries among the players involved.

## References

- Abzug, R. & Webb, N. 1999, "Relationships between Nonprofit and for-Profit Organizations: A Stakeholder Perspective", *Nonprofit and Voluntary Sector Quarterly*, vol. 28, no. 4, pp. 416-431.
- Adam, T. & Lingelbach, G. 2015, "The Place of Foundations and Endowments in German History: A Historical-Statistical Approach", *Nonprofit and Voluntary Sector Quarterly*, vol. 44, no. 2, pp. 223-247.
- Baliga, S. 2013, "Shaping the success of social impact bonds in the United States: lessons learned from the privatization of U.S. prisons", *Duke Law Journal*, vol. 63, no. 2, pp. 437.
- Beisland, L. & Mersland, R. 2012, "An Analysis of the Drivers of Microfinance Rating Assessments", *Nonprofit and Voluntary Sector Quarterly*, vol. 41, no. 2, pp. 213-231.
- Bowman, W., Tuckman, H. & Young, D. 2012, "Issues in Nonprofit Finance Research: Surplus, Endowment, and Endowment Portfolios", *Nonprofit and Voluntary Sector Quarterly*, vol. 41, no. 4, pp. 560-579.
- Calabrese, T. 2012, "The Accumulation of Nonprofit Profits: A Dynamic Analysis", *Nonprofit and Voluntary Sector Quarterly*, vol. 41, no. 2, pp. 300-324.
- Calabrese, T.D. & Ely, T.L. 2016, "Borrowing for the Public Good: The Growing Importance of Tax-Exempt Bonds for Public Charities", *Nonprofit and Voluntary Sector Quarterly*, vol. 45, no. 3, pp. 458-477.
- Clifford, J. 2017, "Social Impact Bonds", *Routledge handbook of social and sustainable finance*, , pp. 161-176.
- David Butler, Dan Bloom & Timothy Rudd, M. *Using Social Impact Bonds to Spur Innovation, Knowledge Building, and Accountability*.
- Godeke, Steven, and Lyel Resner. "Building a Healthy & Sustainable Social Impact Bond Market: The Investor Landscape." *New York: Godeke Consulting and The Rockefeller Foundation* (2012).
- Hughes, P. & Luksetich, W. 2008, "Income Volatility and Wealth: The Effect on Charitable Giving", *Nonprofit and Voluntary Sector Quarterly*, vol. 37, no. 2, pp. 264-280.
- Jackson, E.T. 2013, "Evaluating social impact bonds: questions, challenges, innovations, and possibilities in measuring outcomes in impact investing", *Community Development: Journal of the Community Development Society*, vol. 44, no. 5, pp. 608.
- Joy, Meghan, and John Shields. "Social Impact Bonds: The Next Phase of Third Sector Marketization?." *Canadian journal of nonprofit and social economy research* 4.2 (2013): 39.
- Lee Harper, P N A PNA, ing community center in Seattle, WA. She is also an adjunct faculty member at Seattle University's Institute of Public Service, instructing courses in nonprofit management to both graduate & undergraduate students. *Reviewer Biography*.

- Ostrander, S. 2007, "The Growth of Donor Control: Revisiting the Social Relations of Philanthropy", *Nonprofit and Voluntary Sector Quarterly*, vol. 36, no. 2, pp. 356-372.
- Ott, J.S. 2016, *Understanding nonprofit organizations*, 3. ed. edn, Westview Pr, Boulder, Colo.
- Prentice, C.R. 2016, "Why So Many Measures of Nonprofit Financial Performance? Analyzing and Improving the Use of Financial Measures in Nonprofit Research", *Nonprofit and Voluntary Sector Quarterly*, vol. 45, no. 4, pp. 715-740.
- Reviewed by:, D A C, D P A P, Athens, GA & USA DOI: 10.1177/0899764012441514 *Bowman, W. (2011). Finance Fundamentals for Nonprofits: Building Capacity and Sustainability. Hoboken, NJ: John Wiley. 212 pp..*
- Shea, J. & Wang, J.Q. 2016, "Revenue Diversification in Housing Nonprofits: Impact of State Funding Environments", *Nonprofit and Voluntary Sector Quarterly*, vol. 45, no. 3, pp. 548-567.
- Shields, J. 2013, "Nonprofit engagement with provincial policy officials: The case of Canadian immigrant settlement services". Paper presented at the 1st International Conference on Public Policy, Grenoble, France.
- Social Finance 2011, November. Reducing reoffending among short sentenced male offenders from Peterborough prison. London, U.K.: Social Finance
- Struthers, M. 2013 "Fair exchange: Public funding for social impact through the non-profit sector" Toronto, ON: Metcalf Foundation.
- Von G. D. & Whistler, C. 2011 "Pay for success programs: An introduction." Policy and Practice, 19 - 22
- Ward, S., Scanlon, T. & Hines, T. 2013, "Mutuality Ownership Form and Professional Sports: Football", *Nonprofit and Voluntary Sector Quarterly*, vol. 42, no. 4, pp. 763-780.
- Warner, M.E. 2013, "Private finance for public goods", *Journal of economic policy reform*, vol. 16, no. 4, pp. 303-319.
- Young, D.R. 2000, "Alternative Models of Government-Nonprofit Sector Relations: Theoretical and International Perspectives", *Nonprofit and Voluntary Sector Quarterly*, vol. 29, no. 1, pp. 149-172.

# Appendix

## A.1 Variable definition

<b>VARIABLE</b>	<b>DEFINITION</b>
<b><i>Contextual Variables</i></b>	
Name	Name of the SIB
Country	Country of issuance
<b><i>Financials</i></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
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.
Fee	Cost of the issue, %
<b><i>Contractual Features</i></b>	
Central	Dummy variable that takes the value of 1 if the public authority that organises the SIB is centralised and 0 otherwise
Local	Dummy variable that takes the value of 1 if the public authority that organises the SIB is local and 0 otherwise
SPV	Presence of a special purpose vehicle
#Providers	Number of underwriters taking part to the deal
Institutional share	Institutional investors' participation to the SIB issue, %
Institutional tertile	Categorical variable taking the value of 0 if the institutional investors' participation is lower than 31%, 1 if the participation is between 31% and 60% and 2 if it is higher than 60%
<b><i>Social Issue</i></b>	
Education	Dummy variable that takes the value of 1 if the SIB addresses education issues, 0 otherwise
Family	Dummy variable that takes the value of 1 if the SIB addresses problematic domestic situation, 0 otherwise
Health	Dummy variable that takes the value of 1 if the SIB addresses sanitary issues, 0 otherwise
Housing	Dummy variable that takes the value of 1 if the SIB addresses homelessness issues, 0 otherwise
Recidivism	Dummy variable that takes the value of 1 if the SIB addresses crime recidivism issues, 0 otherwise
Employment	Dummy variable that takes the value of 1 if the SIB addresses unemployment issues, 0 otherwise
Immigration	Dummy variable that takes the value of 1 if the SIB addresses immigration issues, 0 otherwise

**Table A.2:****Determinants of Institutional Investors' Participation**

	Inst. Share (1)
<i>Technical Features</i>	
Amount	0.011 (0.010)
Maturity	0.112** (0.045)
Equity	0.285** (0.132)
Debt	0.650*** (0.139)
IRR	0.012** (0.006)
% Secured	-0.127 (0.146)
Fee	0.004 (0.012)
<i>SIB Structure</i>	
Local	0.548*** (0.156)
SPV	0.165 (0.162)
Providers	-0.116*** (0.022)
<i>Areas of Intervention</i>	
Education	0.290* (0.160)
Family	0.490* (0.255)
Health	0.392** (0.190)
Housing	0.634*** (0.166)
Recidivism	0.957*** (0.245)
Employment	0.263 (0.204)
UK	0.422** (0.167)
Observations	64
R2	0.5257

This table presents the results of the estimation of a Tobit model with a right censoring limit. The dependent variable of the model is the percentage of the total capital raised by a SIB issue subscribed by institutional investors. The superscripts \*\*\*, \*\*, and \* denote coefficients statistically different from zero at the 1%, 5%, and 10% levels, respectively, in two-tailed tests. The standard errors reported in parentheses are clustered at SIB level. VIF and Link test are performed.