A Theory of Social Impact Bonds

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Social Impact Bonds (SIB) are a new mechanism for financing public goods, especially social spending.

In this talk I will:
- Define and describe a SIB
- Provide a detailed example
- Present a model of their value added over debt finance
What is a Social Impact Bond?

According to Social Finance (SIB Broker)

▶ “SIBs provide investment to fund social interventions. If the targeted social outcome improves, the outcome payer repays the investors for their initial investment plus a predetermined return.”
First Social Impact Bond: Peterborough (UK) 2010

Social Intervention

- Support male inmates while in prison and post-release with the aim of reducing reoffending.

Investors

- 16 Charitable trusts: Barrow Cadbury, J Paul Getty, Rockefeller

Outcome Metric

- Reduce recidivism by 7.5%. Average across 3 distinct, 1,000 prisoner cohorts.

Outcome payer

- UK Ministry of Justice via the Big Lottery Fund.

Results

- 9% Reduction in recidivism compared to matched control.
- Principle investment plus 3% annual return.

Assessor

- RAND. Use PSM with control group from other prisons.
SIBs in Progress

Ongoing SIB Projects

- 2010: 1
- 2011: 1
- 2012: 10
- 2013: 20
- 2014: 31
- 2015: 50
- 2016: 80
- 2017: 100
- 2018: 100
- 2019: 100

Proprietary & Confidential
Most SIBs are focused on relatively short-term programs, e.g.
- Workforce Development (31%)
- Homelessness (17%)
- Child & Family Welfare (15%)

Only 17% of existing SIBs focus on health.
Possible explanation:
- 95% of SIBs are in high-income countries where a lack of health programs is less of an issue.
- Possible explanation:
  Full benefits of a health program may take a long time to materialize.
Global Investment Level

Note: dollar amounts not yet available for SIBs launched in 2019.
The government is considering financing the following project:

Cost: $C$

Time 1

Assume $\frac{p^*b}{c} > 1$

Time 2

Good $\rightarrow b$

Bad $\rightarrow 0$

$p^*$

$1-p^*$
Model: Preferences

Investor

- required return $r - \omega$
- $r$ is return on comparable debt
- $\omega$ is possible social impact discount
- risk neutral
- subjective probability of success $p$

Government

- Maximizes Expected Utility
- $U = PV(\text{Benefits}) - PV(\text{Costs}) - \phi PV(\text{Unfunded Costs})$
- Unfunded costs are costs paid in excess of offsetting benefits.
- Discount rate $r$
- subjective probability of success $q$
**Model: Financial Instruments**

*Debt finance*

- Government pays the investor $c(1+i)$ in each state.
- $i$ is the interest rate on the debt contract.

*Social impact bond (SIB)*

- Government pays pre-specified values:
  - $c^g_2 \geq 0$ in the good state
  - $c^b_2 \geq 0$ in the bad state
- We require that $c^g_2 \geq c^b_2$. 
A financing instrument is:

**Investor Incentive Compatible** if:

\[ E(r) \geq r - \omega \]

**Government Incentive Compatible** if:

\[ E(U) \geq 0 \]

Project is *implementable*, given the financing instrument, if both investor and government incentive compatible.
Result 1: Debt Implementability

A debt contract can implement the project if and only if:

\[
\frac{qb}{c[1 + \phi(1 - q)]} \geq (1 + r - \omega)
\]

- Preference for avoiding unfunded costs (\(\phi\)) creates wedge between profitable projects and the interest rate.
- Only the government’s beliefs matter.
Result 2: SIB Implementability

A social impact bond can implement the project if:

$$\frac{b}{c} > (1 + r - \omega)$$

- SIB eliminates bad state payment and hence unfunded costs.
- Investor compensated with higher return in the good state.
- Only the investor’s beliefs matter
- When $p \geq q$, then this condition holds for any project implementable with a SIB
Result 3: Debt and SIB Equivalency

When

- The government doesn’t care about unfunded costs, $\phi = 0$.
- And $p \leq q$

Then

- SIB Implementability $\iff$ Debt Implementability
Beliefs and Implementability

Parameters: $\phi = 0$, $\frac{b}{c} = 1.4$, $r - \omega = 0.08$
Unfunded Costs Aversion and Implementability

Parameters: $\frac{b}{c} = 1.4$, $r - \omega = 0.08$, $p = q$
Conclusion

- SIBs are an innovative funding mechanism for public goods.
  - Background and summary statistics
  - Model comparing it to debt finance
- Should be considered when debt finance rejected
- Extensions
  - Risk averse investors
  - Transaction costs
  - Model political friction
  - Imperfect indicators of state
  - Government moral hazard
  - Variable effort