A Theory of Social Impact Bonds

Daniel L Tortorice (joint w/ David Bloom, Paige Kirby and John Regan)

Department of Economics and Accounting
College of the Holy Cross

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Introduction

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

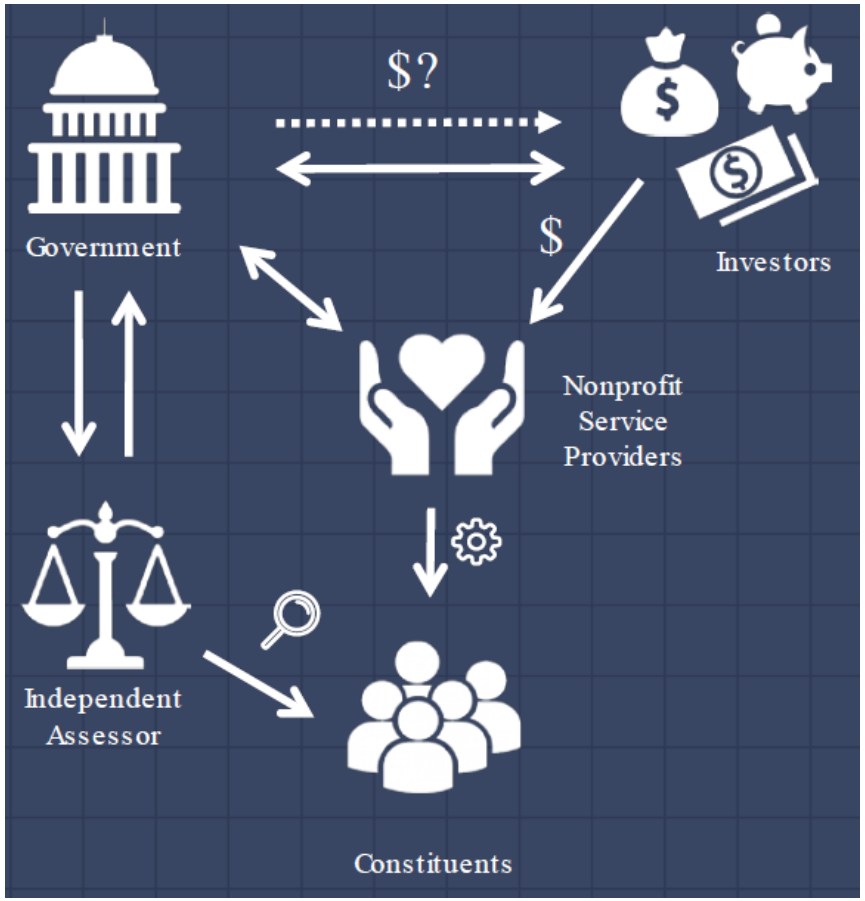
In this talk I will:

- 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.

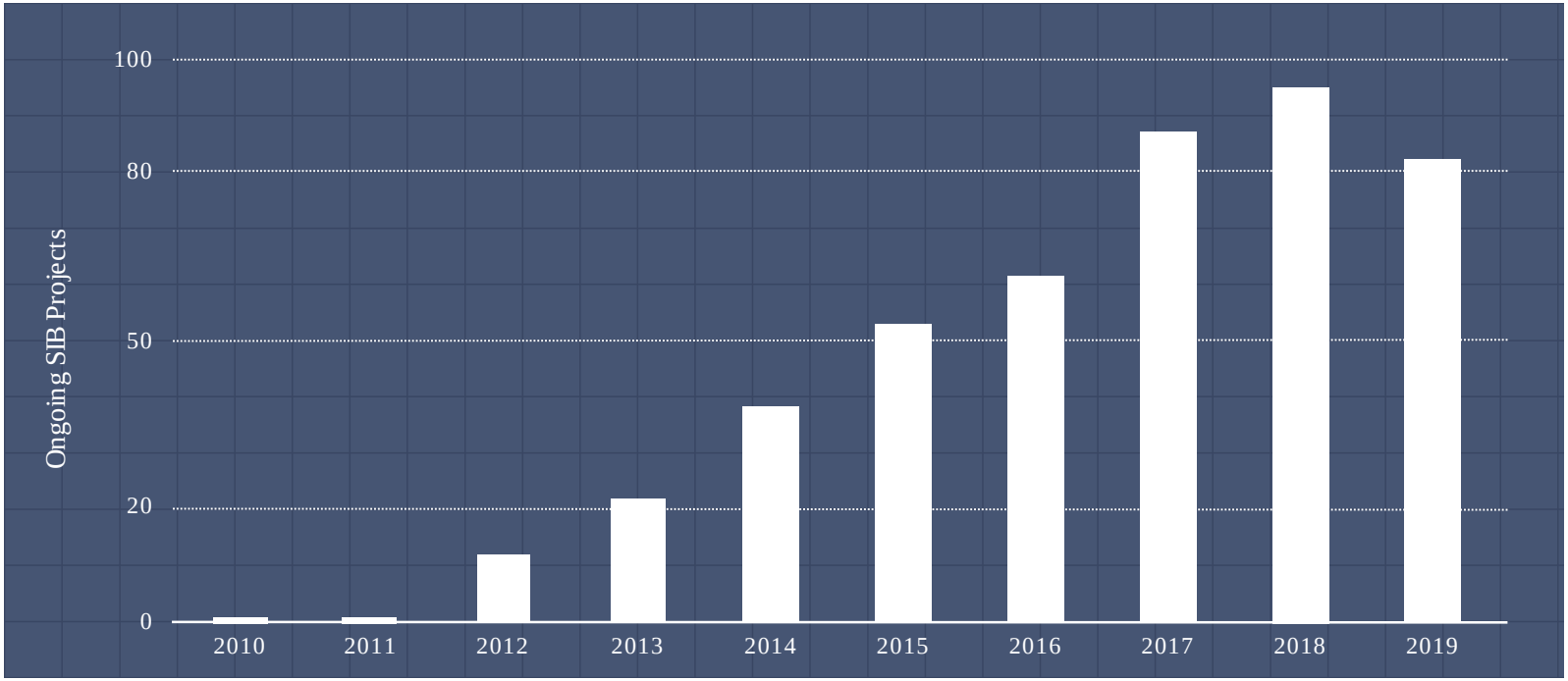
Results

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

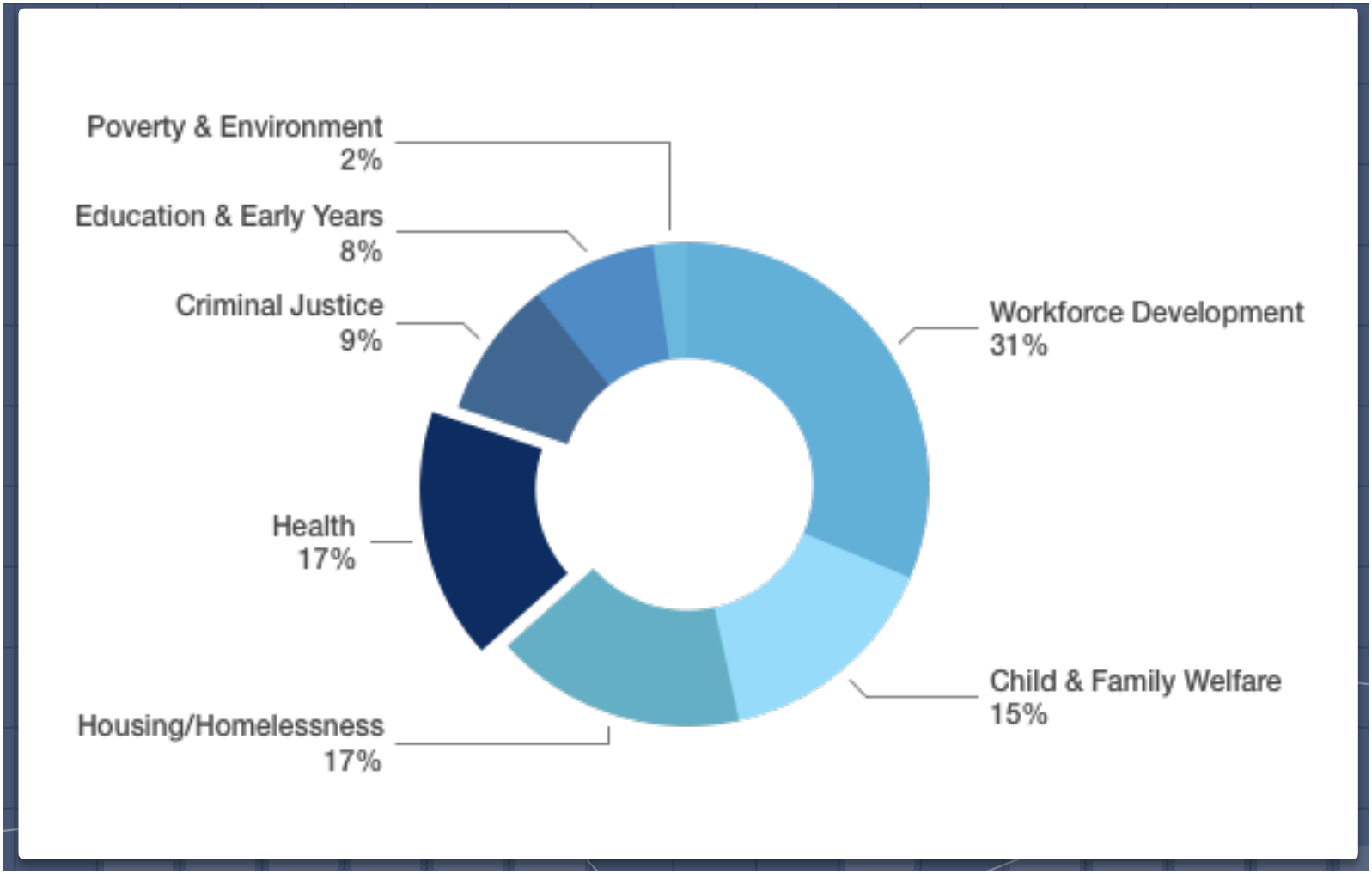
Assessor

- RAND. Use PSM with control group from other prisons.

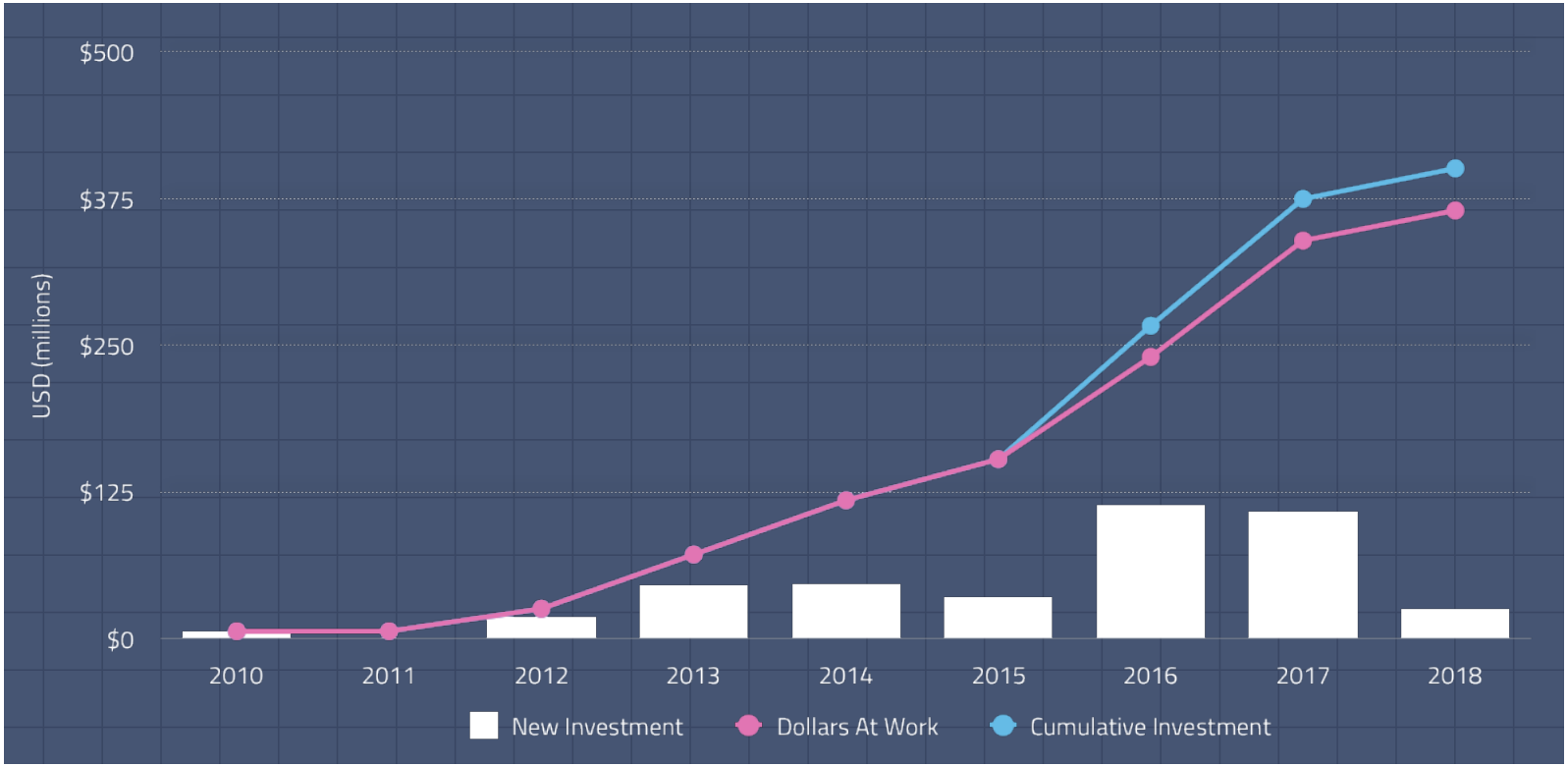
SIBs in Progress



SIBs Issue Areas

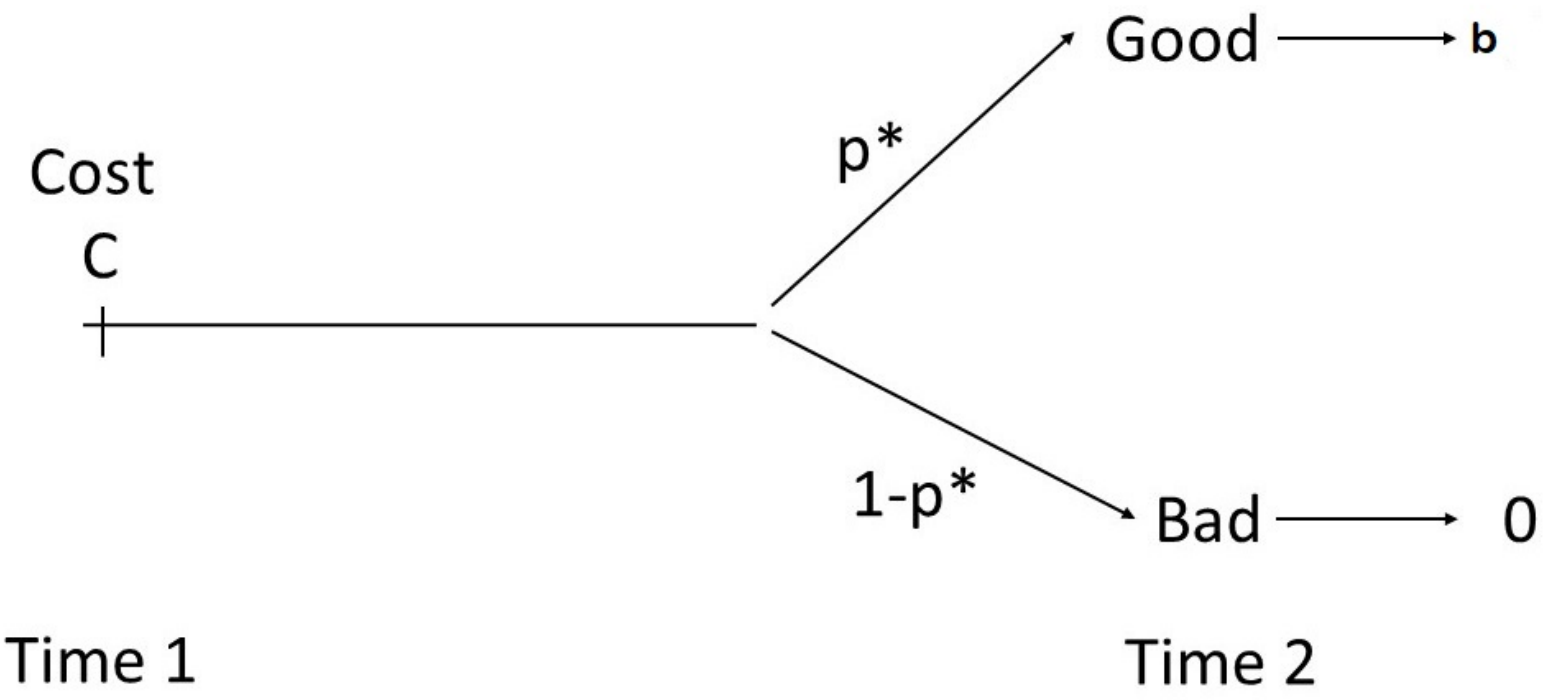


Global Investment Level



Model:Project

The government is considering financing the following project:



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

Model: Preferences

Investor

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

Government

- Maximizes Expected Utility
- U=PV(Benefits)-PV(Costs)-ϕPV(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:
  - $c_2^g \geq 0$ in the good state
  - $c_2^b \geq 0$ in the bad state
- We require that $c_2^g \geq c_2^b$.

Model: Incentive Compatibility and Implementability

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 (ϕ) 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:

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

- 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

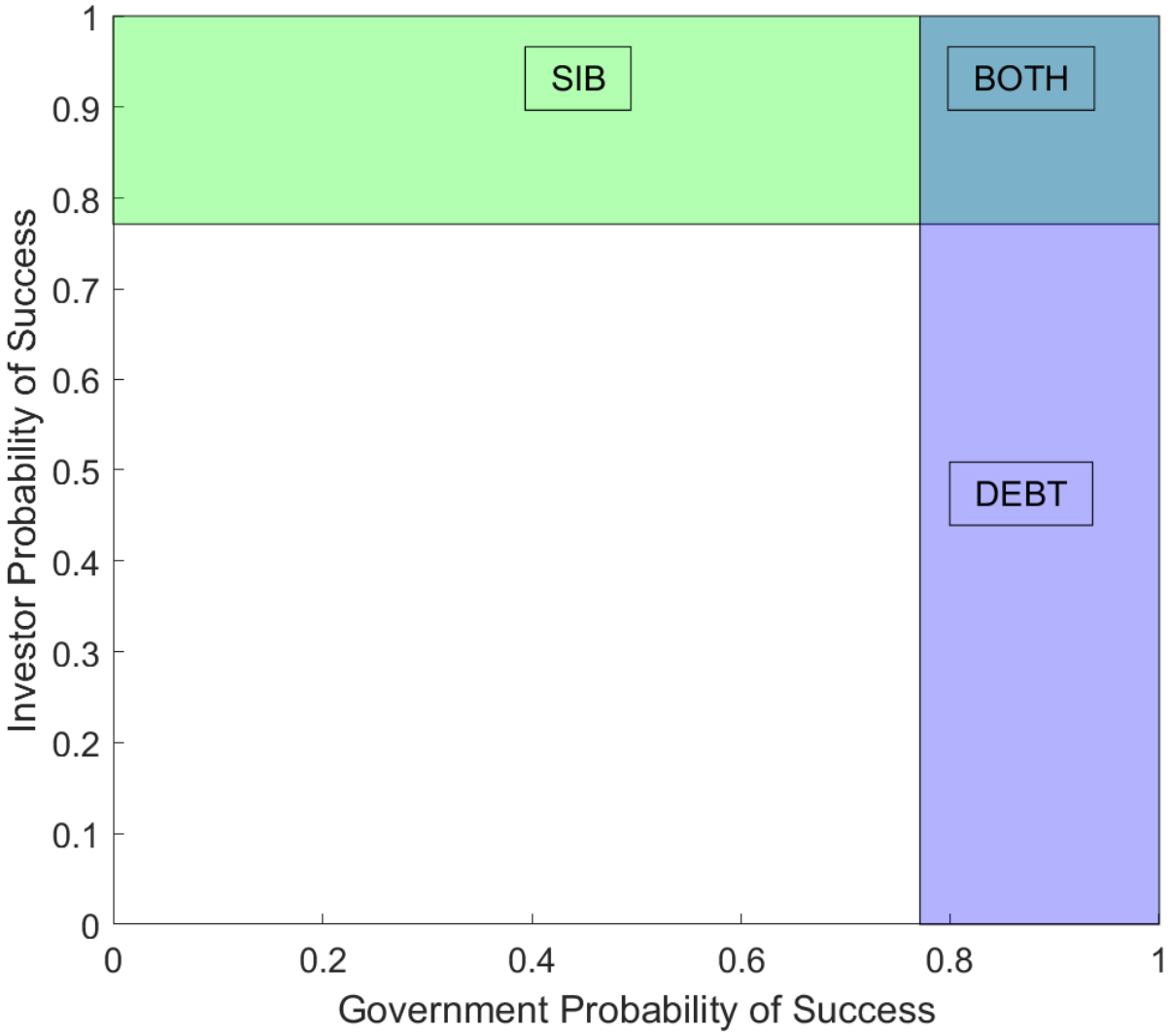
When

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

Then

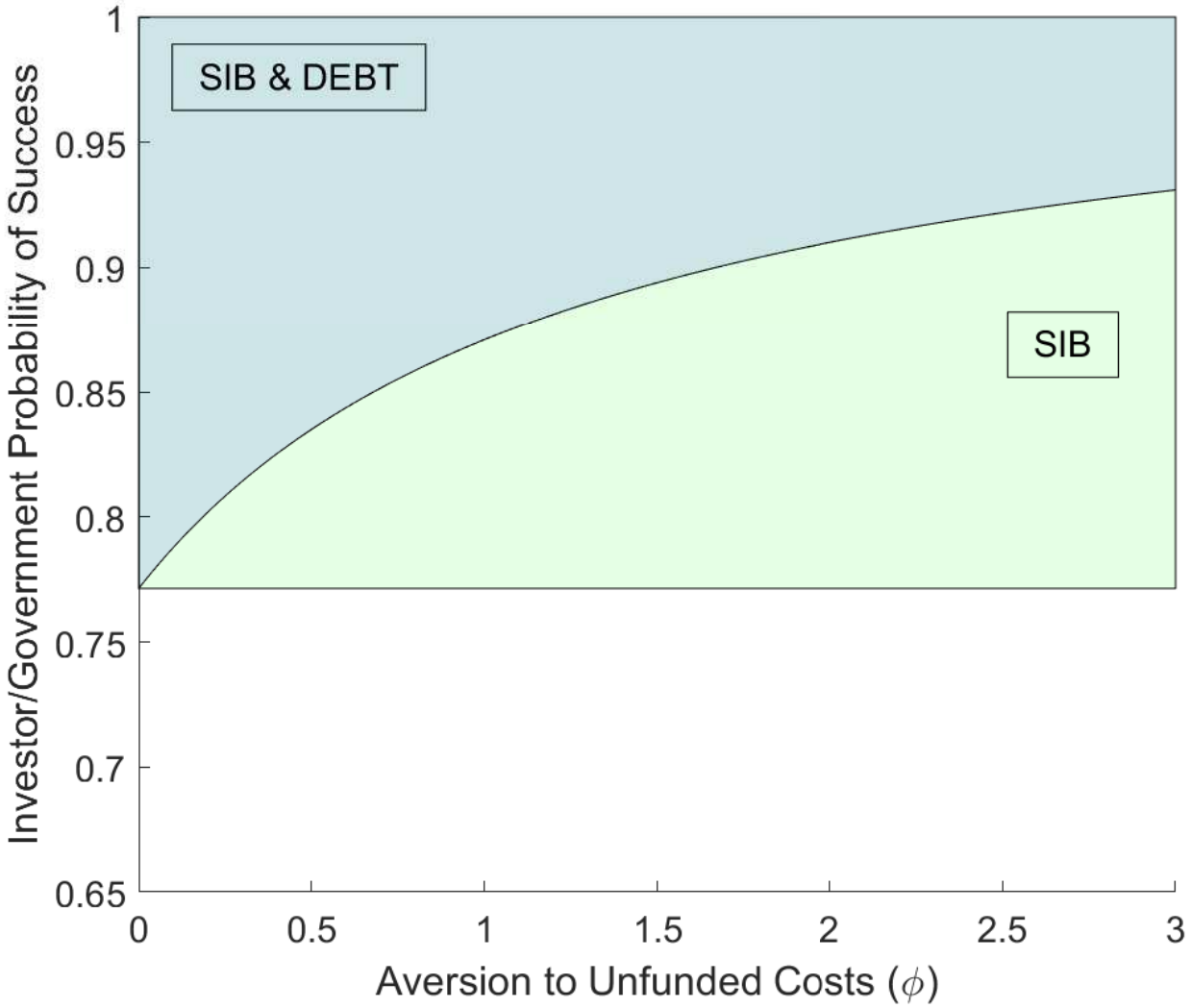
- SIB Implementability $\Leftrightarrow$Debt Implementability

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