Operationalizing a cost-benefit analysis for a federal loan-guarantee program:

Insights from the Canadian Small Business Financing Program

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Purpose and scope of the presentation

- This presentation describes how a cost-benefit analysis (CBA) was operationalized for the Canada Small Business Financing Program (CSBFP).
- The content is based on the most recent CSBFP cost-benefit analysis (covering multiple fiscal years).
- The focus is on:
  - Analytical framework
  - Data sources
  - Modelling choices
  - Key assumptions and limitations
- Results are included only to illustrate methodology, not to draw policy conclusions.

Canada Small Business Financing Program (CSBFP): scope and scale

- The CSBFP is a federal loan guarantee program designed to improve access to financing for SMEs by sharing lending risk with private financial institutions.
- Been in operation since 1999 and governed by the Canada Small Business Financing Act.
- The GOC guarantees up to 85% of eligible loan losses, while lenders retain responsibility for loan approval and administration.
- Over recent evaluation periods, the CSBFP has supported:
  - Thousands of loans per year (7,000-10,000 annually)
  - Annual loan volumes close to or exceeding $1 billion
  - Financing primarily used for property, equipment, and leasehold improvements
- Due to the size, maturity, and stability of the program, the CSBFP is well suited to retrospective, multi-year cost-benefit analysis.
- Under central assumptions, estimated economy-wide benefits exceed program costs.

Why CSBFP works well for a methods-focused CBA

- The CSBFP is a long-standing federal loan-guarantee program delivered through private lenders.
- Program objectives and delivery mechanisms have remained broadly stable over time.
- Administrative data are available on:
  - Loan volumes and characteristics
  - Claims and defaults
  - Program administration costs
- These features make it possible to observe both costs and benefits over multiple years.

Evaluation cycle and multi-year analysis window

- CSBFP cost-benefit analysis are conducted on a five-year evaluation cycle, consistent with statutory requirements.
- Data coverage by evaluation
  - Foundational CBA (KPMG, 2009) covers fiscal years 1999 - 2000 to 2007 - 2008
  - 2015 CBA (Seens) covers fiscal years 2003 - 2004 to 2011 - 2012
  - 2019 CBA (Huang & Rivard) covers fiscal years 2008 - 2009 to 2016 - 2017
  - 2024 CBA (Durodola) covers fiscal years 2013 - 2014 to 2021 - 2022
- Each CBA covers multiple fiscal years, rather than a single year.
- A multi-year window allows sufficient time for:
  - Loans to mature
  - Defaults and claims to materialize
  - Economic impacts to be realized
- Shorter evaluation windows would risk understating both costs and benefits.

Evaluation question and analytical perspective

- Primary question: Does the CSBFP generate net social benefits?
- Perspective: society-wide capturing:
  - Government costs
  - Private sector costs
  - Economy-wide benefits
- The analysis is retrospective, using observed outcomes.
- Counterfactual: financing activity without the program
- Key concept: incrementality

Methodological continuity across CSBFP Cost-benefit analyses

- The CSBFP CBA framework was established in early evaluations and preserved in subsequent studies.
- Core elements maintained across cycles include:
- Social (economy-wide) perspective
- Incrementality-based counterfactual
- Use of Input–Output (IO) modelling
- Present value metrics (PVNB) and Benefit-Cost Ratio (BCR).
- Updates reflect improved data and modelling capacity rather than changes in analytical philosophy.

Methodological framework: costs and benefits

- The CSBFP cost-benefit analysis:
  - measures program costs and benefits over multiple years
  - adjusts benefits for incrementality, and
  - aggregates results using present value metrics

Measuring Program cost

- Costs capture all resources used because the CSBFP exists, regardless of whether they are borne by government or private sector
- Costs are measured in the year they occur and include:
  - Government administrative costs (staff, operations, capital)
  - Claims paid on loan defaults
  - Loan default costs borne by lenders
  - Timing of claims (lags)
- Claims typically occur several years after loan issuance, reflecting program dynamics.

Benefit components

- Benefits reflect economic flows attributable to CSBFP-supported activity:
  - GDP impacts from borrower investment
  - Employment and wages
  - Profits earned by lenders
  - Registration and administration fees paid to government
- Benefits are measured net of incrementality assumptions.

Incrementality: attributing outcomes to the program

- Incrementality defines what portion of observed financing activity is attributable to the CSBFP.
- It represents the counterfactual: what would have occurred without the program?
- Loans are classified conceptually as:
  - Fully incremental: would not exist without CSBFP
  - Partially incremental: would exist at a smaller amount or under more restrictive terms
  - Non-incremental: would exist on the same terms without CSBFP

Applying incrementality assumptions: 2024 CSBFP example

- Incrementality cannot be directly observed in administrative data.
- Previous incrementality studies estimate that approximately *69–76%* of CSBFP loans are incremental, meaning they would not have occurred in the absence of the program.[1]
- In the 2024 CBA:
  - Fully incremental loans are counted at 100% of observed value.
  - Partially incremental loans are modelled at 50% of observed loan value.
  - Non-incremental loans are excluded from benefit attribution.
- These adjustments are applied before estimating GDP, employment, and profit impacts.
- Sensitivity analysis varies the share of loans in each category.

1. Innovation, Science and Economic Development Canada (ISED), Incrementality Study of the Canada Small Business Financing Program (2018), and subsequent evaluations.

Data sources and integration

- The CSBFP CBA relies primarily on existing administrative and statistical data:
  - CSBFP administrative loan database
  - ISED financial management systems
  - Statistics Canada Input-Output tables
  - Bank of Canada interest rates
  - Previous CSBFP analytical studies

From loans to GDP: Input-Output (IO) modelling

- CSBFP loan spending is allocated by asset categories
  - (e.g., equipment, real property, lease improvements)
- Asset types are mapped to commodities in the IO framework.
  - *Example: Equipment purchased by a bakery (e.g., commercial ovens, mixers) is mapped to machinery-related commodities*
- The IO model estimates:
  - Direct GDP impacts

    Value added generated by machinery manufacturers producing bakery equipment
  - Indirect GDP impacts through supply chains

    Metal fabrication, electronic components, transportation, business services
- Adjustments are made to avoid double counting, particularly for existing assets and transactions that do not generate new production in current period

Cost-benefit framework

- Net social benefit is calculated as the difference between benefits and costs over time.
- Two summary metrics are used:
- Present Value Net Benefit (PVNB)

$$PVNB = \sum_{t=-k}^{0} \frac{B_t - C_t}{(1+r)^t}$$

- Benefit-Cost Ratio (BCR)

$$BCR = \frac{\sum_{t=-k}^{0} \frac{B_t}{(1+r)^t}}{\sum_{t=-k}^{0} \frac{C_t}{(1+r)^t}}$$

- Results are summarized using PVNB and BCR

Time aggregation and discounting

- The CSBFP CBA is retrospective
- Past costs and benefits are compounded forward to a common reference year using real discount rates consistent with federal guidance
- Multiple discount rates are used to:
  - Align with federal guidance
  - Support sensitivity analysis
  - Preserve comparability across studies

Testing robustness

- Sensitivity analysis focuses on key sources of uncertainty:
  - Incrementality assumptions
  - Discount rate
  - Three scenarios are reported: High, medium, and low
- Results are interpreted as ranges, not precise point estimates

Transferability and lessons

- Some costs and benefits excluded due to data limitations.
- Opportunity cost assumptions are explicitly defined.
- Claims timing introduces lags and uncertainty.
- The CSBFP framework is modular and transferable, but incrementality and benefit channels must be reassessed for each program.

CSBFP Cost-Benefit Analyses: Reference Reports

- Cost-Benefit Analysis of the Canada Small Business Financing Program - Jan 2015
- Canada Small Business Financing Program: Cost-Benefit Analysis - May 2019
- Canada Small Business Financing Program: Cost-benefit analysis - March 2024