

Evaluation of Public Policies and Social Programs

Session 2: Traditional CBA I — Private Appraisal, Counting Costs, and Shadow Prices

Andrés Barrios Fernández

Wednesday, August 5, 2026

MA in Economics, Universidad de los Andes, Chile — Second Semester 2026

Today

1. The private appraisal baseline
2. What counts as a social cost? Shadow pricing
3. Case study: a job training program
4. Deep discussion and what we learned

No paper presentation today.

Learning Objectives

By the end of today's session, you will be able to:

- Apply the private appraisal toolkit (NPV, IRR, private discount rate) as a baseline, and state precisely what it omits
- Distinguish transfers from real resource costs, and explain why the distinction matters for social accounting
- State the production-efficiency logic behind shadow pricing, and know when market prices are (and are not) trustworthy welfare measures
- Calculate net government cost including fiscal feedbacks

The Private Appraisal Baseline

Recall: Harberger's third postulate

Session 1: costs and benefits are measured in present-value terms, in a common numeraire, appropriately discounted.

Today we get precise about *which* costs, *which* benefits, and *which* prices — starting from the simplest possible version: one funder, one discount rate.

NPV and IRR, from a single funder's perspective

- Fundación Astoreca's own budget, or a donor's narrow ROI
- $$\text{NPV} = \sum_t \frac{\text{Net Cash Flow}_t}{(1 + r)^t}$$
- IRR: the rate r that sets $\text{NPV} = 0$

The private discount rate

Private discount rate = opportunity cost of *the funder's* capital

This is *not* the social discount rate. We preview it here; we develop the social discount rate fully in Session 12.

Why private appraisal alone is not enough

A private appraisal tells you whether the project pays off for *one* decision-maker, at *their* discount rate.

It is silent on:

- Everyone else the project affects
- Non-market value created or destroyed
- Whether the funder's discount rate is the right one for a public or philanthropic decision

That's why it's a *baseline*, not the answer — it is Harberger's postulate 2 (sum across *all* affected parties) applied to only one party.

What Counts as a Social Cost?

Transfer vs. real resource cost

Transfer

Money changes hands (taxes, subsidies, stipends).

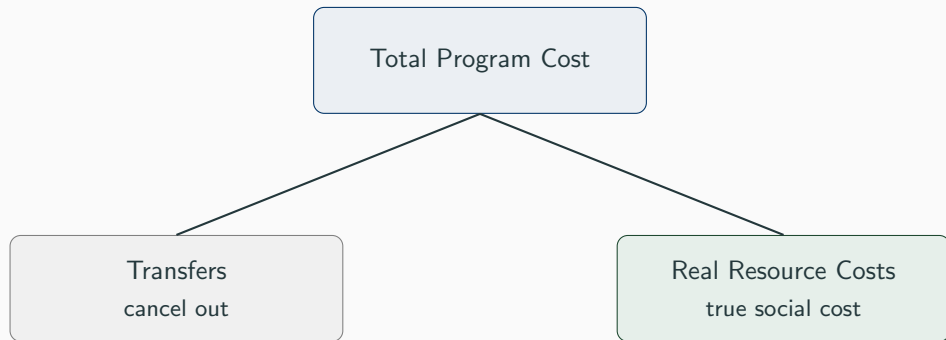
Cancels out in social accounting — one party's loss is another's gain.

Real resource cost

Actual resources consumed (labor, materials, land, time).

Does not cancel — this is a genuine social cost.

The cost taxonomy, visually



The hard question: what price do we use?

A market price is only a valid welfare measure *if* it reflects true social marginal value.

What do we do when:

- there is no market at all (volunteer time, donated land)?
- the market price is distorted by taxes, subsidies, or rationing?

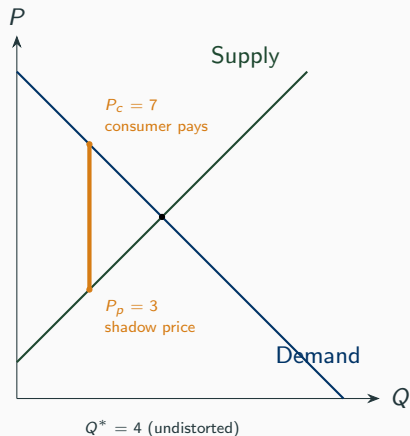
Grounding shadow pricing: Diamond & Mirrlees (1971)

Diamond, P. & Mirrlees, J. (1971), “Optimal Taxation and Public Production I,” AER

With an optimal — potentially nonlinear — tax system already doing the work of redistribution, *aggregate production should remain efficient*. Public project appraisal should therefore value inputs and outputs at their true resource cost (producer prices net of distorting taxes), not at distorted consumer prices.

This is the theoretical foundation for the “shadow price” tradition in Boardman et al. and in Squire & van der Tak’s World Bank framework.

Shadow pricing, illustrated



The orange wedge is the tax. Diamond & Mirrlees: value the project's use of this input at P_p , the producer/shadow price — not P_c .

The practical takeaway

- If a market price is close to the competitive, undistorted price: use it (Harberger's postulate 1)
- If it is distorted (a subsidized input, a rationed good, an informal-market wage) or simply doesn't exist: build a shadow price from the underlying opportunity cost
- Redistribution is, in principle, better handled through the tax system than by mispricing project inputs — an argument we will revisit and complicate in Session 8

Behavioral responses that feed back into the government (or funder's) budget.

Example: a program that raises earnings also raises tax revenue and lowers transfer payments — both change the true net cost.

We will formalize this completely in Session 5 (Hendren & Sprung-Keyser, 2020) — today, just learn to spot it and compute it.

$$\text{Net Government Cost} = \text{Mechanical Cost} - \text{Induced Tax Revenue} + \text{Induced Transfer Costs}$$

Case Study: A Job Training Program

12-week training program

- Direct cost: \$3000/participant
- Stipend: \$200/week (\$2400 total)
- Forgone earnings while training: \$300/week (\$3600 total)

Estimated effects

- **Assume a 0% discount rate** (Session 12 covers $r > 0$)
- Annual earnings *if employed*: \$3500/yr (without program) → \$5000/yr (with program) — even participants who'd have worked anyway get a raise
- Employment rate: 60% → 75%; effects last 10 years
- Tax rate: 20%; participants previously received \$50/week in unemployment benefits (\$2,600/yr — below both earnings figures, so working still pays)

Task (small groups, 15–20 minutes)

Calculate:

1. Real resource costs
2. Transfer costs
3. The average earnings effect — split into its *intensive-margin* (existing workers' raise) and *extensive-margin* (newly employed) components
4. The total direct benefit to participants from increased earnings, and how it splits between participants (after-tax) and government (via taxes)
5. Fiscal externality from reduced UI payments (during training)
6. Net cost to government
7. Net cost to society
8. Net benefit to society — and whether this is really the whole story

Solution: costs and transfers

Real resource cost = $3000 + 3600 = 6600$

Stipend (\$2400) is a *transfer*, not a social cost

Solution: decomposing the earnings effect

$$E[\text{earnings} \mid \text{no program}] = 0.60 \times 3500 = \$2,100/\text{yr}$$

$$E[\text{earnings} \mid \text{program}] = 0.75 \times 5000 = \$3,750/\text{yr}$$

$$\Delta = \$1,650/\text{yr}$$

		Contribution
Intensive margin (60% who'd work anyway)	$0.60 \times (5000 - 3500)$	\$900
Extensive margin (15pp newly employed)	$0.15 \times (5000 - 0)$	\$750
Total		\$1,650

Over half the average gain (\$900 of \$1,650) goes to participants who would have been employed *anyway*.

Solution: the total direct benefit

With $r = 0$, present value is just the plain 10-year sum — no annuity factor needed (Session 12 covers $r > 0$):

$$\text{Total direct benefit} = 1650 \times 10 = \$16,500$$

This benefit splits between participants and government:

$$\text{To government (taxes)} = 0.20 \times 16,500 = \$3,300$$

$$\text{To participants (after-tax)} = 0.80 \times 16,500 = \$13,200$$

The \$3,300 government share *is* the “fiscal externality from earnings” — same number, different lens.

Solution: fiscal externalities and net cost

Fiscal ext. (earnings) = \$3,300 (government's share, previous slide)

Fiscal ext. (reduced UI) = $50 \times 12 \times 0.15 = 90$

Net government cost = $3000 + 2400 - 3300 - 90 = 2010$

Still a real cost to government — \$2,010, not the full \$5,400 sticker price.

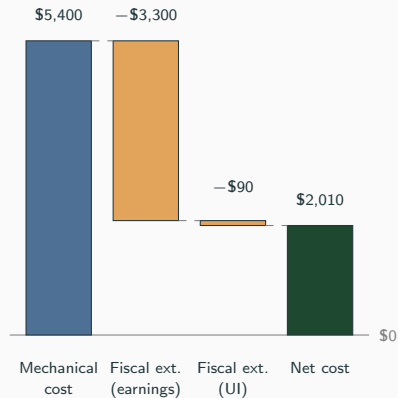
Net social cost = 6600 (the real resources).

Does the UI reduction belong in the social calculation?

The \$90 UI saving lowers the *government's* net cost. Does it also lower *society's* net cost?

- **No.** UI is a transfer: the government's \$90 saving is exactly matched by a \$90 *loss* to the person who no longer receives it
- At the social level the two cancel — just like the stipend earlier in this exercise — because nobody's real resources changed, only who holds the money
- This is why **net social cost** (\$6,600) never included the stipend *or* the UI change, while **net government cost** (\$2,010) — a fiscal-accounting concept, not a welfare concept — correctly includes both

From mechanical cost to net cost: a waterfall



A mechanical cost of \$5,400 falls to a net cost of \$2,010 once fiscal externalities are netted out — still a real cost to government, just a smaller one.

Solution: net benefit to society

$$\begin{aligned}\text{Net benefit} &= \text{Total direct benefit} - \text{Net social cost} \\ &= 16,500 - 6,600 = \$9,900\end{aligned}$$

$$\text{Benefit-cost ratio} = 16,500/6,600 \approx 2.5$$

A positive recommendation — on the benefits we currently know how to count.

Deep discussion: was \$3000 the right price?

Should you trust the \$3000/participant “direct cost” figure as a true resource cost?

- Does it use subsidized public facilities, or below-market instructor wages?
- If the training facility has an alternative use, is its rental rate the right opportunity cost, or should you build a shadow price?
- How does this connect to Diamond & Mirrlees: is this market close enough to undistorted to trust the price?

Deep discussion: is \$16,500 the whole benefit?

\$16,500 counts only the direct earnings gain. What else might the program generate that this number misses?

- **Household externalities:** effects on spouses, children, or other household members from a parent's higher and more stable income
- **Health:** employment and income are strongly associated with better physical and mental health — what would you need to claim this is causal, here?
- **Education:** could a more stable household income improve children's school outcomes?
- **Other:** reduced reliance on other safety-net programs, lower crime, ...

None of this is priced yet — valuing it is exactly what Sessions 6–7 (non-market valuation) and Session 14 (externalities) will equip you to do. Treat \$9,900 as a *lower bound*.

Wrap-Up

How would you apply this cost taxonomy to the Astoreca school?

- Construction (real resource cost, or transfer of donated land?)
- Teacher salaries — market wage, or a shadow price if the labor market for qualified teachers is distorted?
- Forgone use of the site
- Families' time costs

We will meet Fundación Astoreca directly in Session 4 — start a running list of questions this raises for you.

What We Learned Today

- A private appraisal is a legitimate first step, but it only satisfies Harberger's postulate 2 for *one* party — it is a baseline, not the answer
- Transfers cancel in social accounting; real resource costs do not
- Diamond & Mirrlees give the theoretical reason to distrust distorted market prices and to shadow-price inputs at their true opportunity cost
- Net government cost must net out fiscal externalities — a preview of the full MVPF machinery coming in Session 5
- An average benefit can blend an intensive margin (existing workers earn more) and an extensive margin (new workers enter employment) — conflating the two, or leaving it unstated, silently changes your answer
- Even a careful direct-benefit number (\$16,500, earnings only) is usually a *lower bound* on true social benefit — household, health, and education spillovers are real but need separate valuation tools

- Continue Problem Set 1 (self-study checkpoint: by Session 7)