Social Insurance: Moral Hazard and Adverse Selection

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Application: Why take a class NRO?

- Vassar allows students to take a class *NRO* (Non-Recorded Option), meaning the grade does not affect their GPA.[1]
- In effect, NRO grading provides insurance against a bad semester.
- It can reduce students' academic risk—especially when taking challenging or unfamiliar subjects.
- Normatively, we might view this as a way to promote exploration and reduce stress.
- Positively, however, it can change behavior and incentives in unexpected ways.

[1] To be clear: I have no idea if anyone here has done this, and please don't tell me!

How might NRO affect grades across campus?

- Imagine the college introduces NRO for the first time.
- A dean notices that *average letter grades* have gone up.
- They conclude: "Students must be learning more—and NRO must be helping!"
- But before we celebrate, we should ask:
- Is there another possible explanation?

Adverse Selection and NRO

- Suppose two equally strong students face different workloads:
  - You are writing two theses and taking an upper-level elective outside your major.
  - Your friend is taking that same elective plus several intro-level MOI courses.
- Who is more likely to take the elective NRO?
- Even if ability is the same, students under more stress or risk may opt for NRO.
- This creates *adverse selection*: lower expected grades are hidden from official GPAs.
- So when we observe higher average grades, they may reflect *who opts out*—not necessarily *what students learned*.

Learning Goals

- Understand the role of insurance
- Define moral hazard and adverse selection problems
- Isolate reasons government is involved in different social insurance markets
- Identify potential moral hazard and adverse selection in social insurance programs/markets
- Characterize trade-offs in optimal insurance provision

Insurance

- Resources may be variable in the presence of uncertainty...
- ...however individuals want to "smooth" their consumption and may not be able to do so by themselves
- Insurance lets people pay a premium to receive a payout in the event of a loss and smooth consumption
- Many people pay in and only a few receive payouts, so on net an insurer makes at least zero profit
- "Actuarially fair insurance" charges a premium equal to the expected payout, so the insurer makes zero profit
- "Actuarially fair" premium rarely charged. Today is about why.

Problems with providing insurance

Asymmetric information: One party knows more about the situation than the other. In insurance markets, buyers know more about themselves than insurers do, which creates problems:

- **Adverse selection**: People most likely to need insurance are most likely to buy it.
- **Moral hazard**: Insurance can make people take more risks.

These problems mean insurance might not work well—or may not exist at all.

Example: Adverse Selection

- Suppose a private firm offers unemployment insurance paying \$1,000 upon job loss.
- There are two equally sized groups:
  - **Overachievers:** job loss probability $p^O = 0.1$
  - **Shirkers:** job loss probability $p^S = 0.5$
- The firm cannot tell who is who, so it assumes each person has a 50% chance of being either type.

Can full insurance be provided?

- **Case 1: Full information** $\Rightarrow$ actuarially fair prices:
  - Overachievers: $p^O \cdot \$1000 = 0.1 \cdot \$1000 = \$100$
  - Shirkers: $p^S \cdot \$1000 = 0.5 \cdot \$1000 = \$500$

- **Case 2: Asymmetric information** $\Rightarrow$ everyone charged the same premium.
  - Expected payout: $(0.5 \cdot 0.1 + 0.5 \cdot 0.5) \cdot \$1000 = \$300$
  - Premium $= \$300 \Rightarrow$ too expensive for O, cheap for S
  - If overachievers drop out, the firm learns all buyers are shirkers:
  - New expected payout: $0.5 \cdot \$1000 = \$500 \Rightarrow$ premium rises to \$500

- Market unravels: insurance becomes inefficient or disappears entirely.

Example: Moral Hazard

- Now suppose there is only one type of worker.
- Probability of job loss depends on effort e: $p(e) = 0.1$ with $p'(e) < 0$
- Job loss costs \$1,000, so the actuarially fair premium is \$100.
- With insurance, workers exert less effort $\Rightarrow p(e') = 0.2$
- Insurer now pays \$200 on average but collects only \$100.
- Result: fair-price insurance is no longer sustainable.

Everyday Examples of Moral Hazard

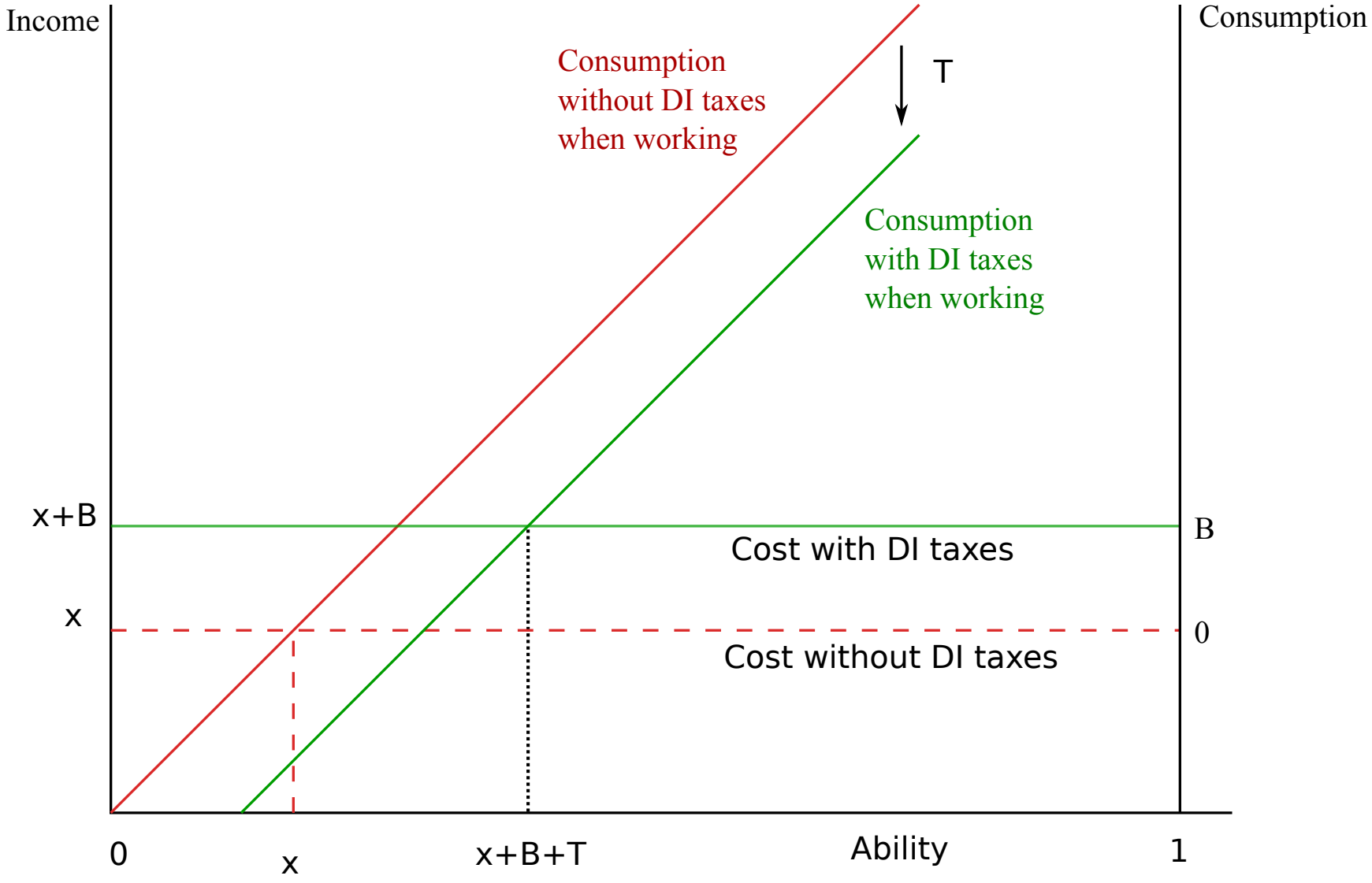
- Not searching for work while receiving unemployment benefits
- Building in flood- or earthquake-prone areas
- Exaggerating injury or disability
- Taking fewer workplace safety precautions
- Overusing medical care
- Seasonal layoffs

Simple model of social insurance with moral hazard

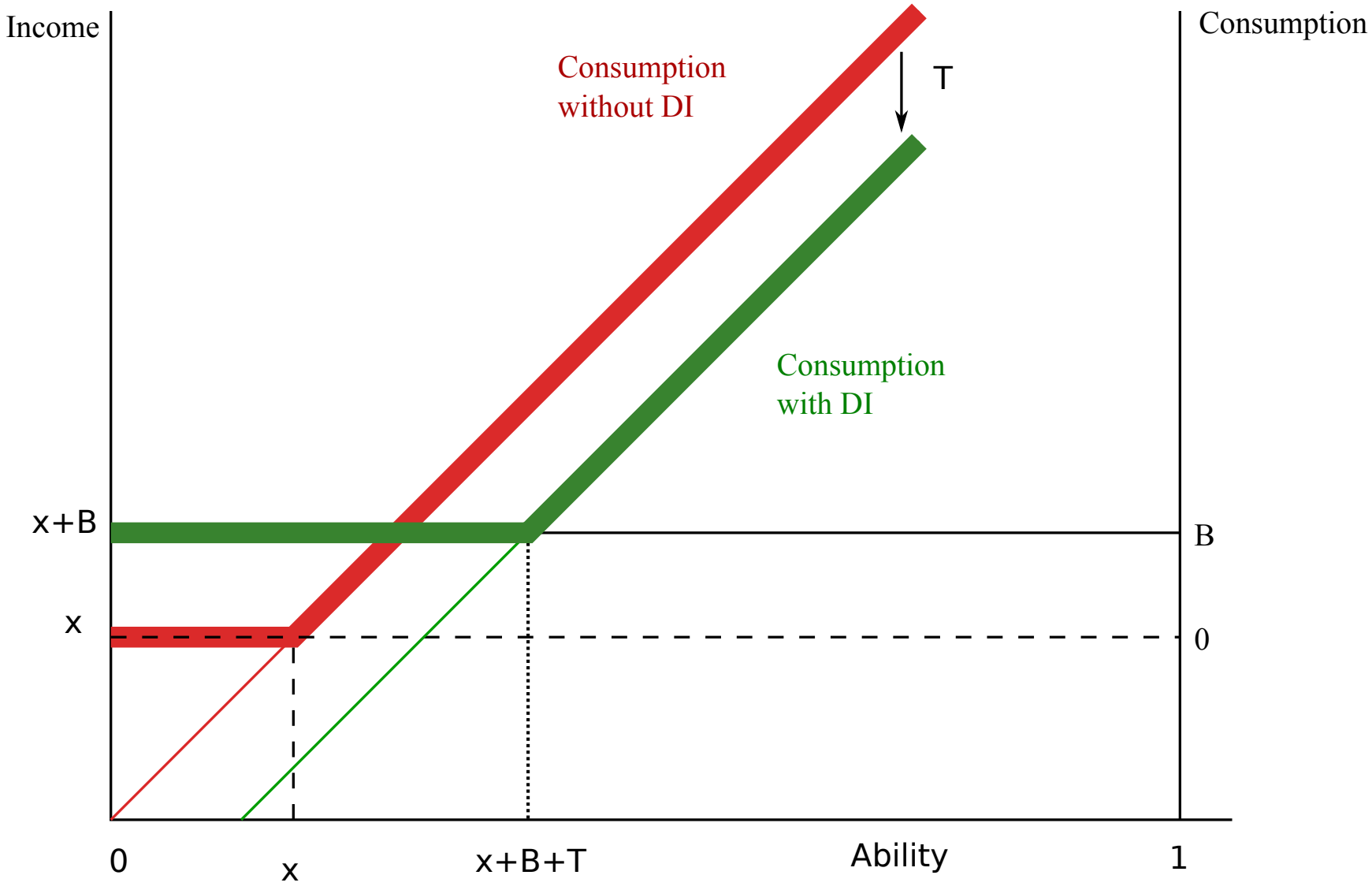
- Imagine individuals have ability a and must pay cost x to work.
- Workers earn a; non-workers earn 0 (before taxes and benefits).
- Workers pay tax T, non-workers receive benefit B.
- Consumption:

$$C_{work} = a - T - x \quad \text{vs.} \quad C_{no\ work} = B$$

- Those with $a > B + T + x$ work; others do not.
- Without DI, those with $a > x$ work.
- Ability is private $\Rightarrow$ no adverse selection here, just moral hazard.



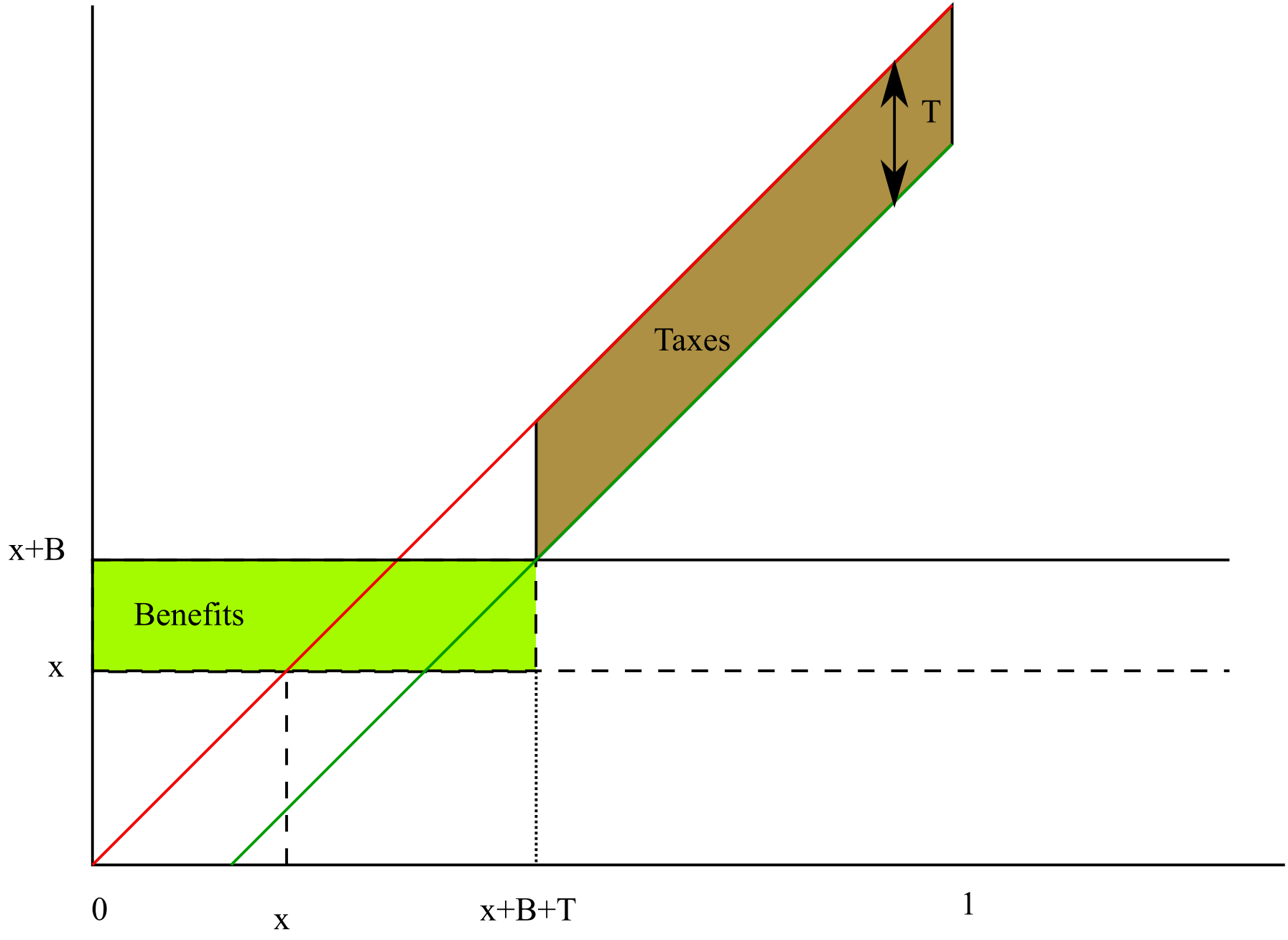
Slight abuse of y-axes. Income $\neq x$ or $x + B$ when not working. It is B or 0. If it helps, consider x a non-pecuniary cost of working.

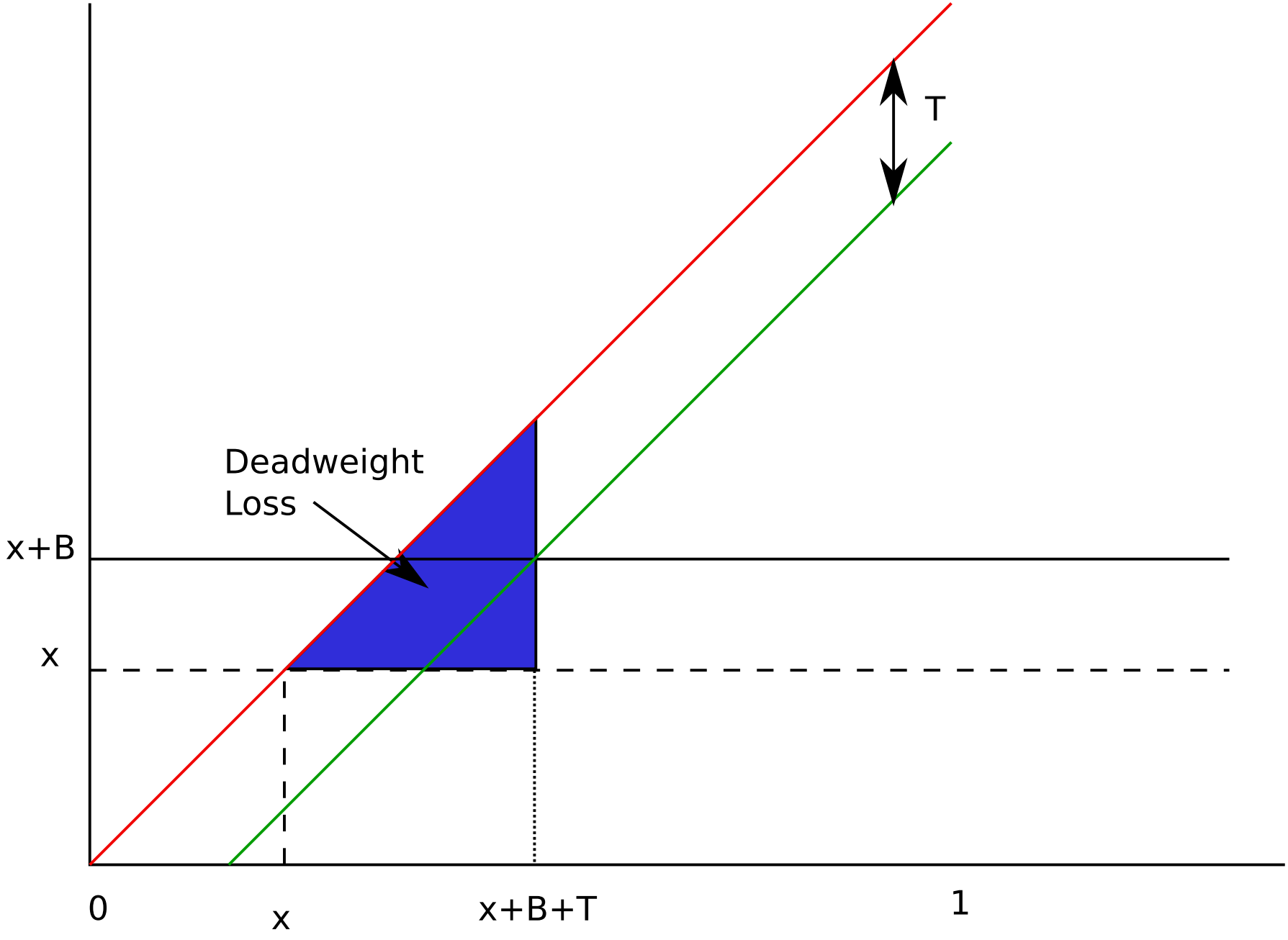


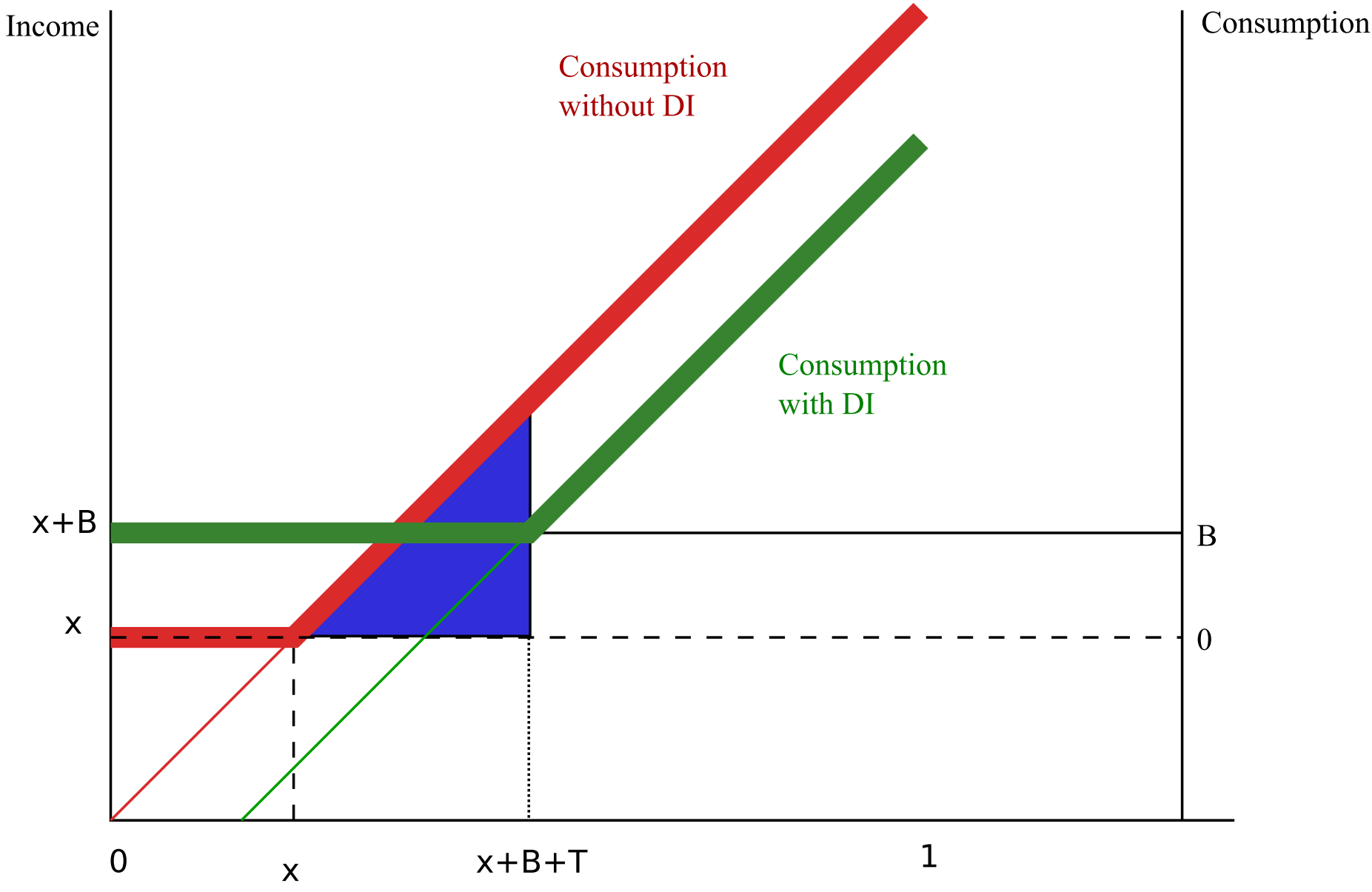
Slight abuse of y-axes. Income $\neq x$ or $x + B$ when not working. It is B or 0. If it helps, consider x a non-pecuniary cost of working.

Implications of the Model

- DI induces those with $x \leq a < B + T + x$ not to work.
- Individuals who could work instead collect benefits $\rightarrow$ **moral hazard cost**.
- Raising B and T smooths consumption but reduces employment.
- Without DI: high inequality (some consume $a - x$, others 0)
- With DI: more equality, lower mean consumption.
- Insurance trades **equality** for **efficiency**.


T
Taxes
x+B
Benefits
x
0
x
x+B+T
1


T
Deadweight
Loss
x+B
x
0
x
x+B+T
1


Income
Consumption
Consumption without DI
Consumption with DI
x+B
x
B
0
0
x
x+B+T
1

Moral Hazard and Policy Design

- Under moral hazard, insurance markets may fail even if everyone is identical.
- The government has no inherent advantage in solving moral hazard.
- Yet policy can sometimes help—through incentives and enforcement:
  - Speeding tickets, anti-fraud checks, work-search requirements
- The key tradeoff in social insurance:
  - More coverage $\Rightarrow$ better consumption smoothing
  - But also weaker incentives and higher costs from moral hazard

Government's role

Between moral hazard and adverse selection, gov't can more easily help with adverse selection. Why?

- Government's advantage: making everyone participate (by public provision or mandating)
- Insurance can be provided even though without intervention it would not be offered
- However, individuals who would opt out in the private market are hurt if they are charged average cost
- Other considerations:
  - externalities (no-fault insurance, vaccinations),
  - administrative costs,
  - redistribution,
  - paternalism

What insurance does the government displace?

Government provision of insurance may "crowd-out" other insurance:

- Private insurance
- Firm-provided severance pay
- Other means of consumption smoothing:
  - Saving for a "rainy day"
  - Informal Risk sharing e.g., within families, crop-sharing in a village, in-kind or cash gifts (Coombs 2025,)

Ultimately, the public-private crowd-out elasticity of a given program is an empirical question (for another day)

Conclusion

- Uncertainty makes it harder to smooth consumption, which is preferred among those with diminishing marginal utility
- Market failure due to asymmetric information can lead to actuarially unfair pricing of private insurance:
  - Adverse selection occurs **before** insurance provided: people know more about their risk than providers and selectively insure
  - Moral hazard occurs **after** insurance provided: people change behavior after insured
- The government can help solve these problems, but it does not always have a clear advantage
- Social insurance one solution, but it is not without costs and works better on adverse selection than moral hazard