What is economics?

- ***Def:*** Economics is the study of the decisions people or society make when resources are scarce (limited).

- ***Def:*** Microeconomics is the study of choices of **individual economic agents** and the way these choices respond to incentives, interact, and are influenced by government policies.

- ***Def***: Macroeconomics is the study of the economy as a whole.

- *Examples of economic questions:*

1) *Should I pursue a post-graduate degree?*
2) *How will my employees behave differently under different pay schemes (such as performance-related pay scheme vs. fixed salary)?*
3) *Why do prices of the same product vary?*
4) *How much will investment spending increase in response to a 1% decrease in interest rates?*
5) *Will temporary tax cuts increase consumption?*

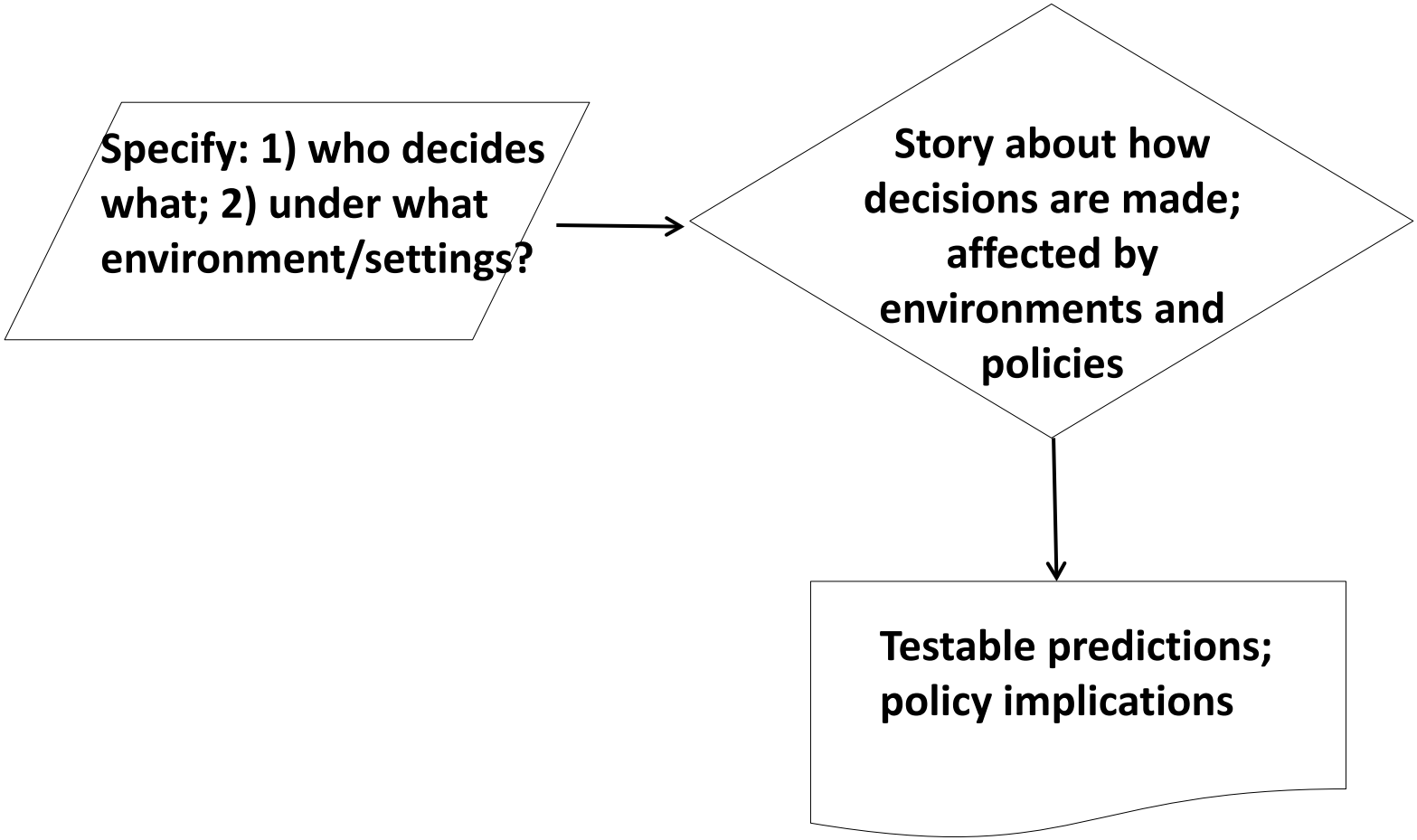
Think like an economist: Economic Principles

- Economists generally believe people are rational and respond to incentives.

- Economists use economic models.
  - An economic model is a **simplified description** of the **mechanism** behind the observed phenomenon.
  - Why “simplified”?

    Because of complexity of the economic world

Economic Model



Think like an economist: Economic Principles

- Economists use mathematical reasoning and statistical inferences.
  - Why do economists try to describe human behavior with mathematical equations?
  - e.g. $\frac{MU_x(X^*,Y^*)}{MU_y(X^*,Y^*)} = \frac{P_x}{P_y}$
  - Mathematics is the most logical and rigorous language we have.
  - Economic data are often quantitative; economic questions are often quantitative.

Think like an economist: Economic Principles

- Economists differentiate correlation from causation.

  Ex) Suppose a hospital hires a surgeon known to be the best in the world hoping it would enhance the reputation. One year later, however, data reveals that more cancer patients have died, say 40%, than before, say 20%, after the world-best surgeon began to practice at the hospital. What can you conclude from this observation?

  - Whereas "Ceteris Paribus"(keeping other things constant) can be an assumption in a model, when working with real world data, one needs to check if the assumption is actually satisfied.
  - When there are **many factors moving simultaneously**, **in order to study one factor's effect on the outcome, one needs to sort out the factor from others**.

Think like an economist: Economic Principles

- Economists consider the relevant cost, that is, economic cost. economic cost=money cost + opportunity cost.

Ex) A marketing director is considering doing product placement in a popular television series. It would cost the company $2 million dollars, but it would likely raise sales by $2.5 million dollars. Any advice for her?

Lecture 1

Learning Objective: By the end of this lecture, students should understand
i. the meaning of opportunity cost.
ii. the meaning of absolute advantage and comparative advantage.
iii. how comparative advantage explains the gains from trade.

OUTLINE:

1. Opportunity cost
2. Comparative Advantage and Gains from Trade

Keywords: Opportunity Cost, Production Possibilities Frontier (PPF), Comparative/Absolute Advantage, Terms of Trade, Consumption Possibilities Frontier

Opportunity Cost

Economists often assume economic agents are rational. In other words, economic agents make optimal choices.

- ***Def***: Optimal choice is the choice of the best alternative among the alternatives permitted by the available resources.
  - *To make an optimal choice, one needs to understand the true cost (economic cost) of something is what you give up to get it.*
  - economic cost=money cost + opportunity cost

- ***Def***: Opportunity cost of an alternative is the (net) value or benefit of the next best alternative that needs to be given up.

Opportunity Cost

- *EX) Jen has to decide whether to go to college or work for Costco. The cost of tuition, books and room and board is respectively $9,000, $1,000 and $10,000 a year. If Jen works for Costco instead, she can make $30,000 a year. She will still have to pay for room and board ($10,000) out of pocket. Calculate the* ***(economic) cost*** *of attending college for one year.*

  Ans: $40,000

  The monetary(accounting) cost of attending college is $20,000 a year.

  If she works for Costco instead, she would make $30,000. After paying for room and board, she will have $20,000 on hand. This forgone income is the opportunity cost of attending college.

  NOTE: if your answer had been $50,000 (which is wrong), you might have accounted for the cost for room and board ($10,000) twice! Since this cost enters both choices, you should not double-count it by counting as monetary cost and also as opportunity cost.

Opportunity Cost

- *Ex) If Jen earns a college degree, she can earn $40,000 per year. Assume she currently has 35 years before she retires and it takes 5 years for Jen to graduate.*
- *Q) Fill the following table. Is pursuing a college degree an optimal choice for Jen?*

	Attending College	Working for Costco
(a) Benefit(value)	$1,200K (=$40K×30yrs)	$1,050K (=$30K×35yrs)
(b) Money Costs	$50K+A (=$10K×5yrs+A)	$10K×35yrs (A)
(c) Net Monetary Value	$1,150K-A	$1,050K-A
(d) Opportunity Cost	$1,050K-A	$1,150K-A
(e) Economic Cost	$1,100K	$1,150K
(f) Net Economic Value (a-e)	$100K	-$100K

* A=$10K×35yrs (costs for room and board over 35 years. A is constant whether to go to college or to work for Costco)

Opportunity Cost

I. *By earning a college degree, Jen can make $100,000* ***more*** *than the next best alternative.*

II. *While the accounting/monetary benefit of a choice only indicates the choice's own benefit (ignoring other available alternatives), the economic benefit indicates the extent to which that choice is better or worse than the next best alternative.*

III. *This is because the economic cost is a cost concept that highlights the "trade-offs" the decision-maker faces.*

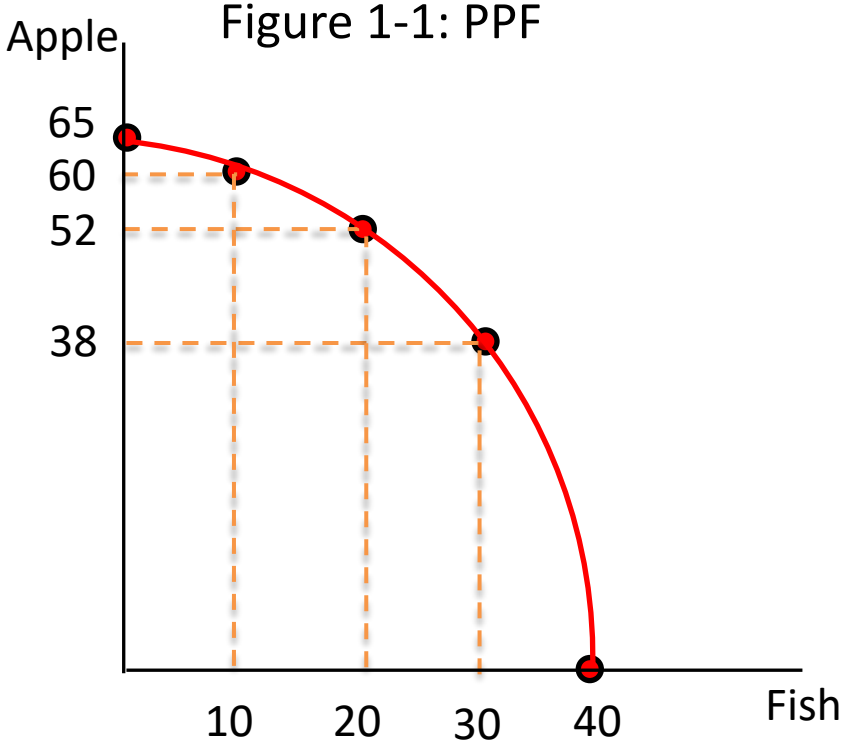
Production Possibilities Frontier (PPF)

- ***Example:*** Consider an island economy with 50 workers, 4 boats with fish net and 20 apple trees. Each worker can work at most 8 hours a day.

- Table 1-1: Production Possibilities

Time allocated to fishing –picking apple	Fish	Apple
400 hrs – 0 hrs	40	0
300 hrs – 100 hrs	30	38
200 hrs – 200 hrs	20	52
100 hrs – 300 hrs	10	60
0 hrs – 400 hrs	0	65

Figure 1-1: PPF



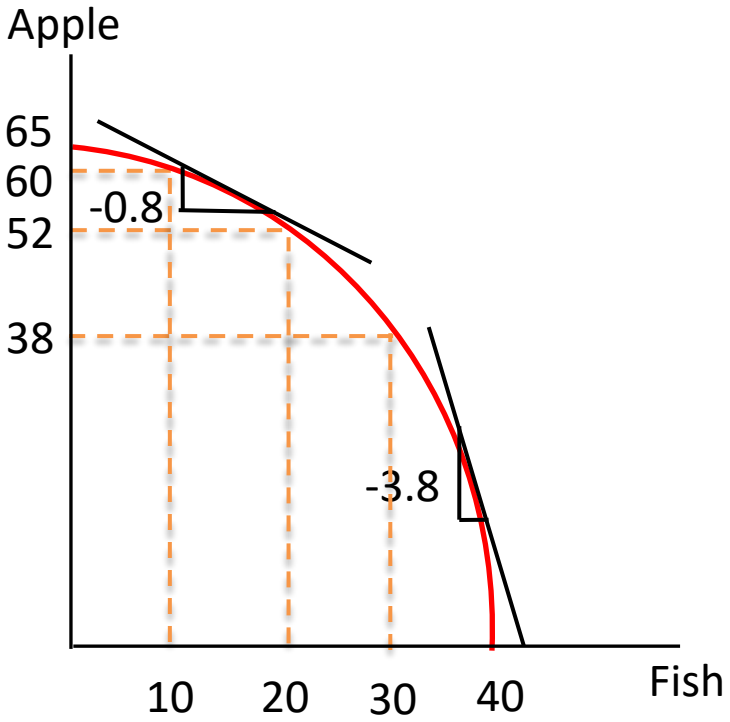
- ***Def***: Production Possibilities Frontier is the boundary between the combinations of goods (and services) that can and cannot be produced, given the available factors of production and the state of technology.

Slope of Production Possibilities Frontier

- Q: What determines the shape of a production possibilities frontier?

  Resources and technology

- Two characteristics of the PPF in Figure 1-1:



1. The curve has a negative slope.

   Limited resources creates a **trade-off**: Once all the resources are used by the economy, the only way of getting more of one good (e.g. fish) is to allocate less resource to production of the other good (e.g. picking apples).

   The slope of a PPF measures the opportunity cost of production of the good in the X-axis at each quantity of the good.

Slope of Production Possibilities Frontier

2. The PPF is concave to the origin. (The PPF is bowed outward) .

It implies that _opportunity costs increase._

Given some input (e.g. boat and fish net) is limited, (relative) productivity of an additional unit of the other input (labor) is bound to decrease (for example, because workers would have to share the limited input)

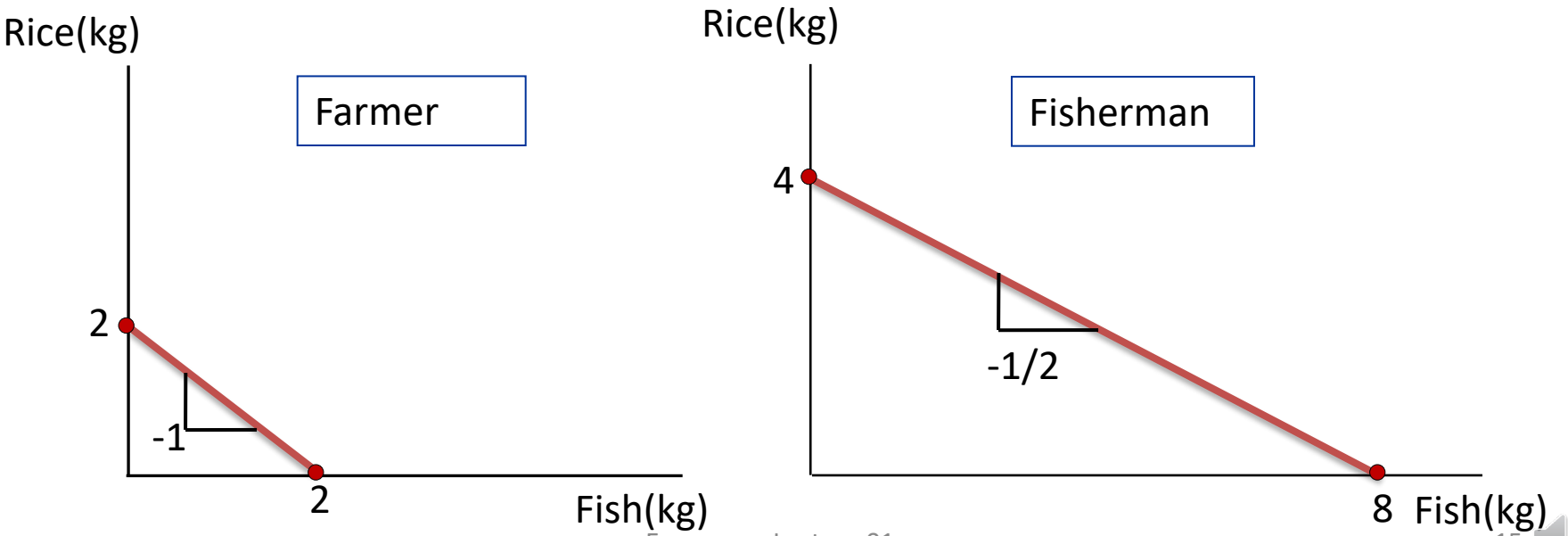
Linear (straight line) PPF

- *Ex: Mr. Farmer and Mr. Fisherman*, endowed with 8 hours, must allocate their time between *growing rice and catching fish to feed their families.*

Table 1-2: Hours taken for each activity

	Growing Rice	Catching fish
Farmer	4 hours/1 kg	4 hours/1kg
Fisherman	2 hours/1 kg	1 hour/1kg

- Figure 1-2: Farmer's and Fisherman's PPFs



Absolute Advantage

Def: An individual has an absolute advantage over someone else in the production of a good, if that individual can produce the good using fewer inputs than the other person.

- *Q:Who has an absolute advantage in which good?*

  Mr. Fisherman has an absolute advantage over Mr. Farmer in producing both goods.

Comparative Advantage

***Def*:** An individual has a comparative advantage over someone else in the production of a good, if that individual produces the good with a lower opportunity cost than the other person.

Q:Who has a comparative advantage in which good?

First, we need to calculate opportunity cost(OC) of each activity for each person

	OC of 1 kg rice	OC of 1 kg fish
- Farmer:	1 kg fish	1 kg rice
- Fisherman:	2 kg fish	½ kg rice

Farmer has a comparative advantage in growing rice and Fisherman has comparative advantage in catching fish.

Consumption Possibilities Frontier

- **Def**: Consumption Possibilities Frontier is the boundary between the combinations of goods (and services) that can and cannot be consumed.

- Figure 1-3: Farmer and Fisherman's consumption possibilities frontier without trade

  Without trade, one's consumption possibilities frontier is identical to its production possibilities frontier

- *Q1: Suppose currently the Farmers produce 1 kg rice and 1 kg fish, and the Fishermans produce 1 kg rice and 6 kg fish. Can they increase the production level by working out a plan in which each specializes in one activity? Who should specialize in what activity?*

  Yes. Farmer should specialize in growing rice and Fisherman should specialize in catching fish. This will result in 2 kg rice and 8 kg fish in total.

- In general, there can be mutually beneficial trade if each party specializes in the production of the good in which it has a comparative advantage over the other.

Terms of Trade

- *Q2: Suppose both Farmer and Fisherman specialize as in Q1. What is the range of prices at which mutually beneficial trade can occur?*

Farmer buys fish and sells rice. The price of fish must be cheaper than or equal to the cost of catching it by himself. Thus, the price of 1 kg fish must be less than 1 kg rice. Equivalently, the price of 1 kg rice should be more than 1 kg fish (i.e. 1 kg rice should be exchanged for more than 1 kg fish).

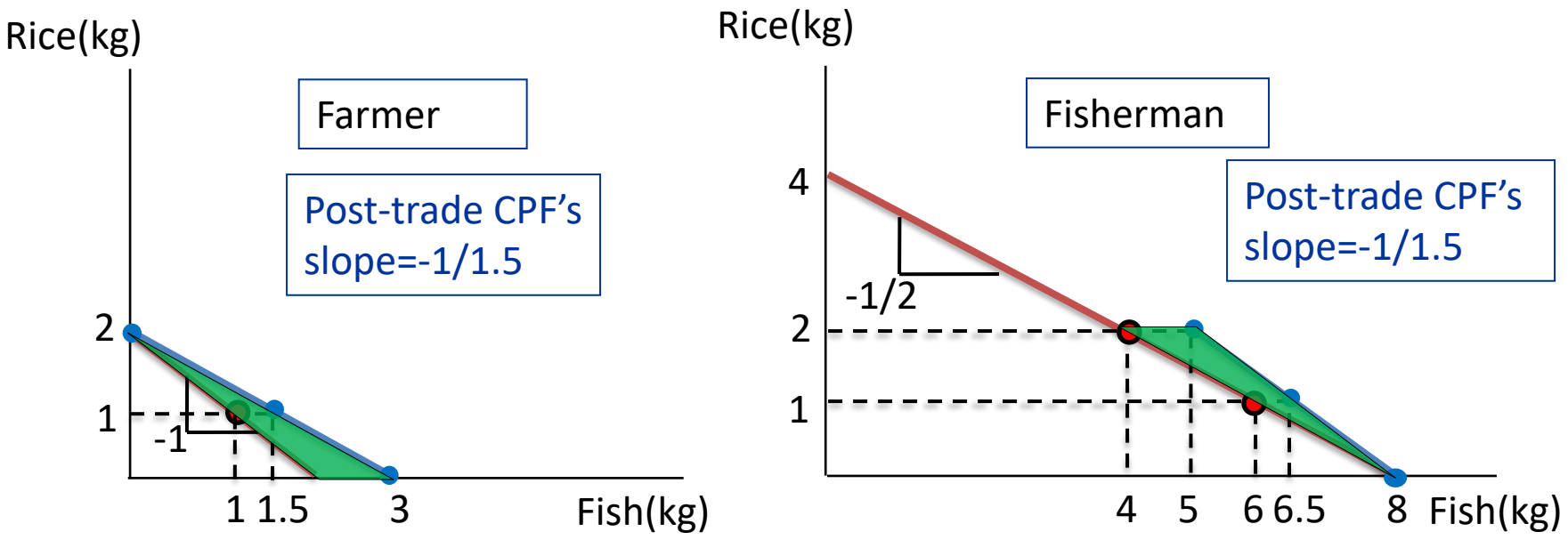
Fisherman buys rice and sells fish. The price of rice must be cheaper than the cost of growing it by himself. That is, the price of 1 kg rice must be less than 2 kg fish. Equivalently, the price of 1 kg fish must be more than ½ kg rice.

Hence, 1kg fish ≤ price of 1 kg rice ≤ 2kg fish
(In terms of the price of fish, ½ kg rice ≤ price of 1kg fish ≤ 1kg rice)

Gains from Trade

- Suppose that the terms of trade is that 1 kg of rice is exchanged for 1.5kg of fish.

Figure 1-4: Farmer and Fisherman's consumption possibilities frontier with trade



Gains from trade is shown by expansion of one's **consumption possibility frontier**: the consumption bundles in the green area were unattainable before trade, but are now attainable.