

Creating Value



Willingness to Pay and
Opportunity Cost

Value creation



- In any market, before considering who gets what it is important to understand what there is to get.
- What determines total value created?

Application



The Demand and Supply of
Time

Assessing Value Created



- Who are the players?
 - What are customers willing to pay for the good or service?
 - What are suppliers' opportunity costs of providing the good or service?
-

Task 1



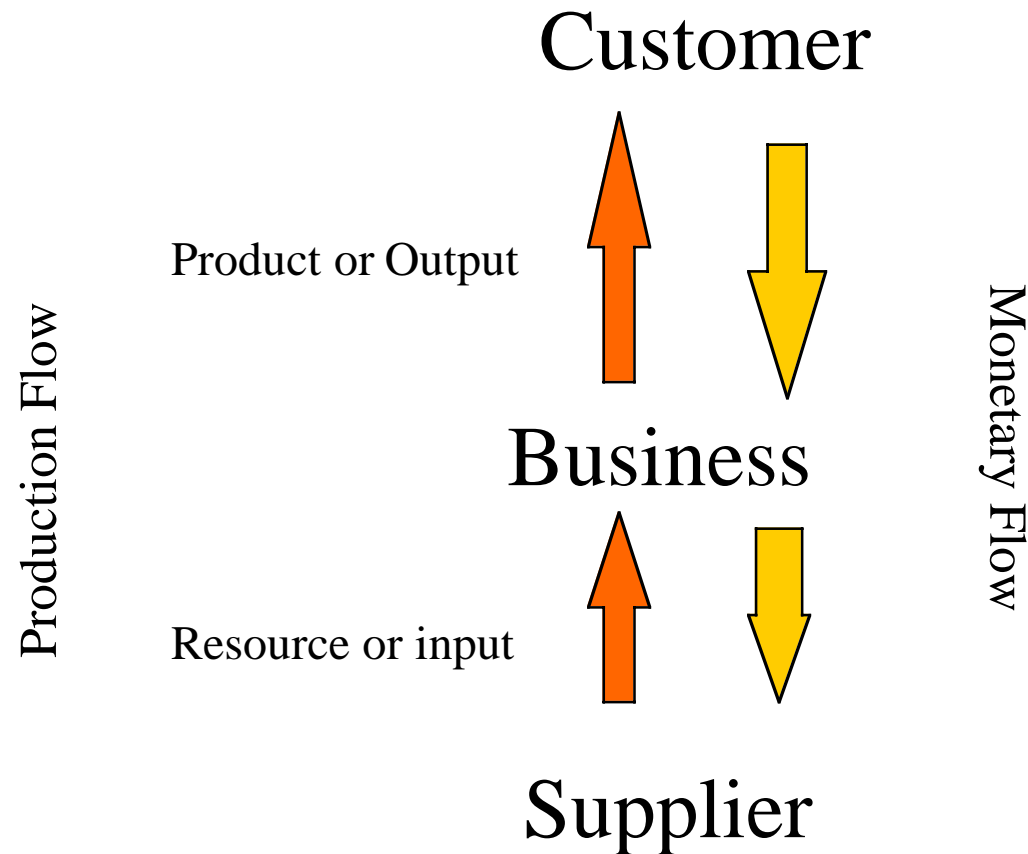
Who are the players?

Players



- Who are the economic players involved in the creation of economic value?
 - *Customers*: derive economic value from use, they are the ultimate recipients of value
 - *Firms or Businesses*: convert inputs or resources into products or output
 - *Suppliers*: provide resources or inputs for use in production
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The Value Chain



- The “production flow” and the “monetary flow” go in opposite directions
 - Business is engaged in two markets: buying resources *and* selling products.
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Follow the Dollar



- Who is a customer?
 - Anyone who pays dollars into the business

 - Who is a supplier?
 - Anyone who receives dollars from the business

 - Sounds obvious? ...
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Shades of Grey ...



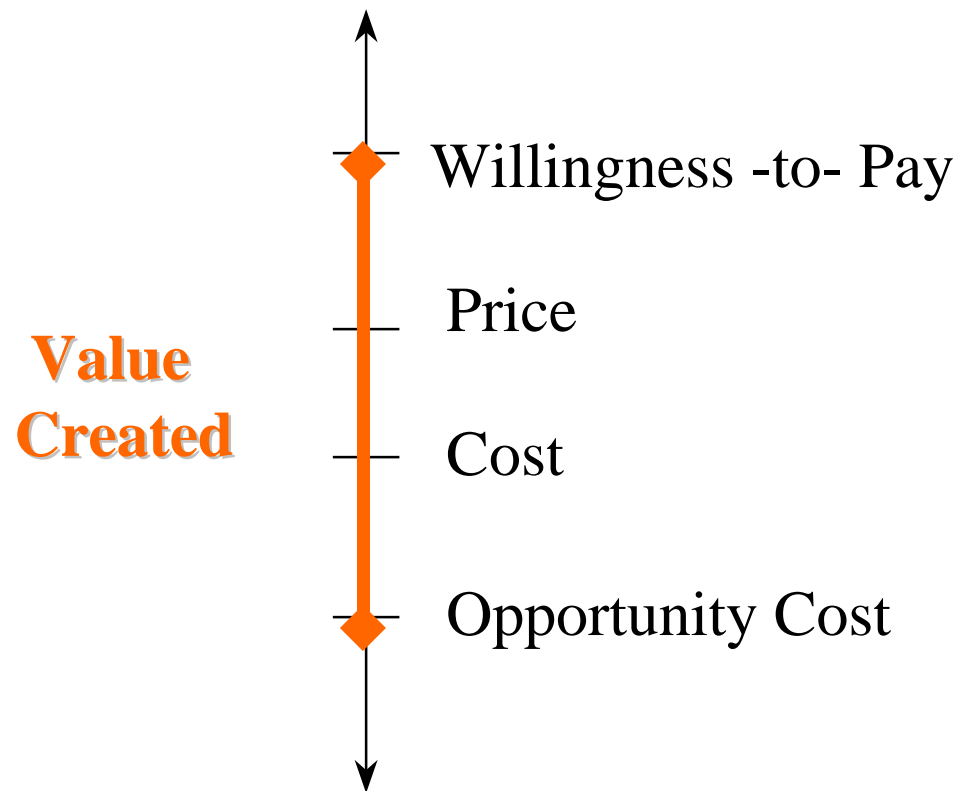
- A charitable organisation (e.g., Red Cross):
 - who are its customers?
 - who are its suppliers?
 - A newspaper:
 - who are its customers?
 - A bank:
 - who are its customers?
 - who are its suppliers?
-

Extending the Value Chain



- The Value Chain really extends all the way from owners of non-produced ('primitive') resources to end-users ('consumers')
 - one business's output is often another's input
 - even 'finished' products are sold to distributors/retailers before customers
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Value Creation



Task 2



Customers' Willingness to
Pay

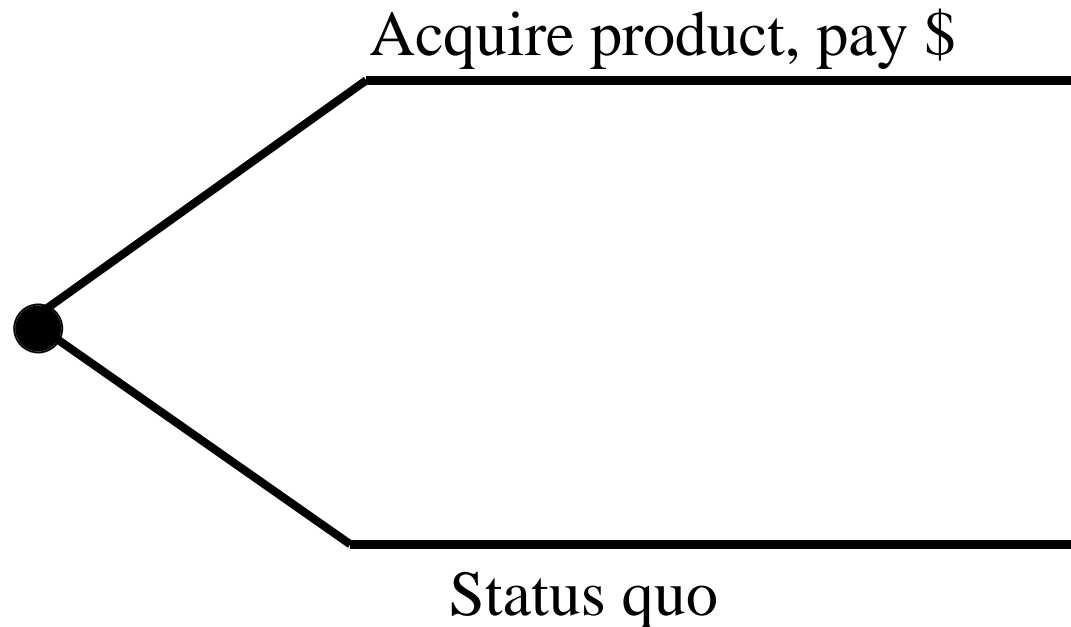
Measuring Value Creation



- Measuring value creation involves stepping into the shoes of customers and suppliers
 - Ask:
 - How much does the customer 'value' the product it acquires?
 - How much does the supplier 'value' the resource it provides?
 - What is the difference between these two quantities?
 - Sounds circular? ...
-

Customer Willingness-to-Pay

- To measure a customer's increase in well-being perform a 'thought experiment':



Consumer surplus



- Find the maximum amount of dollars the customer would pay to acquire the product

Willingness-to-Pay

- Then the increase in the consumer's well-being is:

Willingness-to-Pay

minus

Price paid

Determining Willingness-to-Pay



- Sometimes, willingness-to-pay can be objectively determined


Example: Industrial equipment (Case: Harnischfeger portal cranes)

- Often, willingness-to-pay is subjective

Example: many consumer products

- Whether objective or subjective willingness-to-pay is a definite
-

Willingness-to-Pay: More Examples



- Consumers capture enormous value from many products:
Willingness-to-Pay \gg Price Paid
 - Quality has increased while prices have fallen for:
 - | computers
 - | cars
 - | (generic) drugs
-

Thought questions



- How much would you be willing to pay for a coffee right now? How much would you be willing to pay for a coffee at the café next door?
 - If price follows cost, why are CDs more expensive than LPs?
-

Case Study 1



Harnischfeger Portal
Cranes

Calculating WTP: Log Rolling



- Processing of large tree logs:
 - if can handle tree length sizes, then more productive and higher quality
 - very unwieldy: loading and re-loading
 - Old Technology: mobile log stackers.
 - Large forklifts
 - operate on paved roads -- much wear
 - use 4 at a time
-

Harnischfeger Industries



- Developed the 'portal crane'
 - grabs logs from above with large claw-like grapples, hoists them into the air and carries them the entire length of the woodyard, very rapidly
 - huge structures (300 feet) operating on runways (2000 feet).
 - woodyards only need one of them.
-

Costs: Mobile Stackers



- lasts 4 years
 - costs \$250,000
 - operating costs (annual, \$'000)
 - labour 60
 - energy 20
 - log breakage 50
 - equipment maintenance 30
 - parts 20
 - road maintenance 100
-

Costs: Portal Cranes



- Last 20 years (estimated)
 - Operating costs (annual, \$'000)
 - labour 60
 - energy 20
 - log breakage 40
 - runway maintenance 20
 - Parts and maintenance in purchase price
 - Freight charge (\$50,000); runway
-

WTP for Portal Cranes?



- Amount of money for which the woodyard is indifferent between buying and not buying a portal crane.
 - First question: What will the woodyard pay for log handling capability without a portal crane?
-

WTP for Log Handling Capability I



- Four stackers used typically
 - Annual operating cost is \$180,000 each, so \$720,000 per annum in total.
 - Last four years: assume replace one per year. This adds \$250,000 to the annual cost.
 - \$100,000 in roadway maintenance
 - TOTAL = \$1,070,000 per year.
-

WTP for Log Handling Capability II



- Woodyard prefers paying \$1,070,000 for log handling capability to any other arrangement.
 - But they will not pay this amount for a portal crane.
 - Still have to incur operating costs
-

WTP for Portal Cranes



- Additional costs:
 - Operating costs = \$140,000
 - One-time costs = \$425,000
 - The decision:
 - Don't Buy: pay \$1,070,000 per year
 - Buy: pay \$WTP for crane + \$425,000 now and then \$140,000 per year
 - Trade-off types of costs (see Topic 4)
-

Calculating WTP



- WTP is the value of \$WTP such that the woodyard is indifferent between buying and not buying.

- Solve

$$- \$WTP - \$425,000 - \$140,000/\text{year} = - \$1,070,000/\text{year}$$

$$\text{or } \$WTP = - \$425,000 + \$930,000/\text{year}$$

Present Value I



- Compare initial expenditure with flow savings per year.
 - r is the annual discount (interest) rate
 - Present value terms of WTP
= - \$425,000 + \$930,000/ r
(ignore need to replace crane after 20 years)
 - WTP depends on interest rate.
-

Present Value II



<i>Discount Rate</i>	<i>WTP Portal Crane</i>
5%	\$18,175,000
10%	\$8,875,000
15%	\$5,775,000
20%	\$4,225,000

Lessons from WTP



- What is the decision?
 - Log handling capability versus comparison to other technologies
 - Care over type of costs
 - one time versus on-going
 - WTP can depend on discount rates
-

Competition and WTP



- Without competition, Harnischfeger can probably make about \$5 million per crane.
 - In 1987, faced competition from Kranco bought by former Harnischfeger executives -- very close substitute in terms of costs and efficiency
 - Buyers could play one off against the
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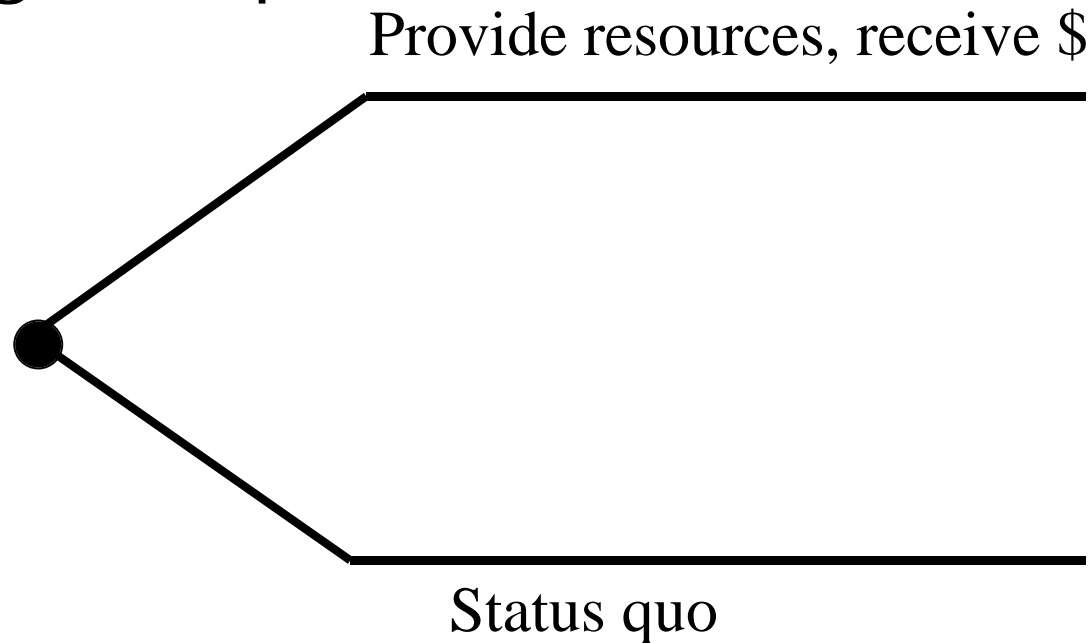
Task 2



Suppliers' Opportunity
Costs

Supplier Opportunity Cost

- To measure a supplier's increase in well-being, perform a parallel 'thought experiment':



Examples of Opportunity Cost



Computer service: Daytime versus night time service.

Undeveloped land: Land adjoining MBS.

Machine time: Scheduling in a job shop.

People time: Waiting in line for petrol.

Supplier's surplus



- Find the minimum amount of dollars the supplier would accept to provide the resource:

Opportunity Cost

- The increase in the supplier's well-being is:

Price received

minus

Opportunity Cost

Opportunity Cost: Examples



- The opportunity cost of a resource is often found by looking at the 'best alternative use' of that resource (hence the term)

- Examples:

- Alternative employment opportunities

- supplying capital:

$$\text{Payoff} > 1 + r$$

$$-1 + \text{Payoff}/(1 + r) > 0$$

Economic Profit



- This example highlights the difference between economic and accounting profit.
 - Accounting profit is aimed at determining how much money your business earned.
 - Economic profit uses opportunity costs rather than accounting costs. It is aimed at forecasting the returns from different decisions.
 - Sunk costs do not represent opportunity costs.
 - Thus, *choice should be guided by economic rather than accounting notions of profit.*
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Recap



- Focus on creation of value (rather than price)
 - Total value = $WTP - OC$
 - WTP & OC are formal concepts
 - Determining WTP requires objective and subjective criteria
 - Economic profit uses OC rather than accounting costs
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Looking Forward



- Examples of opportunity cost (Case 1-2)
- Finding opportunities to create value
 - Specialisation
 - Make or buy

Tough bikkies ...



- Caroline baked excellent chocolate-chip biscuits in the Midwestern US.
- She wanted to market them to supermarkets.
- However, she ran into the practice of 'slotting.' Caroline was charged a high fee just to place products on the shelves. These prices ranged from \$3,000 to \$25,000. Also, had to buy back items unsold.

■ Caroline complained on '60 Minutes' about

... response



■ Supermarket manager:

"I run a good store. Each yard of shelf space in my store generates about \$10,000 in sales every week! If I put a new product on a yard's worth of shelf space, and if it fails to sell well, I lose those \$10,000 in sales. That is the real cost to me, just as if I had taken money out of the safe or written a check. It is a cost even if I get the new product for nothing or sell it on consignment. It is a cost, because

Case 1-2



Sport Obermeyer

Cost Concepts for Firms



- What costs can be *avoided* by not producing ...
 - an extra unit of output (Marginal Cost)
 - at all (Fixed plus Variable Cost)
 - in the first place (Sunk plus Fixed plus Variable Costs)
 - today (Interest earnings on expenditures)
 - Importance of time horizon and magnitude of decision
-

Costs at the Margin



- Critical to any cost decision are the notions of *incremental* or *marginal* cost

How much will it cost me to produce one additional unit of my product, or to supply one more unit of my service?

Example: Flight Services



- Consider people flying from Paris to Edinburgh for a Rugby International. Traffic is overwhelmingly in one direction on that particular weekend.
 - An Air France marketing manager realised that there were many residents of Edinburgh who might like a weekend in Paris. Offered substantial discounts for this direction (e.g., £50 instead of the usual, £300. Now the reverse flights were full.
-

Example continued...



- Air France's profits were much higher. Why?
 - The additional or marginal cost of carrying the passengers to Paris was very small, a little extra fuel and a cup of coffee. Much less than £50.
 - The plane would have to go back anyway, so its use is not an opportunity cost.
-

Two Types of Costs



- Attributable Costs: extra fuel and food is caused by additional passengers
 - Economies of Scope: passengers on each direction are complementors (on the supply side) -- who should bear these costs?
-

Thought Experiment



- “If two independent parties owned the outward and return legs respectively, or if Air France were to auction the rights to these, what cost allocation would they agree to?”
 - Appropriate allocation depends on the relative demand for the products and not simply on engineering characteristics. The technical characteristics of the services are identical.
 - Causality of costs is determined by demand.
 - As a stand alone product, £50 per passenger is unprofitable. But considering both legs it is not.
-

Summary



- Marginal costs are critical in determining the costs of output expansion.
 - In the Air France case, whether to expand output on the return leg (by offering a discount) depended on marginal and not average or total costs.
-

Finding Opportunities to Create Value



- Specialisation
 - Make or buy
 - Complementarities
-

Trade with many units



- Consider trade between two consumer-producers.
 - Should they self provide or trade?
 - On what basis do we decide who should produce what?
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Interdependence and Trade:

“A Parable for the Modern Economy”

Imagine...

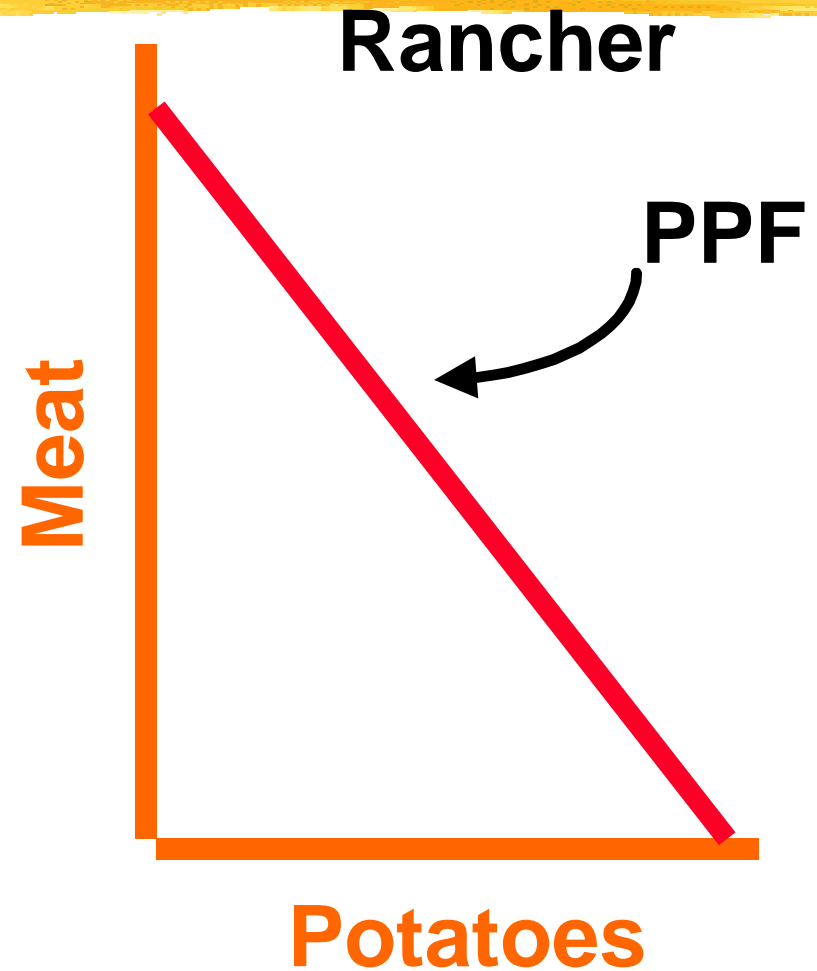
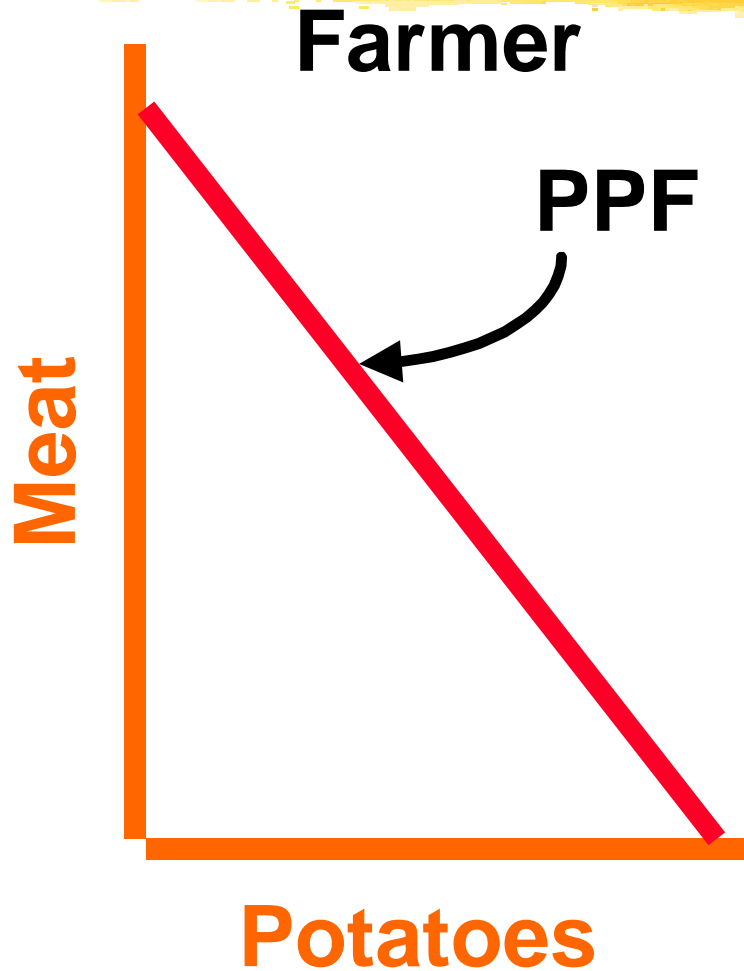
... only two goods (potatoes and meat)

... only two people (potato farmer and a cattle rancher)

What should each produce?

Why should they trade?

A World of *Self-Sufficiency*

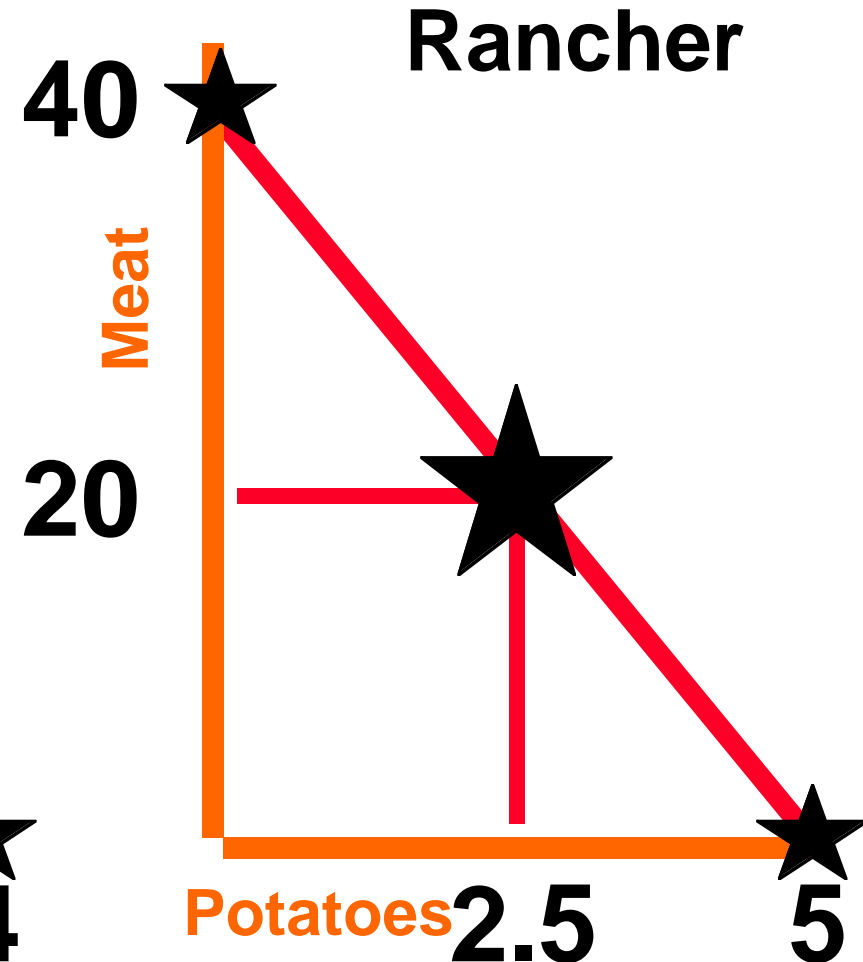
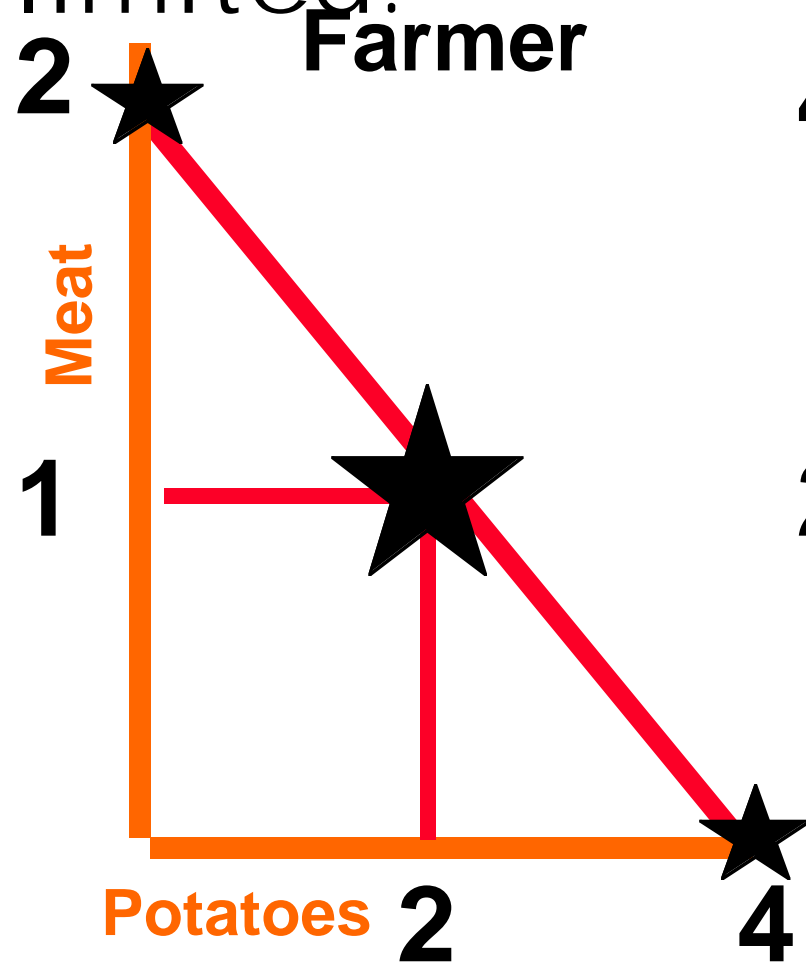


A World of *Self-Sufficiency*



- By ignoring each other:
 - the farmer and rancher will produce a limited amount of meat and potatoes.
 - each consumes what they each produce.
 - each is subject to tradeoffs between meat and potatoes.
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Self-Sufficiency: without trade, economic gains are limited.



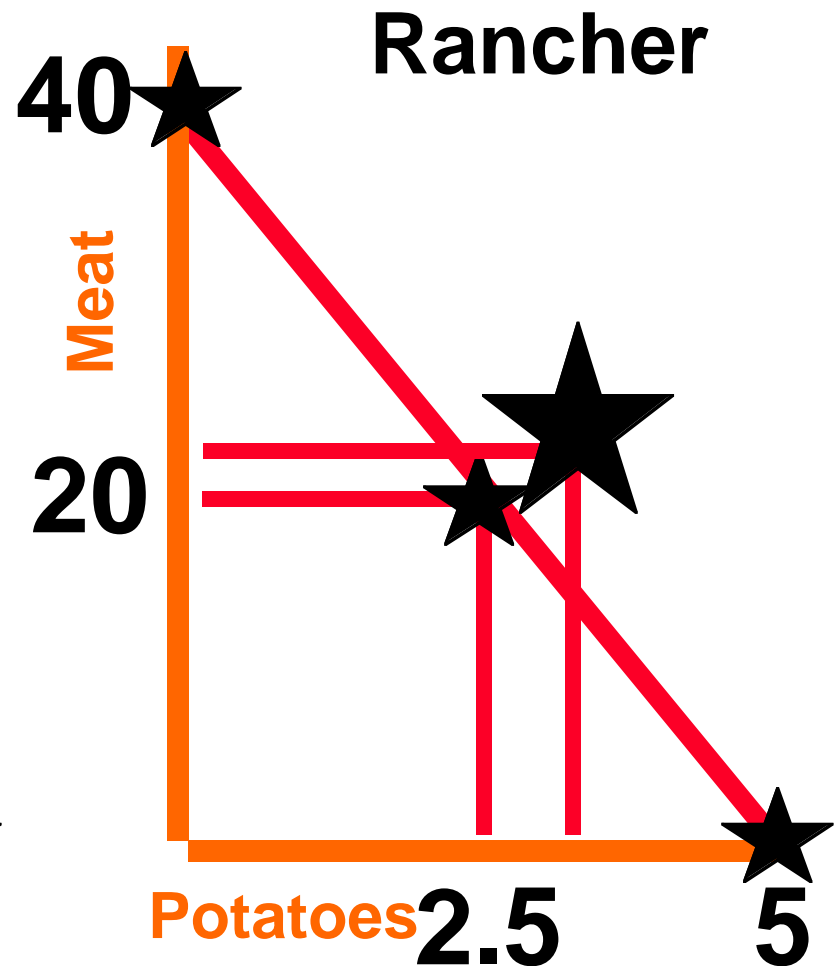
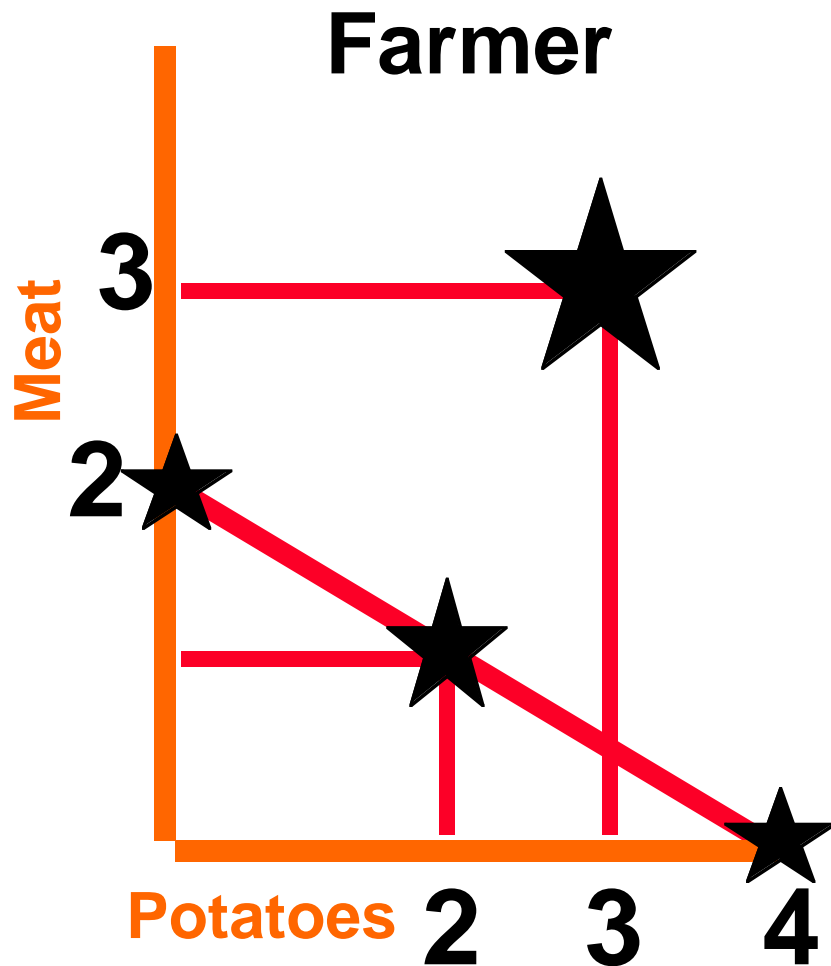
Specialisation and Trade

[Table & Figure in notes]



- If the farmer and the rancher were to *specialise in producing* the product that they were more suited to produce, and then *trade* with each other, they would be better off.
 - Farmer should produce potatoes.
 - Rancher should produce meat.
 - Farmer and Rancher should trade.
-

Joint Production Possibilities



Should they trade?



- *Absolute advantage*: to produce a pound of potatoes the rancher needs 8 hours whereas the farmer needs 10 hours. Choose the rancher?
 - No, must consider the rancher's opportunity cost: if produces one pound of potatoes, the rancher cannot produce 8 pounds of meat.
 - Farmers opportunity cost is only 1/2 pound of meat. It is lower than the
-

Comparative Advantage



- Comparative advantage tells us who should produce what.
 - Who faces the lower opportunity cost of producing meat?
 - What relative price would achieve this?
 - Suppose that three pounds of meat exchanges for one pound of potatoes.
 - Compare price with opportunity cost.
-

Applications



- Should Michael Jordan mow his own lawn?
 - Should one partner stay home while the other works?
 - Should Australia trade with other countries?
-

Transfer Pricing



- In an attempt to allocate costs to departments effectively, Bellcore uses a system of transfer pricing. In the late 1980s, the transfer price for typing reports reached as high as \$50 per page, due to the way that overhead costs for space, electricity, employee travel, parking and so on were allocated. [See "Getting Transfer Prices Right: What Bellcore Did?" *Harvard Business Review*, (Sept-Oct, 1989), pp.146-154]
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Make versus Buy



- General principle: a firm should make rather than buy if the opportunity cost of doing it yourself is less than the price you would pay for the service in the market place.
 - Has this principle been applied to outsourcing decisions in your organisation?
-

Exploiting Complementarities



A different way of locating valuable trade is searching for other activities that, if added to your own, create value

Air and Land



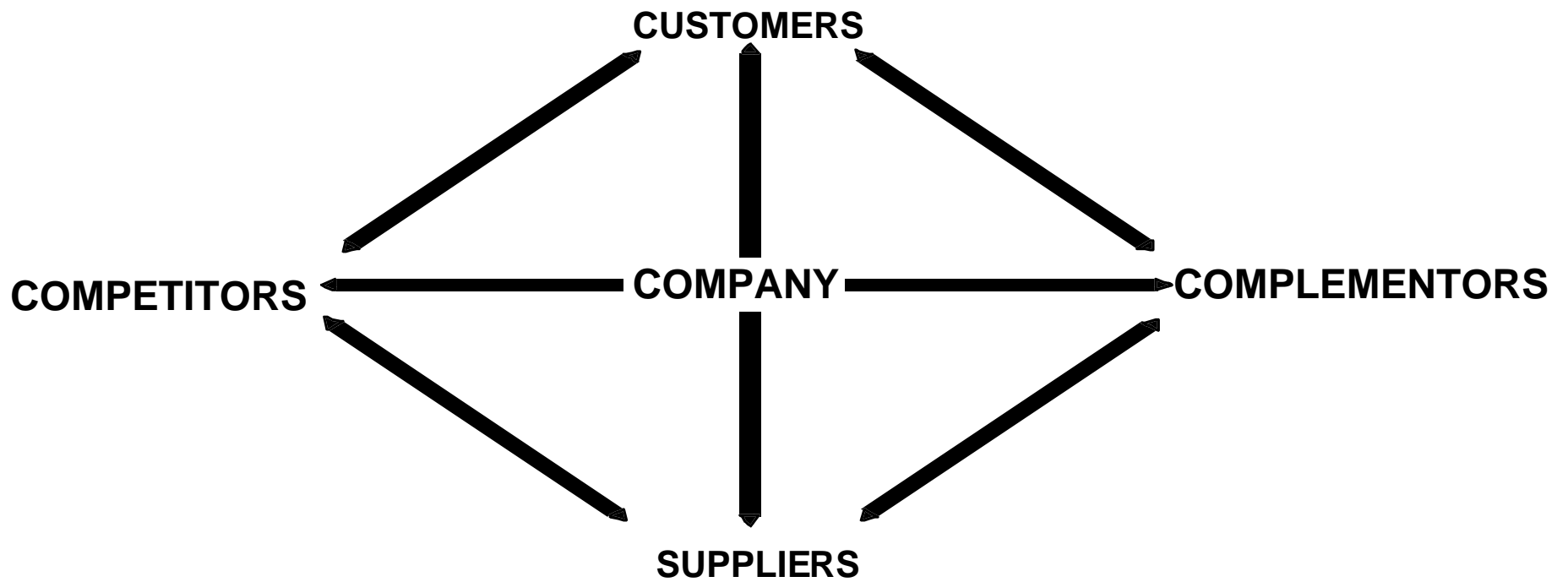
- Hotels need airlines, airlines need hotels
 - Allied or conflicting interests?
 - Consumer cares about $p_a + p_h$
 - Each firm wants the other to be cheap
-

Complementary



- Providers of complementary products and services
 - *Hardware and software*
 - *Cars and car loans*
 - *VCRs and Showtime*
 - *Intel and Windows*
-

The Value Net



Competitors & Complementors



A player is your complementor if customers value your product more when they have the other player's product than when they have your product alone.

A player is your competitor if customers value your product less when they have the other player's product than when they have your product alone.

Complementor: Technical definition



- Two firms are complementors if, to a customer:

$$WtP (A + B) > WtP (A) + WtP (B)$$

- Examples

- *cars and roads*
 - *Hallmark and Valentines Day*
 - *Desktop printers and digital cameras*
 - *Impeachment and CNN*
-

What business is RACV in?



- roadside assistance?
- insurance
- travel
- buying club
- financial products

Complementary businesses

Creating complementors



■ Common funds

- 1913: GM, Hudson, Packard created the Lincoln Highway Association to fund 'seeding miles'
- Today: Compaq, Sun, Netscape and Oracle provided a \$100m Java development fund.

■ Bundling: solve conflict over pricing

- *Software applications, Textbook and AFR, cinema and food at Jam Factory*
-

Complementors & Competitors: The Supply Side



A player is your complementor if it's more attractive for a supplier to provide resources to you when it's also supplying the other player than when it's supplying you alone

A player is your competitor if it's less attractive for a supplier to provide resources to you when it's also supplying the other player than when it's supplying

Complementor: Technical definition



- For suppliers,

$$OC(A+B) < OC(A) + OC(B)$$

- Economies of scale and scope
 - Peak and off peak
 - *cricket and football*
 - *network usage*
-

The Supply Side:

Examples



Compaq & Dell

compete with each other for the latest Intel chip

complement each other in defraying Intel's R&D costs

Qantas & Ansett

compete with each other for landing slots and gates

complement each other in defraying Boeing's R&D costs

Multiple Roles:

Jekyll and Hyde



- Competitive threat or complementary opportunity?
 - *Movie theaters & video rentals*
 - *Traditional & Internet booksellers*
 - *Computers and paper: "paperless" office*
 - *ATM machines - the fate of Citibank*
 - *Sony and Connectix*
-

Multiple Roles:

Making Markets



*Antique stores on High Street,
Armadale*

*Theater, music, & dance on and off
Broadway*

Supermarkets and hot bread stores

Complementors in making
the market

Competitors in dividing

Friend or Foe?



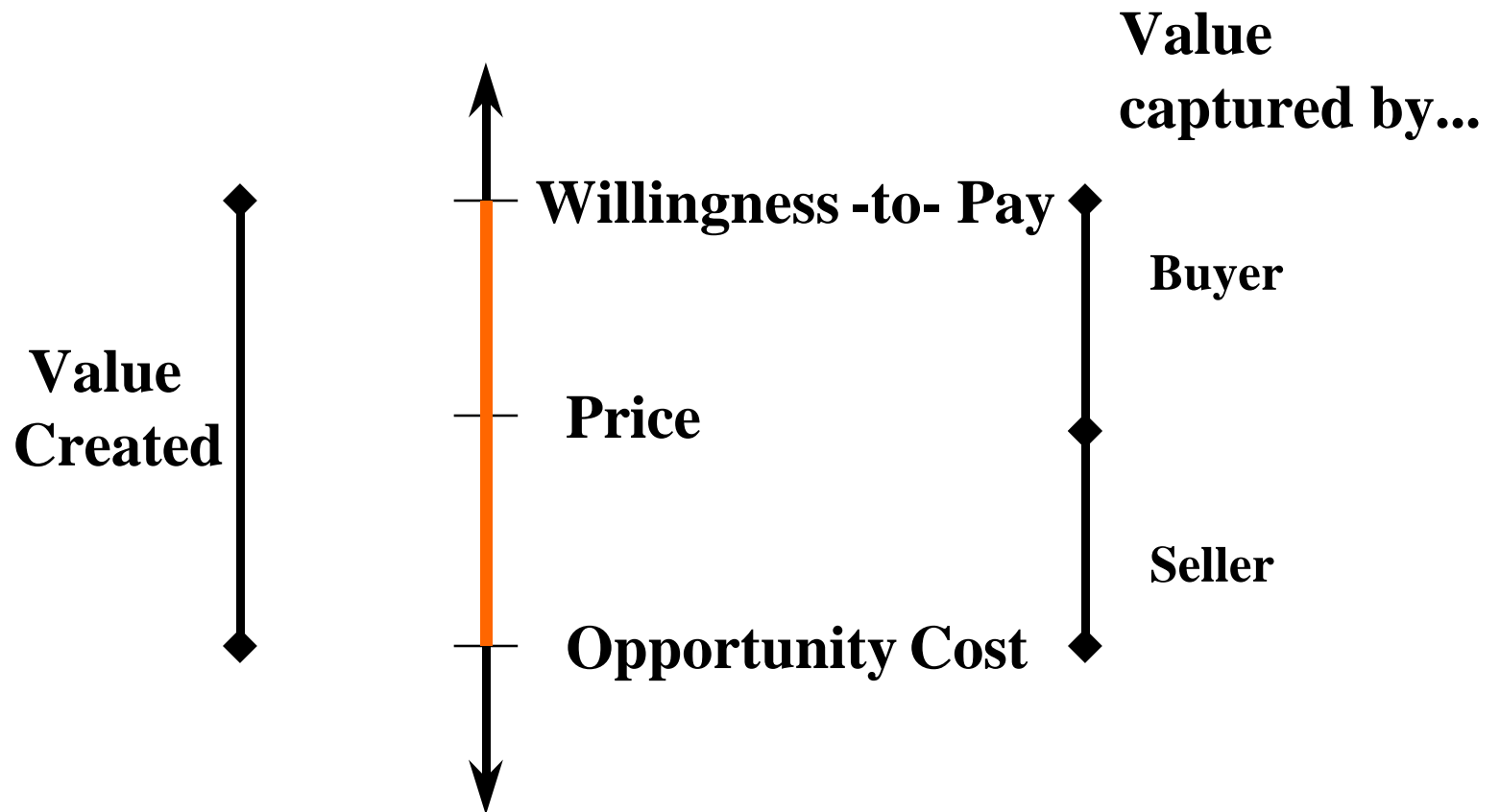
Friends

Customers, Suppliers,
Complementors

Foes

Competitors

The Division of Value



Back to Added Value



- Price measures the division of value between business and customer
- Cost measures the division of value between business and supplier
- What determines these divisions of value?

Added Value

Summary



- The size of the pie

Willingness-to-Pay

minus

Opportunity Cost

- The division of the pie:

Added Value

- The next step: what happens if you cannot cooperate to maximise value created?
-