


School of Business,
Economics and Law
GÖTEBORG UNIVERSITY

Markets

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Outline of my part

1. Why markets?
   - Comparative advantage, opportunity cost, double coincidence of wants
2. Partial equilibrium I
   - Definition + Computing equilibrium
3. Partial equilibrium II
   - Rationale + Comparative statics
4. General equilibrium I
   - Walras law, Efficiency

Outline of my part

5. General equilibrium II
   - Inequality, redistribution and tax distortions
6. Public goods
7. Externaliteis

Advice

- Solve problems
  - Little to read
  - Replicate lectures
- Why so much formal analysis?
  - Deeper understanding (but requires a big effort)
  - For all: Need to be able to read scientific papers, also theory
  - For some: Preparation for Ph.D. studies

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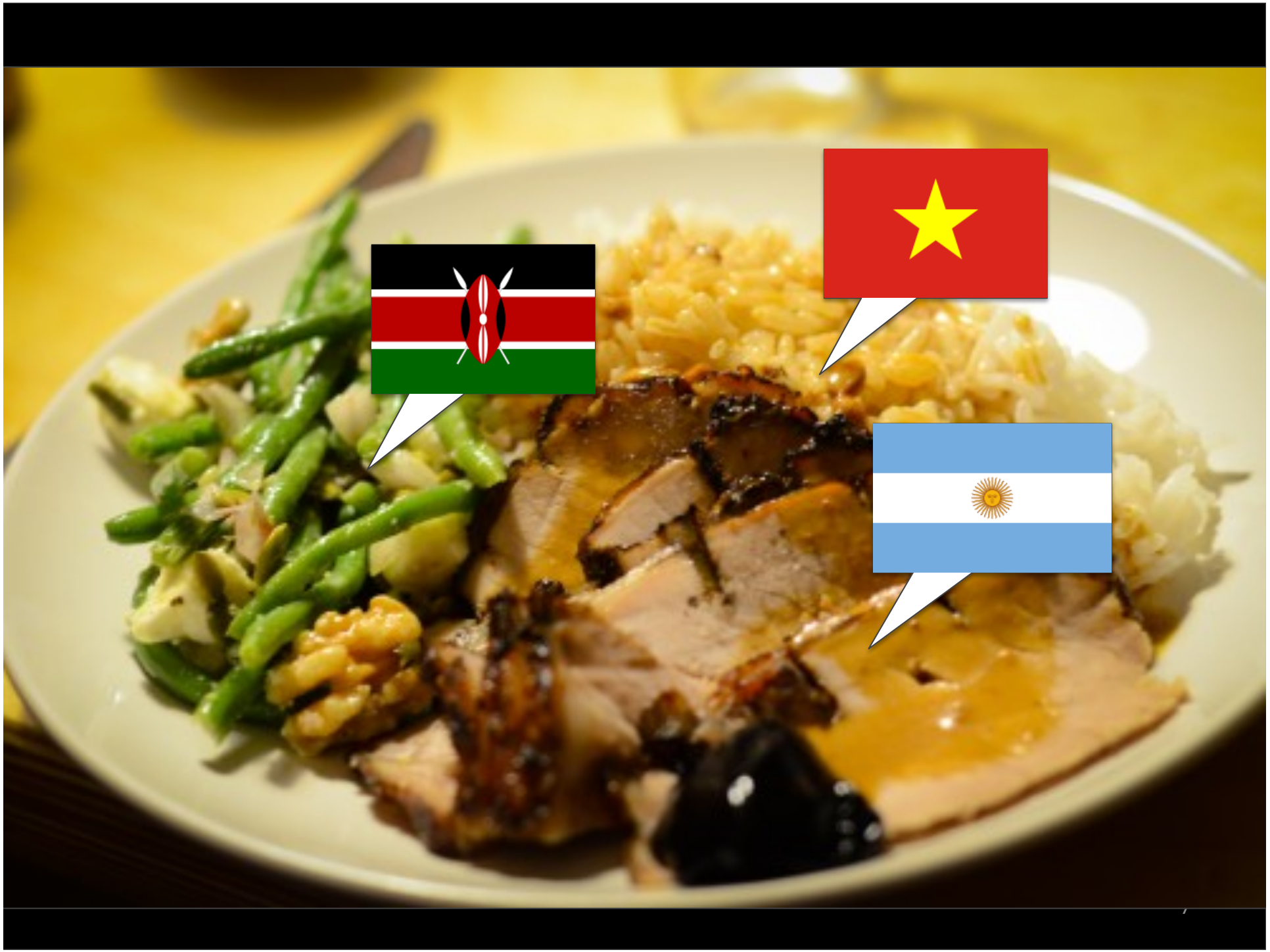
Why Markets?

Lecture Notes

Johan Stennek




Vietnam White Rice
HIGH QUALITY
Produced by


How where all those
people aligned to
produce this meal?

But, lets start from the beginning….

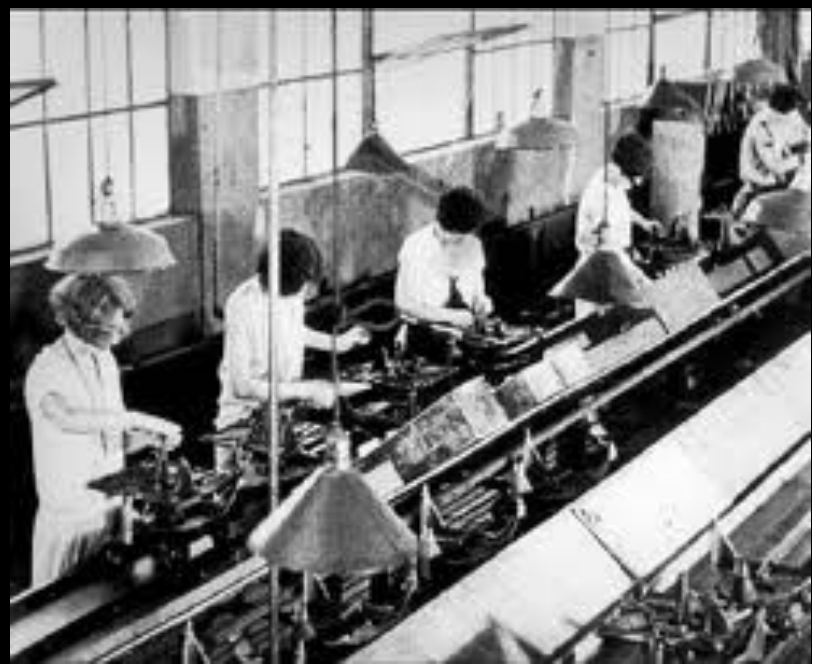
….why don’t we simply eat what we produce

Love of variety

we want a little of this
and a little of that

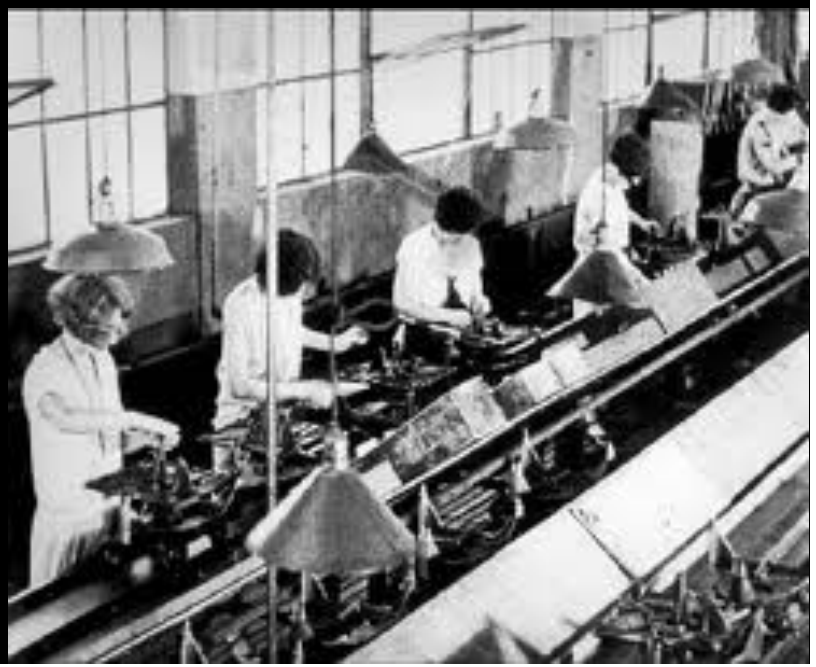
Returns to specialization

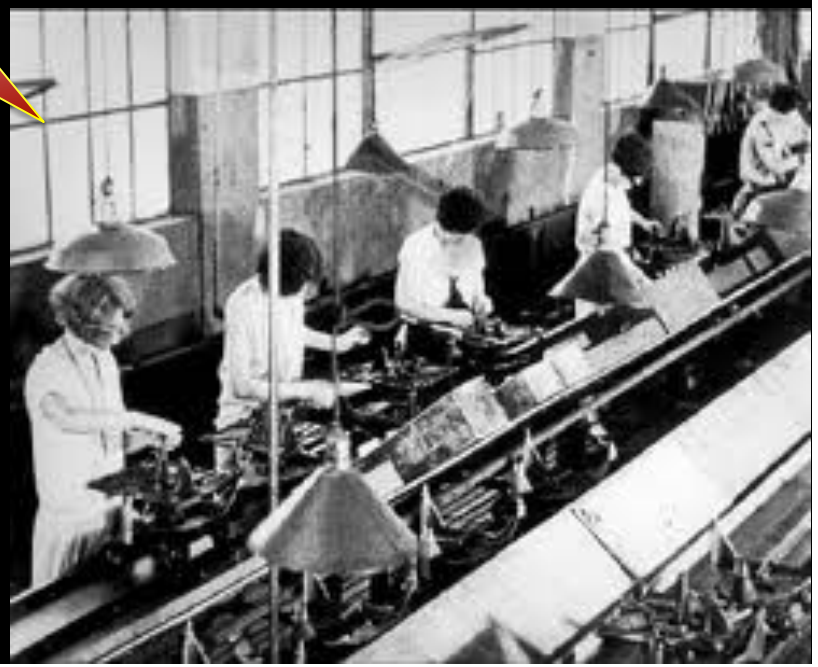
Do what we are good at
and learn



Love of variety

Returns to specialization






BNP
PAR
BNP PARIBAS
BOSS
BNP PARIBAS

Fundamental Economic Problem:

1. Exchange - Under what conditions (more precisely) do we gain?

2. Coordination - How do we know that
   - somebody else produces what we wish to eat
   - somebody else wishes to eat what we produce


INTRUDER
KEEP OUT!!!
THE DOG HOUSE COLLECTION

Why Markets?

- Why Exchange?

Why Markets?

- Purpose: understand why
  1. Love of variety
  2. Returns to specialization
  - ➢ Exchange
- How?
  - Build a model
  - Model = an "imaginary economy"
  - Do imaginary experiments

Model 1

Why Markets?

- Basic assumptions
  - Two people: Anderson & Peterson
  - Two goods: Apples & Pears
  - Resource constraint
    - Work 1500 hours per year
    - No disutility of working

Why Markets?

- Love of variety
  - People derive utility from consuming fruit
  - But only in *pairs* (= fruit salad)
    - 1 apple + 2 pears is as good as 1 apple + 1 pear
    - To enjoy a 2nd pear, I need a 2nd apple
  - Extreme (perfect complements)

Why Markets?

- Perfect complements ≠ Love of variety
  - Caricature
  - Makes model *easy to analyze* without a lot of math
  - Qualitative conclusions do not hinge on this simplification

Why Markets?

- Returns to specialization
  - Maximum production per hour:

	Apples	Pears
Anderson	2	1
Peterson	1	2

  - Absolute advantage
    - Anderson – apples
    - Peterson – pears

Why Markets?

- Question 1
  - How many apples and pears would Anderson and Peterson produce and eat, if they could not exchange fruit with one another? (3 minutes)

  - Recall
    - 1500 hours per year
    - Eat fruit in pairs
    - Anderson produces 2 apples or 1 pear per hour
    - Peterson 1 2

Why Markets?

- Answer 1
  - Anderson always produces the same number of apples and pears in order to consume even pairs
  - He has to work 1.5 hours to produce one pair
  - Since he works 1500 hours, he will produce and eat 1000 apples and 1000 pears
  - Also Peterson will produce and eat the same number of apples and pears.

Why Markets?

- Question 2: Someone suggests Anderson should give an apple to Peterson for some amount of pears
  - How many pears would Anderson at least require from Peterson in exchange for one apple?
  - How many pears would Peterson at most be prepared to give Anderson in return for one apple?
  - (5 minutes)

Why Markets?

- Anderson
  - Producing one more apple takes ½ hour
  - Must produce ½ pear less
  - Anderson requires at least ½ pear in exchange for an apple

Why Markets?

- Same thing more rigorously:
  - When Anderson gives away 1 apple, he can work 1599.5 hours to produce fruits for his own consumption
  - If Anderson receives X pears in exchange, he would produce equally many apples to form even pairs, which takes X/2 hours.
  - The rest of the time he produces even pairs (which takes 1.5 hours per pair)
  - Anderson's total consumptions of pairs: $\frac{1499.5 - \frac{X}{2}}{1.5} + X = 1000$
  - X = ½

Why Markets?

- Peterson
  - Producing one apple less frees 1 hour
  - Can produce 2 pear more
  - Peterson is willing to give 2 pears in exchange for an apple

Why Markets?

- Answer 2
  - Anderson demands ½ pear in return for 1 apple
  - Peterson willing to give 2 pears in return for 1 apple

Why Markets?

- Question 3
  - Anderson and Peterson agree (for some unexplained reason) to trade the fruit one for one.
  - How many fruits will they trade?
  - Expressed differently, how many apples and pears will Anderson and Peterson produce and eat?
  - (3 minutes)

Why Markets?

- Answer 3
  - Let Anderson and Peterson specialize completely
  - Anderson spends all time producing apples; In total 3000 apples
  - Peterson spends all time producing pears; In total 3000 pears
  - Exchanging 1500 apples and pears, both people will be able to eat 1500 fruit-pairs

Why Markets?

- Question 4
  - Compare the two outcomes.

Why Markets?

- Answer 4
  - Without exchange: Each eat 1000 fruit pairs
  - With exchange: Each eat 1500 fruit pairs

  - GDP increased by 50%
  - Growth,
    - not by technical progress,
    - not by investment
    - but by organizational progress

Why Markets?

- Question 5
  - What happens if Anderson specializes in apples, but Peterson produces both apples and pears?

Why Markets?

- Answer 5 (Exchange after production)

		Peterson		
		Produce 1500 Apples	Produce 1000 Apples and Pears	Produce 3000 Pears
Anderson	Produce 3000 Apples	0, 0	0, 1000	1500, 1500
	Produce 1000 Apples and Pears	1000, 0	1000, 1000	1000, 0
	Produce 1500 Pears	750, 750	0, 1000	0, 0

Why Markets?

- Answer 5

Specializing in the wrong activity is a dominated strategy!

		Peters		
		Produce 1500 Apples	Produce 10[illegible] Apples and Pears	[illegible]ears
Anderson	Produce 3000 Apples	0, 0	0, 1000	1500, 1500
	Produce 1000 Apples and Pears	1000, 0	1000, 1000	1000, 0
	Produce 1500 Pears	750, 750	0, 1000	0, 0

Why Markets?

- Answer 5

Both specializing according to advantage => Pareto-dominating outcome.

		Peterson	
		Produce 1000 Apples and Pears	Produce 3000 Pears
Anderson	Produce 3000 Apples	0, 1000	1500, 1500
	Produce 1000 Apples and Pears	1000, 1000	1000, 0

Why Markets?

- Answer 5

BUT: Specializing according to advantage is risky – Requires *coordination*

		Peterson	
		Produce 1000 Apples and Pears	Produce 3000 Pears
Anderson	Produce 3000 Apples	0, 1000	1500, 1500
	Produce 1000 Apples and Pears	1000, 1000	1000, 0

Why Markets?

- Question for the break: What would you do?

		Peterson	
		Produce 1000 Apples and Pears	Produce 3000 Pears
Anderson	Produce 3000 Apples	0, 1000	1500, 1500
	Produce 1000 Apples and Pears	1000, 1000	1000, 0

Animal Spirits

- John Maynard Keynes: An essential ingredients of economic prosperity is confidence.
- Animal spirits are a particular sort of confidence, "naive optimism”
- For entrepreneurs in particular, "the thought of ultimate loss which often overtakes pioneers, as experience undoubtedly tells us and them, is put aside as a healthy man puts aside the expectation of death".
- John Maynard Keynes used the term to describe the gloom and despondence that led to the Great Depression and the changing psychology that accompanied recovery.

Model 2

Why Markets?

- Returns to specialization
  - Suddenly Anderson becomes 4 times more productive than before
  - Maximum production per hour:

	Apples	Pears
Anderson	8	4
Peterson	1	2

  - Anderson has absolute advantage in both fruits

Why Markets?

- Question
  - Does Anderson have any reason to trade with Peterson?
- Answer
  - Lets do the same analysis as last time

Why Markets?

- Question 1
  - How many apples and pears would Anderson and Peterson produce and eat, if they could not exchange fruit with one another? (2 min)

  - Recall
    - 1500 hours per year
    - Eat fruit in pairs
    - Anderson produces 8 apples or 4 pear per hour
    - Peterson 1 2

Why Markets?

- Answer 1
  - Anderson has to work 1.5 hours to produce 4 fruit pairs
  - Since he works 1500 hours, he will produce and eat 4000 apples and 4000 pears
  - Peterson will produce and eat 1000 apples and pears

Why Markets?

- Question 2
  - How many pears would Peterson at most be prepared to give Anderson in return for one apple?
  - How many pears would Anderson at least require from Peterson in exchange for one apple?
  - (4 min)

Why Markets?

- Anderson
  - Producing one more apple takes 1/8 hour
  - Must produce ½ = (1/8 * 4) pears less
  - Anderson requires at least ½ pear in exchange for an apple

Why Markets?

- Peterson
  - Producing one apple less frees 1 hour
  - Can produce 2 pear more
  - Peterson is willing to give 2 pears in exchange for an apple

Why Markets?

- Answer 2
  - Anderson demands ½ pear in return for 1 apple
  - Peterson willing to give 2 pears in return for 1 apple

Why Markets?

- Question 2 – follow up
  - What is the cost of producing a pear
    - for Anderson?
    - for Peterson?

Why Markets?

- Answer 2 – follow up

Productivity	Apples	Pears
Anderson	8	4
Peterson	1	2

Cost of producing a pear	Time spent	
Anderson	15 minutes	= 1/4 hour
Peterson	30 minutes	= 1/2 hour

Why Markets?

- Answer 2 – follow up

More costly for Peterson to produce pears?

Productivity	Apple	
Anderson	8	
Peterson	1	2

Cost of producing a pear	Time spent	
Anderson	15 minutes	= 1/4 hour
Peterson	30 minutes	= 1/2 hour

Why Markets?

- Answer 2 – follow up

Productivity	Apples	Pears
Anderson	8	4
Peterson	1	2

Cost of producing a pear	Time spent	Apples foregone
Anderson	15 minutes	2
Peterson	30 minutes	1/2

Why Markets?

- Answer 2 – follow up

Cost of producing a pear	Time spent	Apples foregone
Anderson	15 minutes	2
Peterson	30 minutes	1/2

  - Anderson is more productive in producing pears
  - His cost in terms of resources (time) is lower

  - Anderson's cost in terms of apples is larger
  - His ***opportunity cost*** is larger

Why Markets?

- Definition: *Opportunity Cost*
  - The cost of an activity (here: pears) in terms of the value of the best alternative that is not chosen (here: apples, rather than time).

Why Markets?

- Question 3
  - Anderson and Peterson agree (for some unexplained reason) to trade the fruit one for one.
  - How many fruits will they trade?
  - Expressed differently, how many apples and pears will Anderson and Peterson produce and eat?

Why Markets?

- Answer 3
  - Peterson can consume 1500 fruit pairs
  - Anderson can consume 4500 fruit pairs

  - DO CALCULATIONS!!!

Why Markets?

- Result: "Law of Comparative Advantage"
  - Two individuals (or firms, countries) will both gain from exchange
  - if they have different *relative* productivities (i.e. resource costs) for producing the same goods
  - even if one individual is more productive in the production of all goods (absolute advantage)
  - assuming both wish to consume a variety of goods

Why Markets?

- "Law of Comparative Advantage"
  - Firms - specialize in "core competencies"
  - Countries - specialize in producing goods requiring inputs that they have in abundance
  - Household members…
  - Football players…

Why Money?

Why Money?

- Problem with barter
  - Presumes double coincidence of wants
    - You have what I want
    - You want what I have
  - But this is rare

Why Money?

- Purpose
  - How barter causes market failure
  - How money solves market failure
- How?
  - Build a model – an “imaginary economy”

Model 1

Why Money?

- Basic ingredients
  - Economic activity is good
    - Consumption => big positive value
    - Production => small negative value
  - Need to trade
    - Nobody wants to consume what he can produce
  - Barter difficult
    - No double coincidence of wants

Why Money?

- For simplicity
  - A-people
    - Produces commodity 1
    - Consumes commodity 3
  - B-people
    - Produces commodity 2
    - Consumes commodity 1
  - C-people
    - Produces commodity 3
    - Consumes commodity 2

Why Money?

- For simplicity
  - A-people
    - Produces commodity 1
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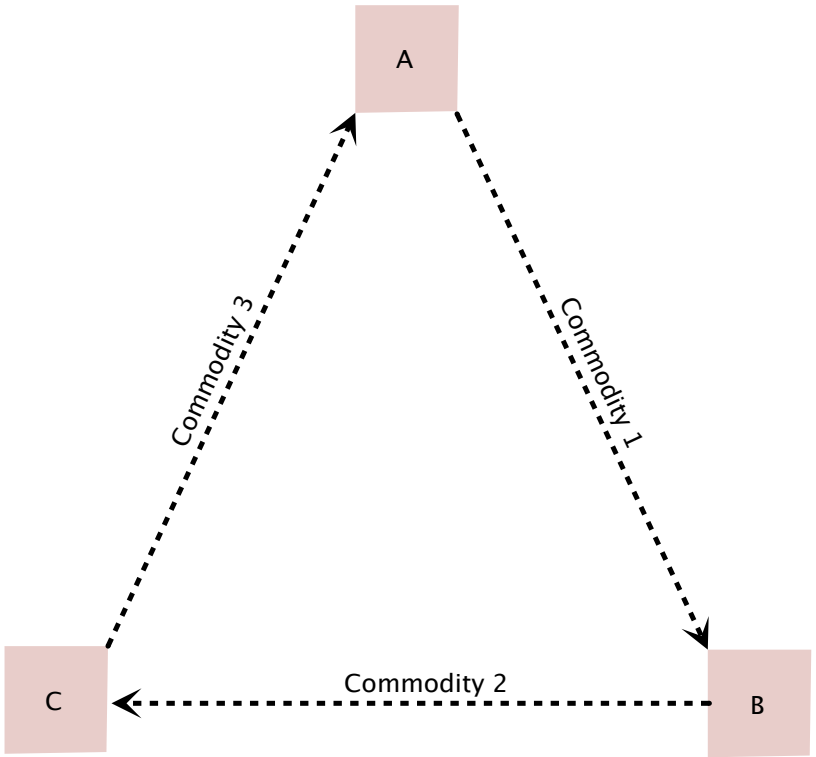
    - Produces commodity 3
    - Consumes commodity 2

Examples:
- Kidney exchange
- Rent control appartments

Why Money?



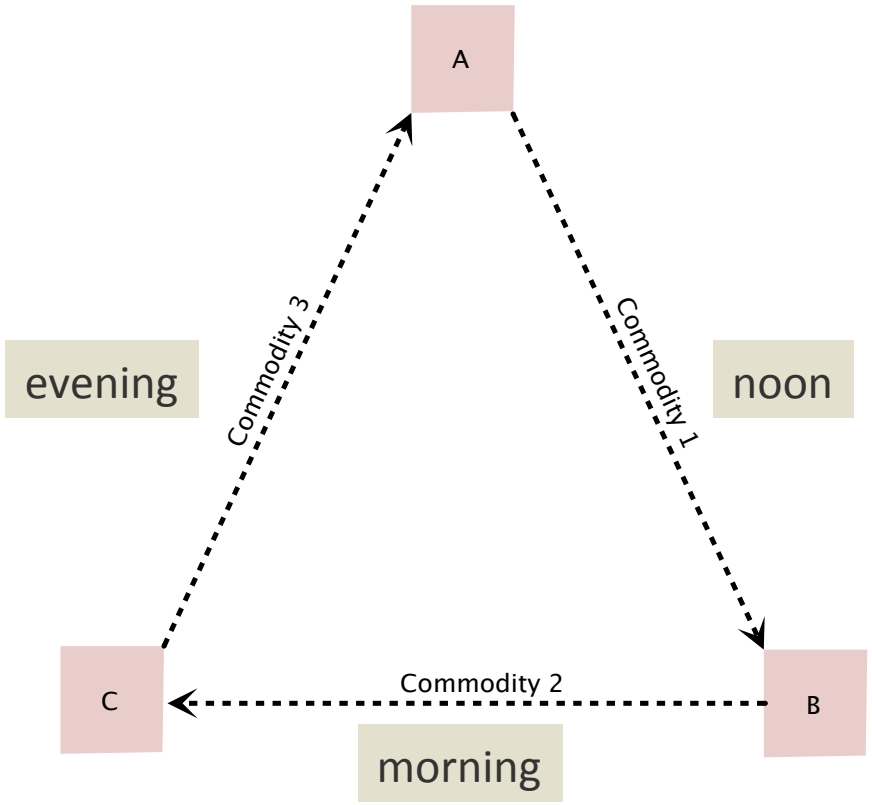
Why Money?

- Basic ingredients
  - Trade must be *bilateral*
    - People only meet in pairs (at different times)
  - Trade must be *quid pro quo*
    - You can never be sure to meet the same person again

Why Money?

- For simplicity
  - Equally many people of all types
  - Each day, every person meets with a randomly selected person from both of the other types,
  - but at different times

Why Money?


A
evening
noon
Commodity 3
Commodity 1
C
Commodity 2
B
morning

Why Money?

- Benevolent dictator
  - Order
    - Every B-person should give a C-person a unit of commodity 2 in the morning
    - Every A-person should give a B-person a unit of commodity 1 at noon
    - Every C-person should give an A-person a unit of commodity 3 in the evening

Why Money?

- Benevolent dictator
  - Result
    - Everybody would be happy

Why Money?

- Benevolent dictator
  - Result
    - Everybody would be happy
  - Q: Problem?
    - Dictators are rarely benevolent
    - Information - They don't know
      - who is good at producing what
      - who wants to consume what

Why Money?

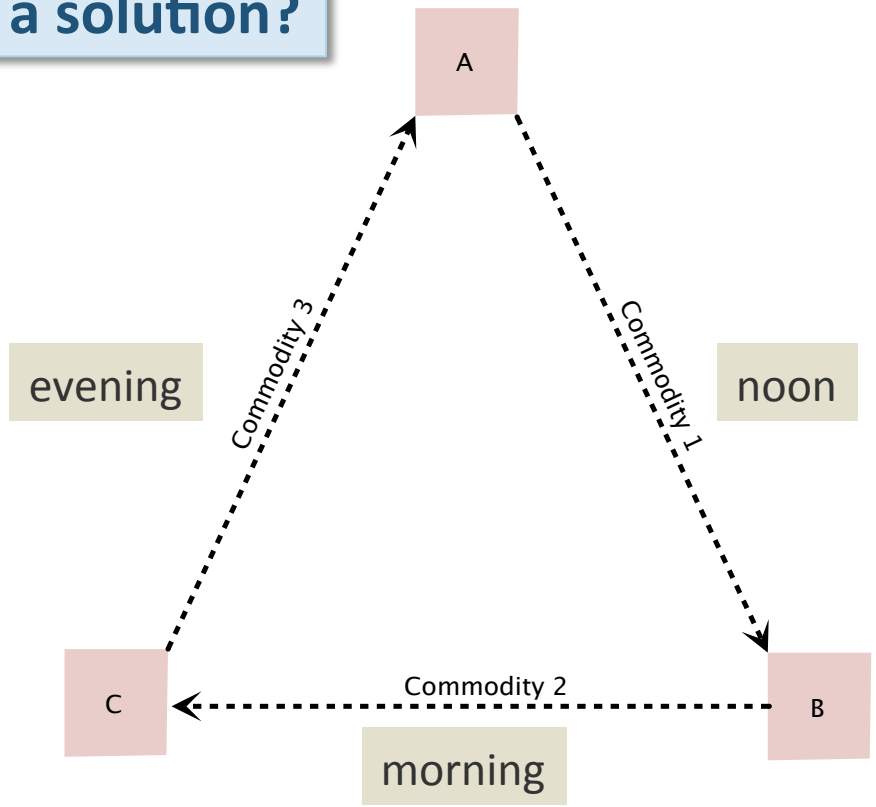
- Voluntary exchange
  - Problem
    - Only if mutually agreeable
    - No double coincidence of wants

Why Money?

- Voluntary exchange
  - Problem
    - No double coincidence of wants
    - Exchange only if both gain
  - Solution?

Why Money?

Can you see a solution?



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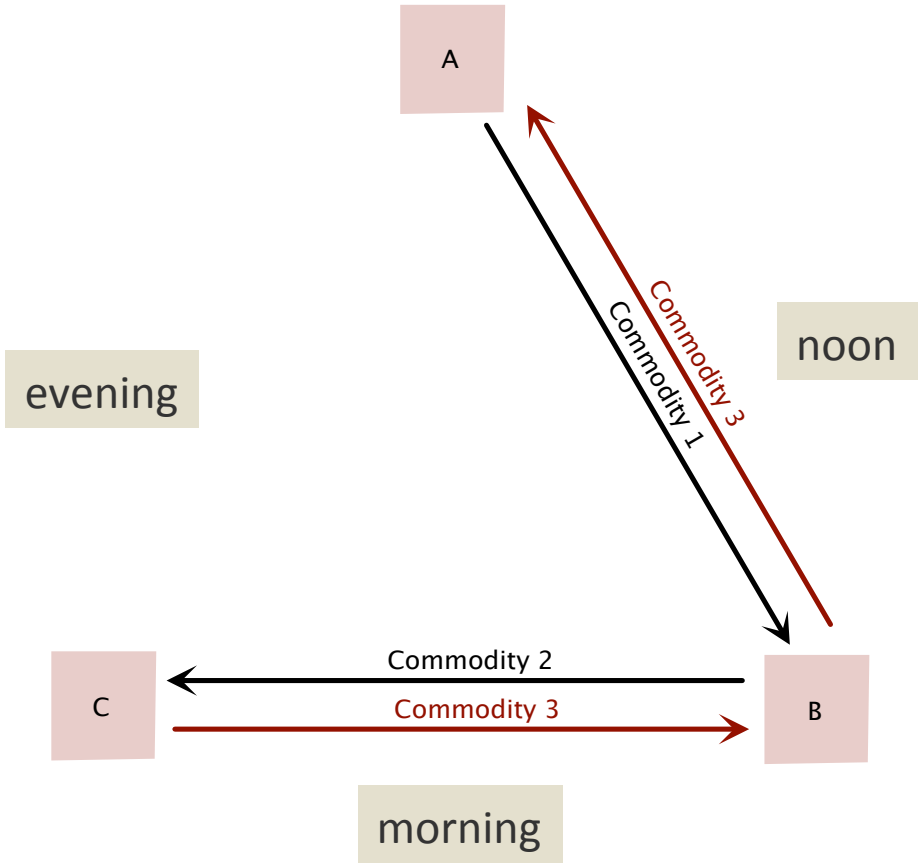
A
noon
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Commodity 1
evening
Commodity 2
C
Commodity 3
B
morning

Why Money?

- Indirect trade
  - B acts as middle-men
    - Commodity 3 has no consumption value to them
    - But it has value in trade
  - Commodity 3 is “commodity money”

Why Money?

- Indirect trade
  - Examples of commodity money
    - Cigarettes in prisons
    - Copper in the past
  - Problems
    - Storage
    - Transportation
  - Market failure if
    - Trade costs too high

Why Money?

- Conclusion - Commodity money & Indirect trade
  - May solve problem of double coincidence of wants
  - But problems of storage and transportation may result in market failure:
    - No production, trade and consumption
    - Even if everyone would be better off with it

Why Money?

- Question
  - IF
    - Dictatorship does not work
    - Indirect trade does not work,
  - Other way to make people trade voluntarily?

Model 2

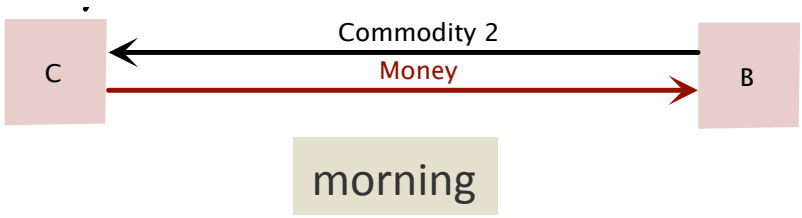
Why Money?

- Assume
  - During night someone distributes one piece of paper to every C-person
  - These are called one-euro bills
  - Bills have no consumption value
  - Creator suggests: Anyone in possession of bill leaves it in exchange for one unit of any good

Why Money?

- Claim
  - If everybody accept this idea, economic activity can start

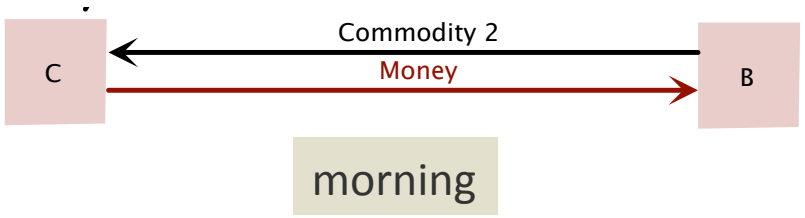
Why Money?



morning

Why Money?

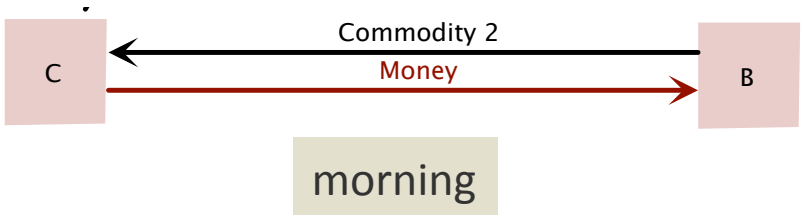
Q: But why does B accept to work for a piece of paper?



Why Money?

Q: But why does B accept to work for a piece of paper?

A: Because he *trusts* that other people will accept it in exchange for goods he likes



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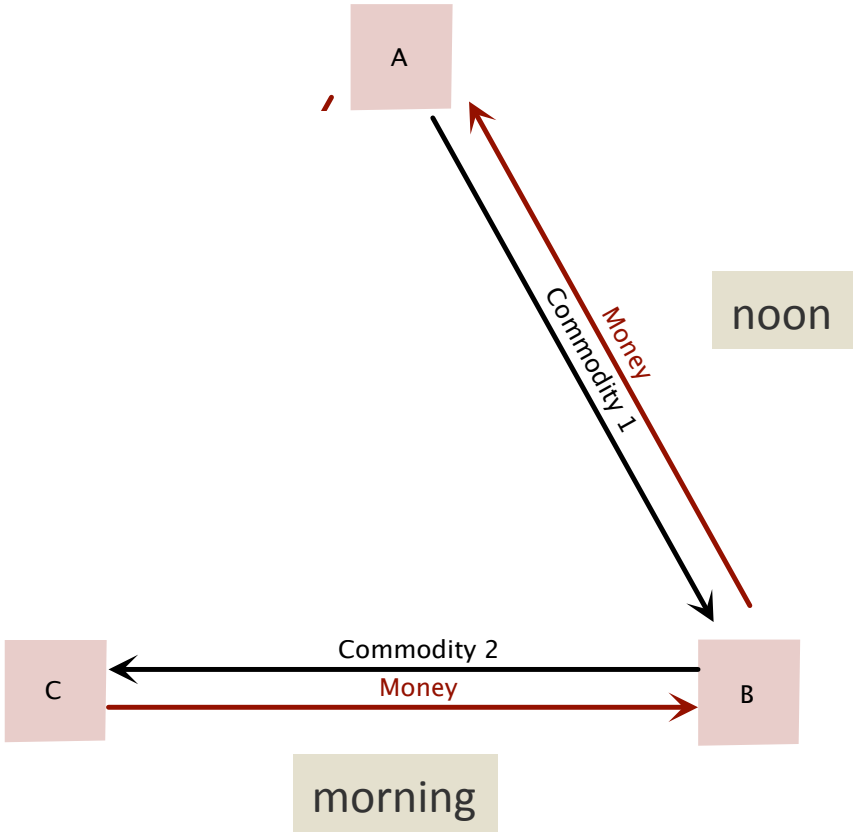
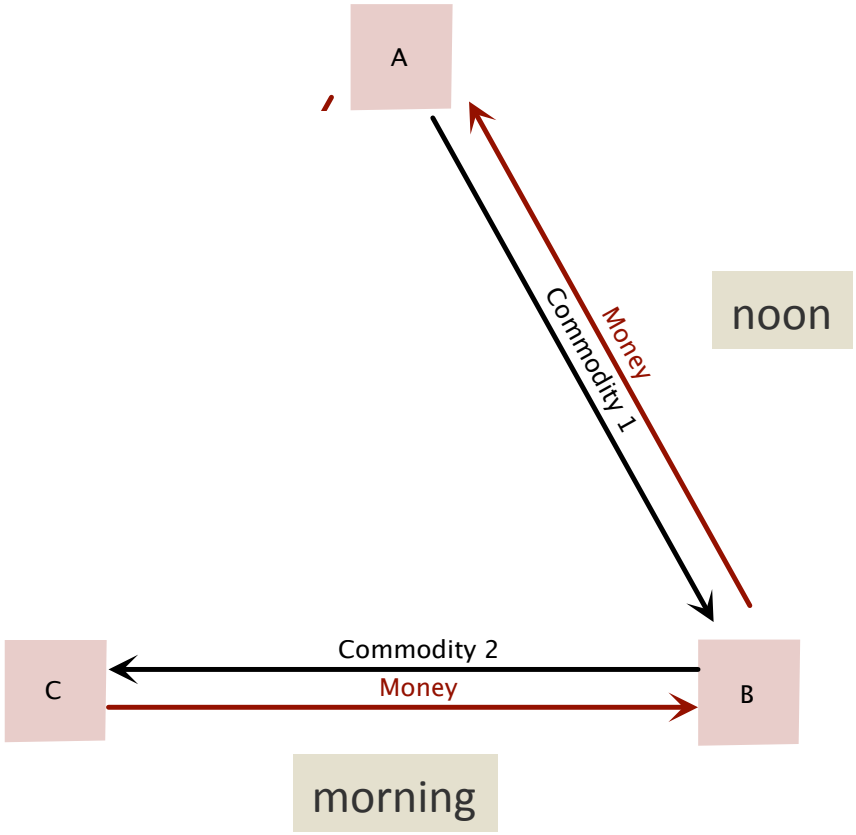


Why Money?

Q: But why does A accept to work for a piece of paper?



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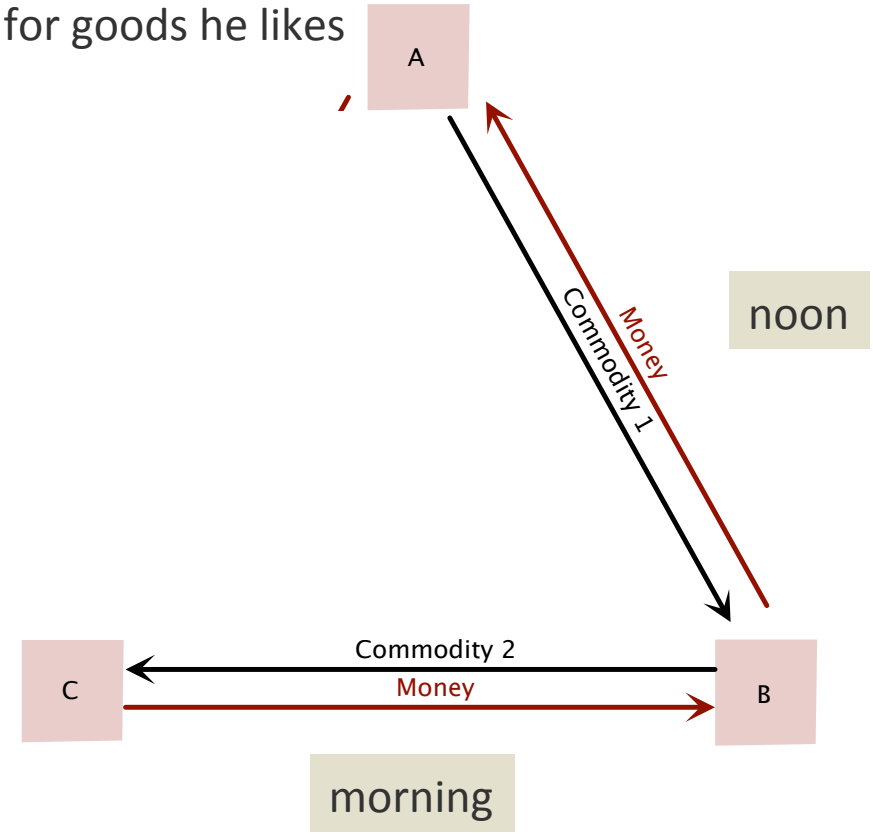

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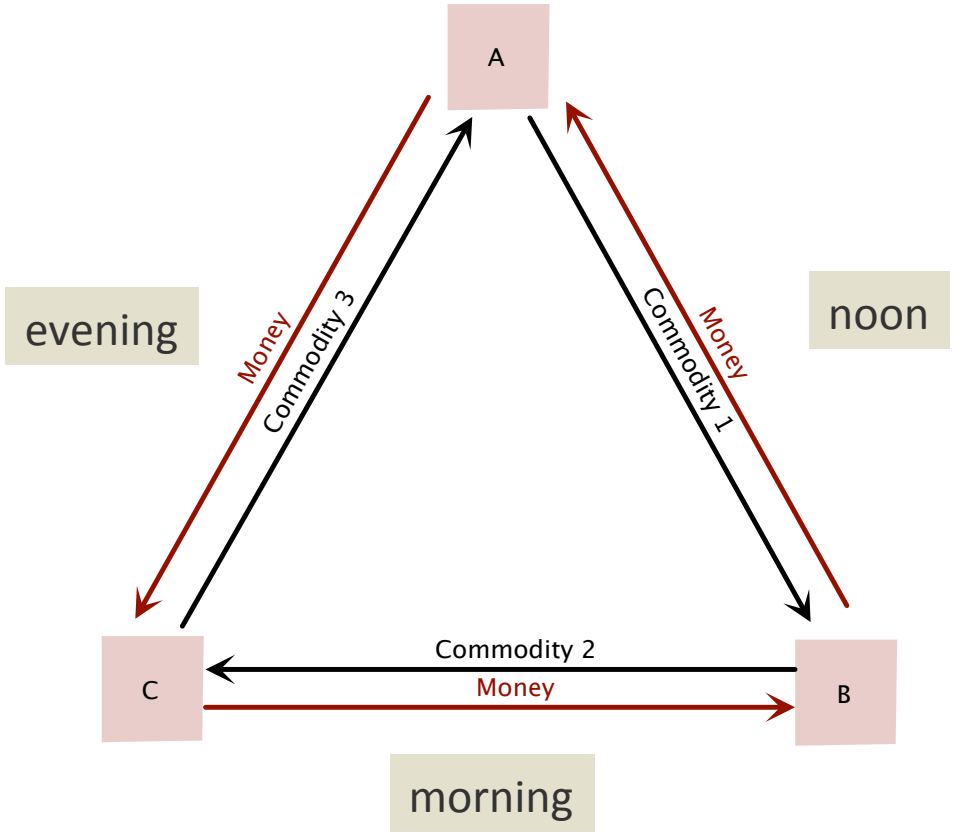
A
B
C
evening
noon
morning
Money
Commodity 3
Commodity 1
Money
Commodity 2
Money

Why Money?

- Definition: *Fiat money*
  - object with no intrinsic value
  - serving as a medium of exchange

Why Money?

- Conclusion
  - Fiat money allows trade
    - Also absent double coincidence of wants,
    - Without costs of transportation and storage
  - But…
    - Does not work if people do not *trusts* everyone else to accept money in exchange
  - Partial solution?
    - Paper money = legal tender
      - Government accepts paper money to pay taxes
      - Courts consider paper money payment as fulfillment of contractual obligations