The Workings of a Market: A Laboratory Perspective on Economic Systems

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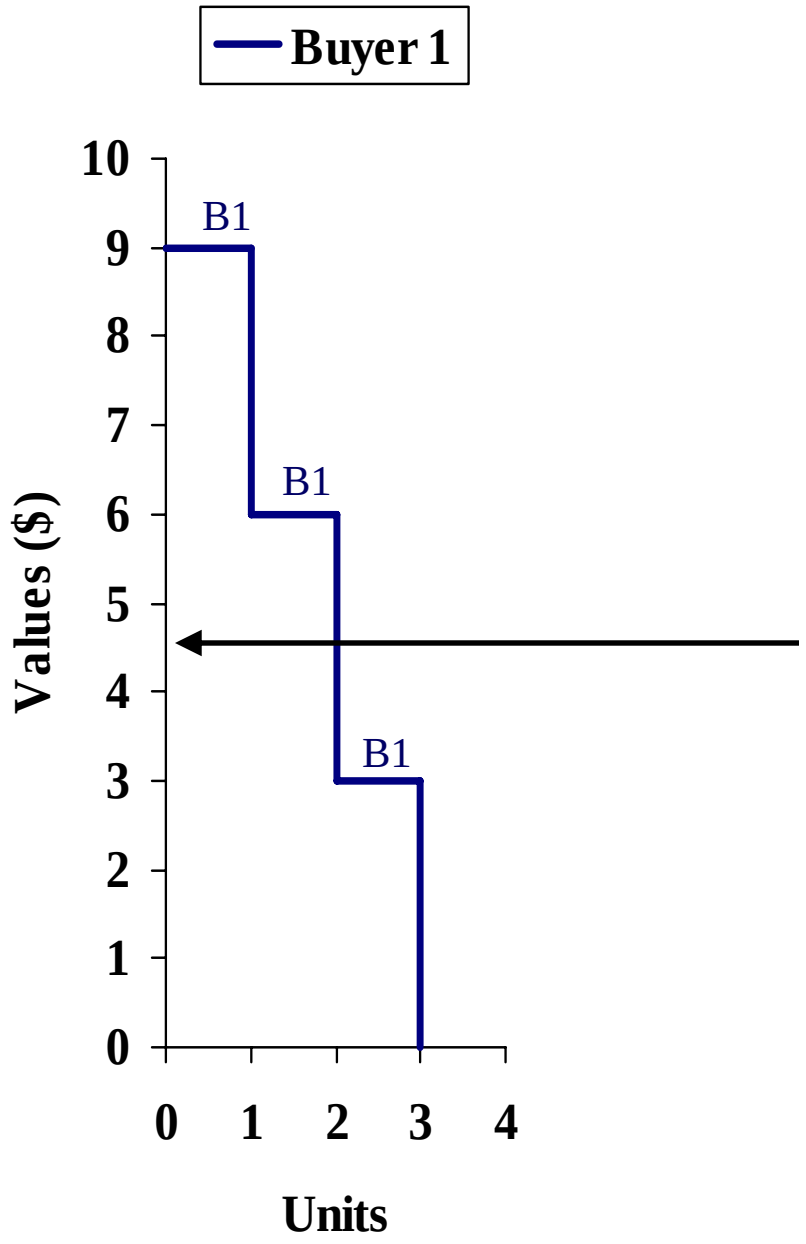
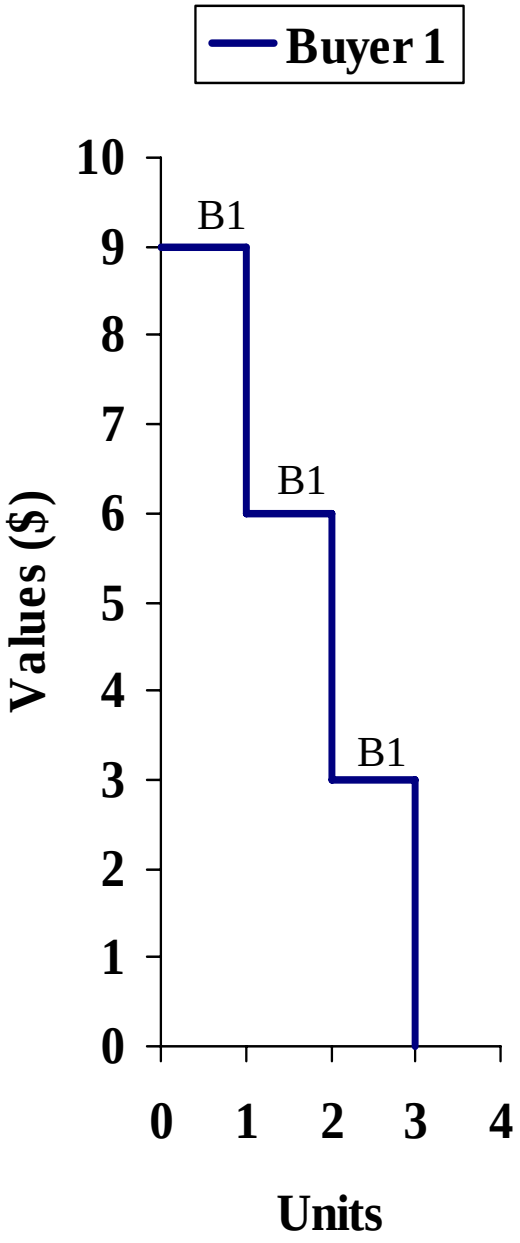


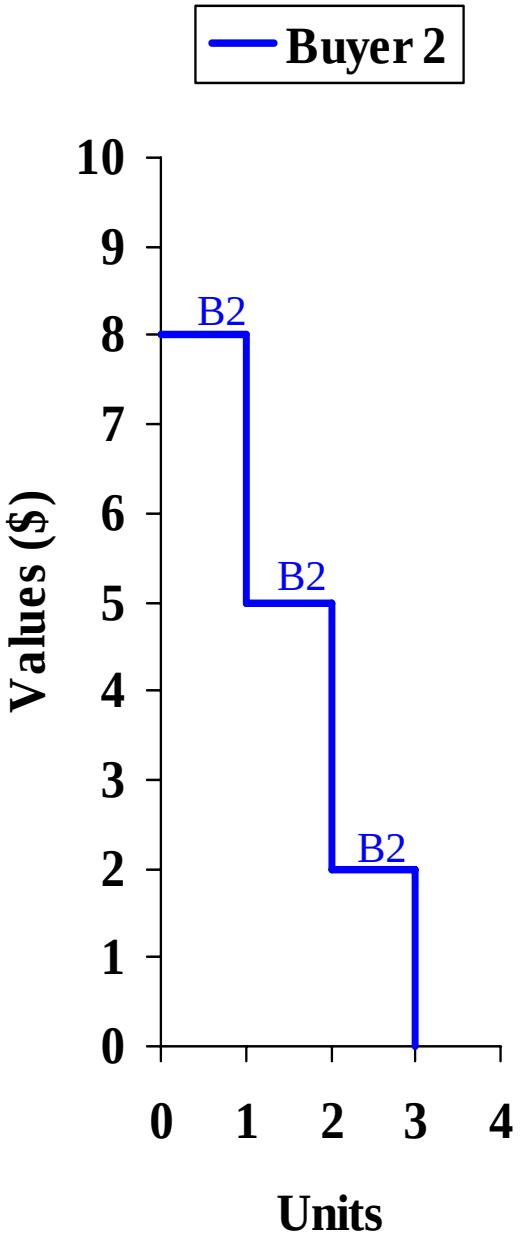
Buyer 1	
Unit	Value
1st	$9
2nd	$6
3rd	$3

Buyer 1's Demand

At a price of $4.50, how many units is Buyer 1 willing to purchase?

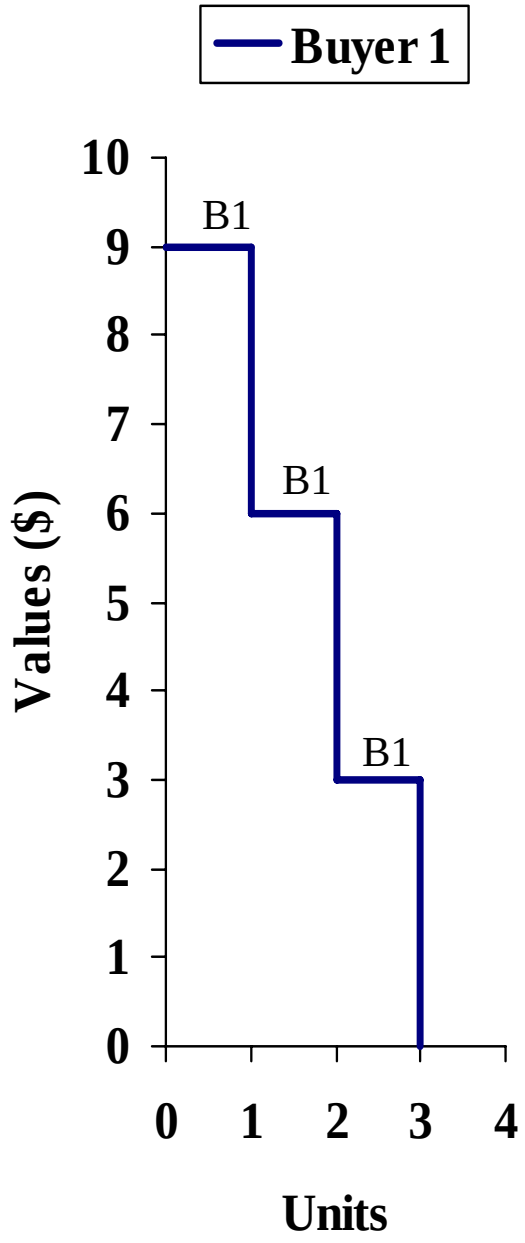
Two

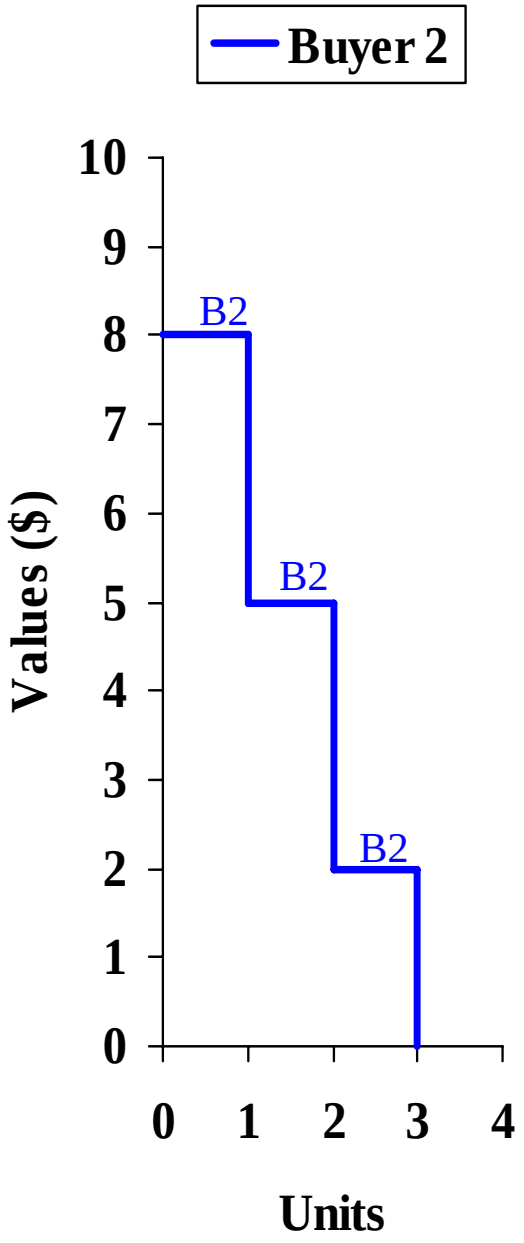




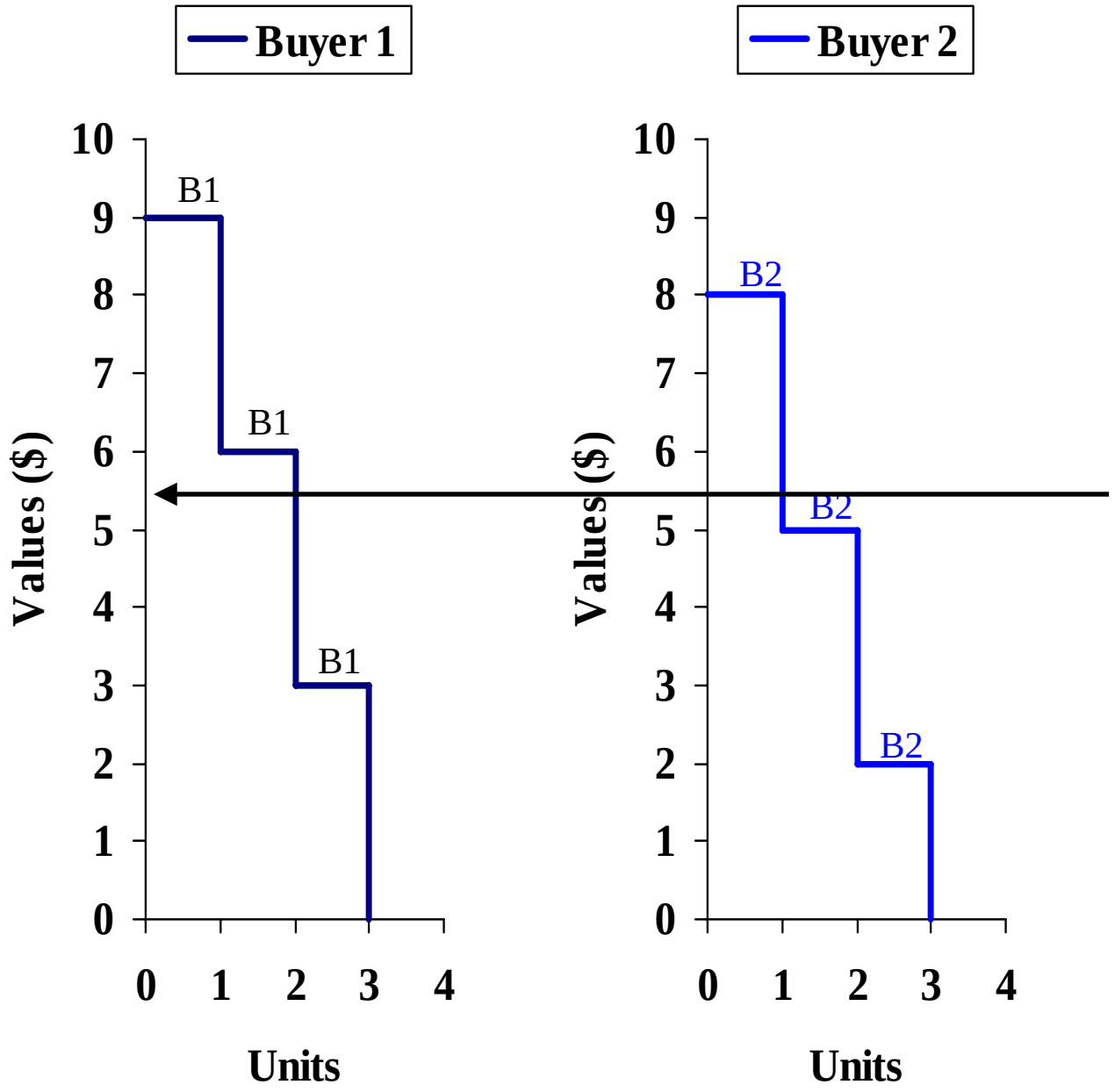
Buyer 2 has a similar demand schedule.

Unit	Value
1st	$8
2nd	$5
3rd	$2

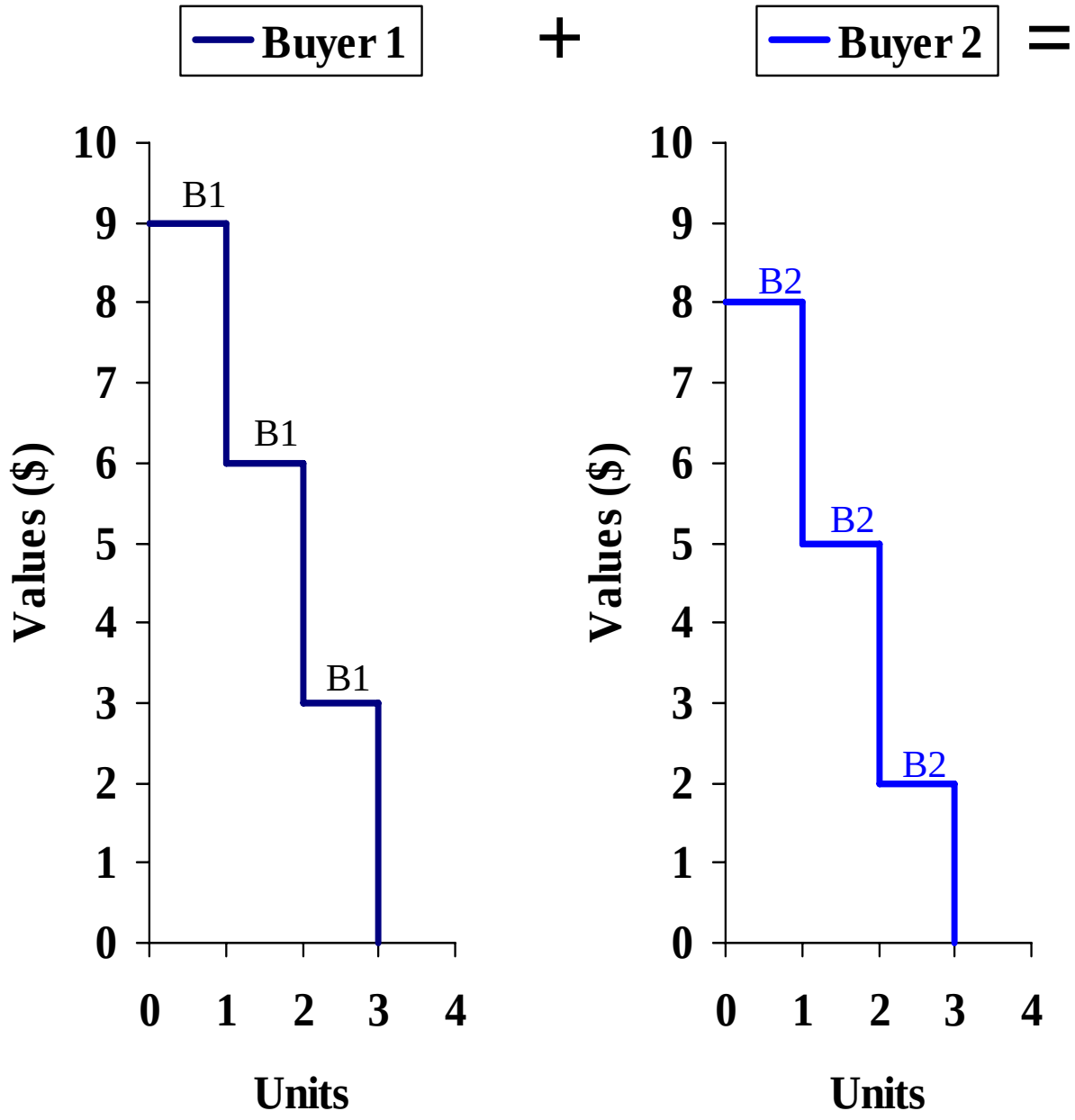




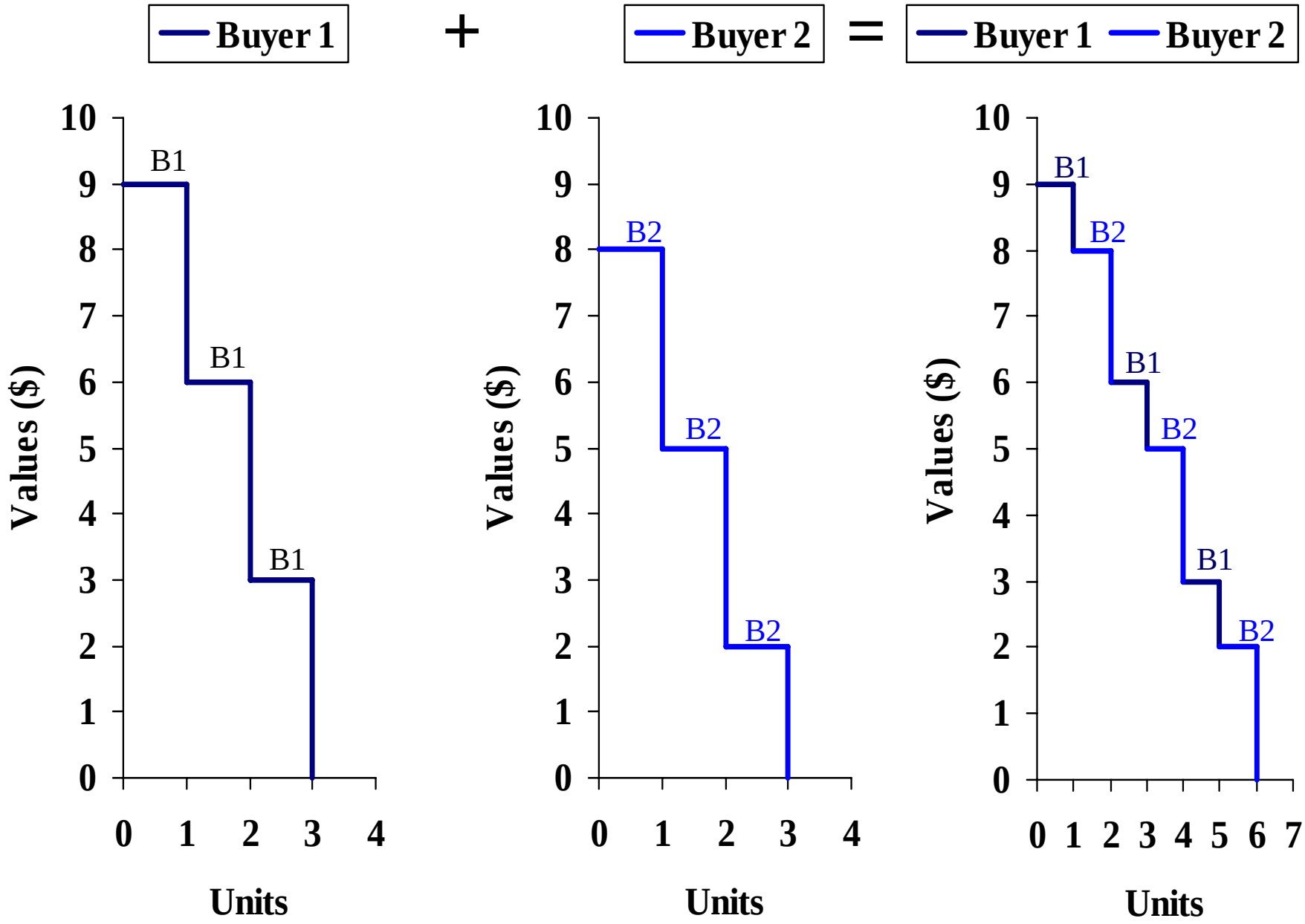
Now at a price of $5.50, how many units are the two buyers willing to purchase?



The buyers are willing to buy *three* units at a price of $5.50.



Is there some way we can show total willingness to buy more easily?


Buyer 1
+
Buyer 2
=
Buyer 1
Buyer 2
Values ($)
Units
B1
B1
B1
B2
B2
B2
B1
B2
B1
B2
B1
B2

Another way to see this is to sort the individual values to get a single value schedule.

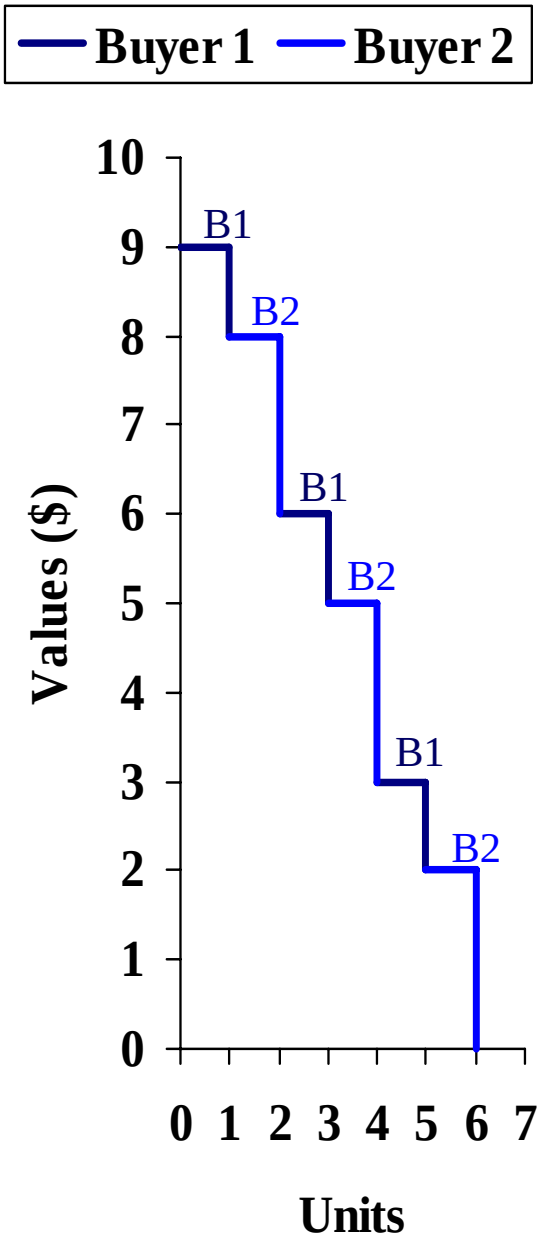
Buyer 1	
Unit	Value
1st	$9
2nd	$6
3rd	$3

+

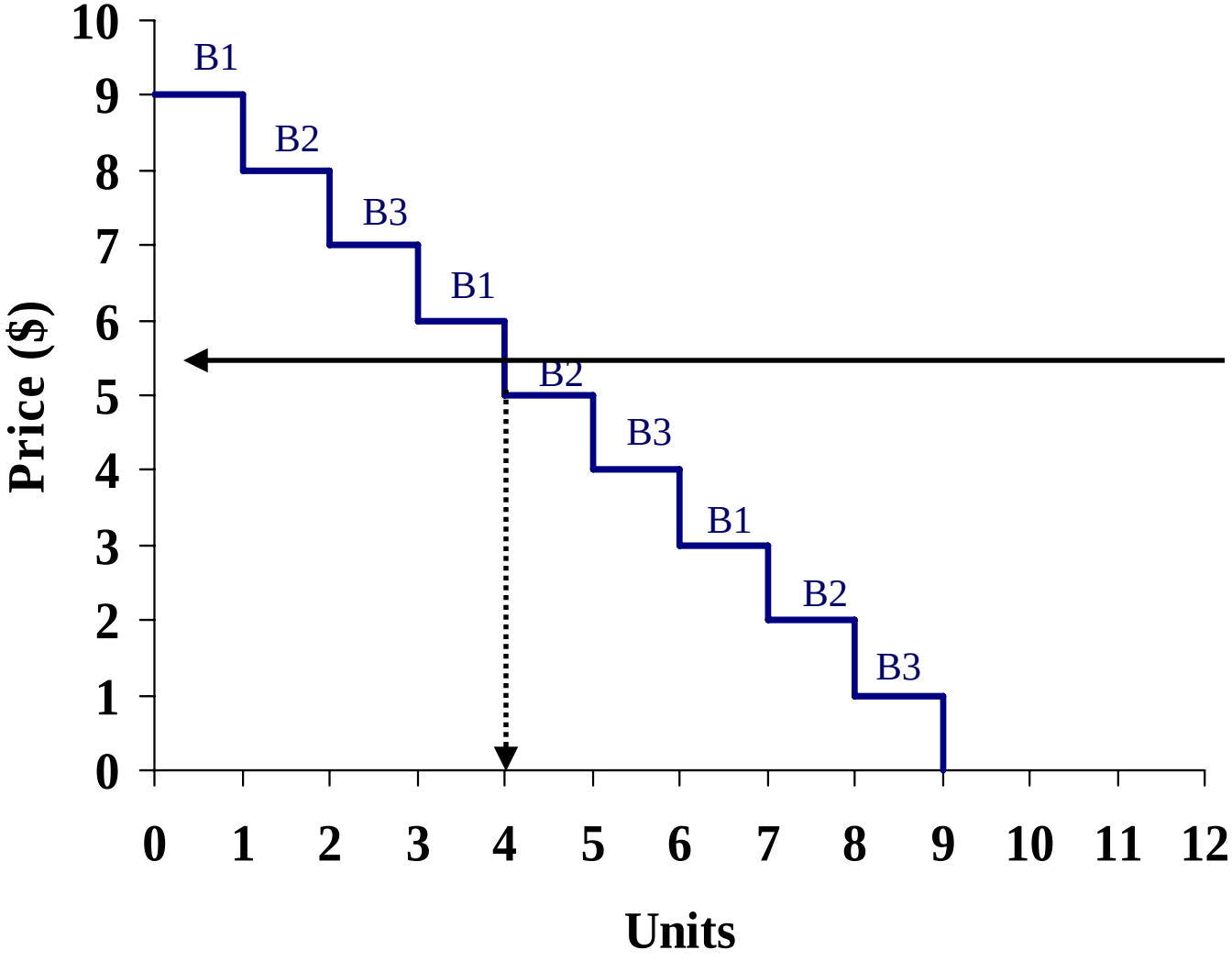
Buyer 2	
Unit	Value
1st	$8
2nd	$5
3rd	$2

=

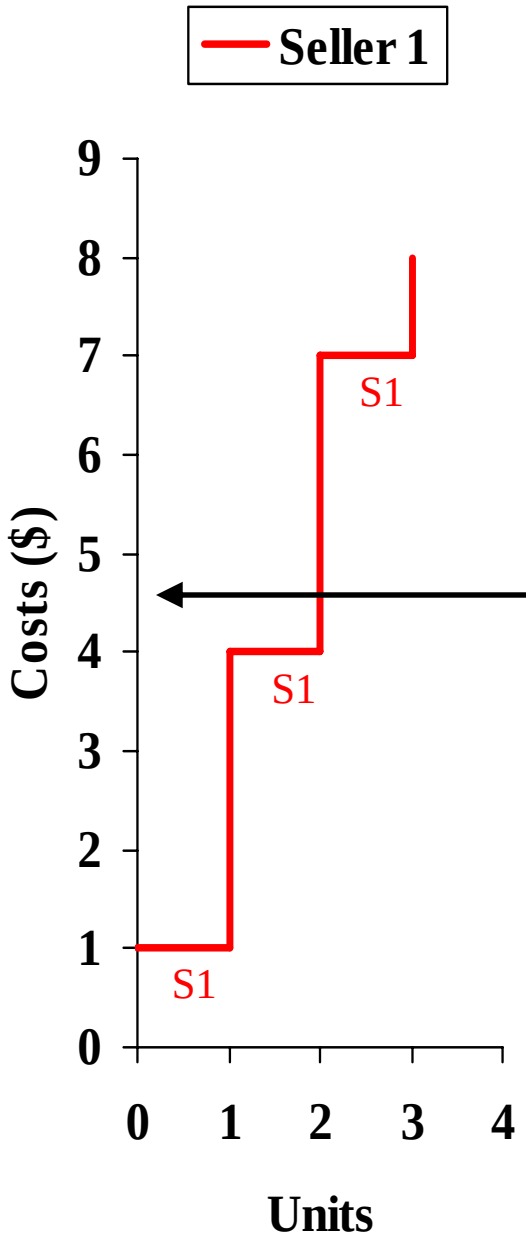
All Buyers	
Unit	Value
1st	$9
2nd	$8
3rd	$6
4th	$5
5th	$3
6th	$2



Demand: a schedule that indicates how much consumers are willing and able to purchase at alternative prices.



At a price of $5.50 buyers are willing to purchase up to *four* units.



Seller 1

Unit	Cost
1st	$1
2nd	$4
3rd	$7

Seller 1's Supply

Two

At a price of $4.50, how many units is seller 1 willing to supply?

Just like for buyers we can add up all of the individual seller's cost schedules.

Seller 1

Unit	Cost
1st	$1
2nd	$4
3rd	$7

+

Seller 2

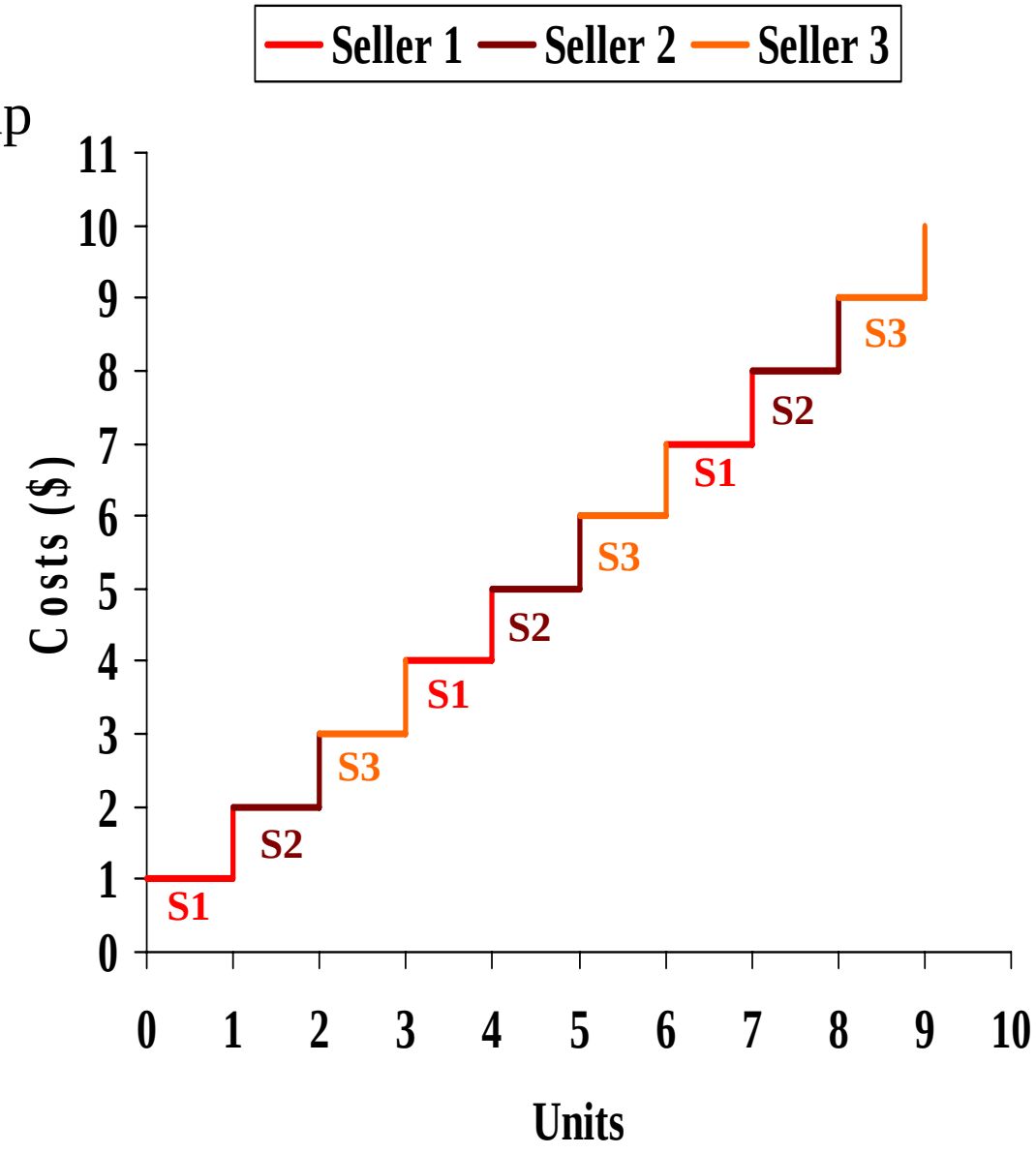
Unit	Cost
1st	$2
2nd	$5
3rd	$8

+

Seller 3

Unit	Cost
1st	$3
2nd	$6
3rd	$9

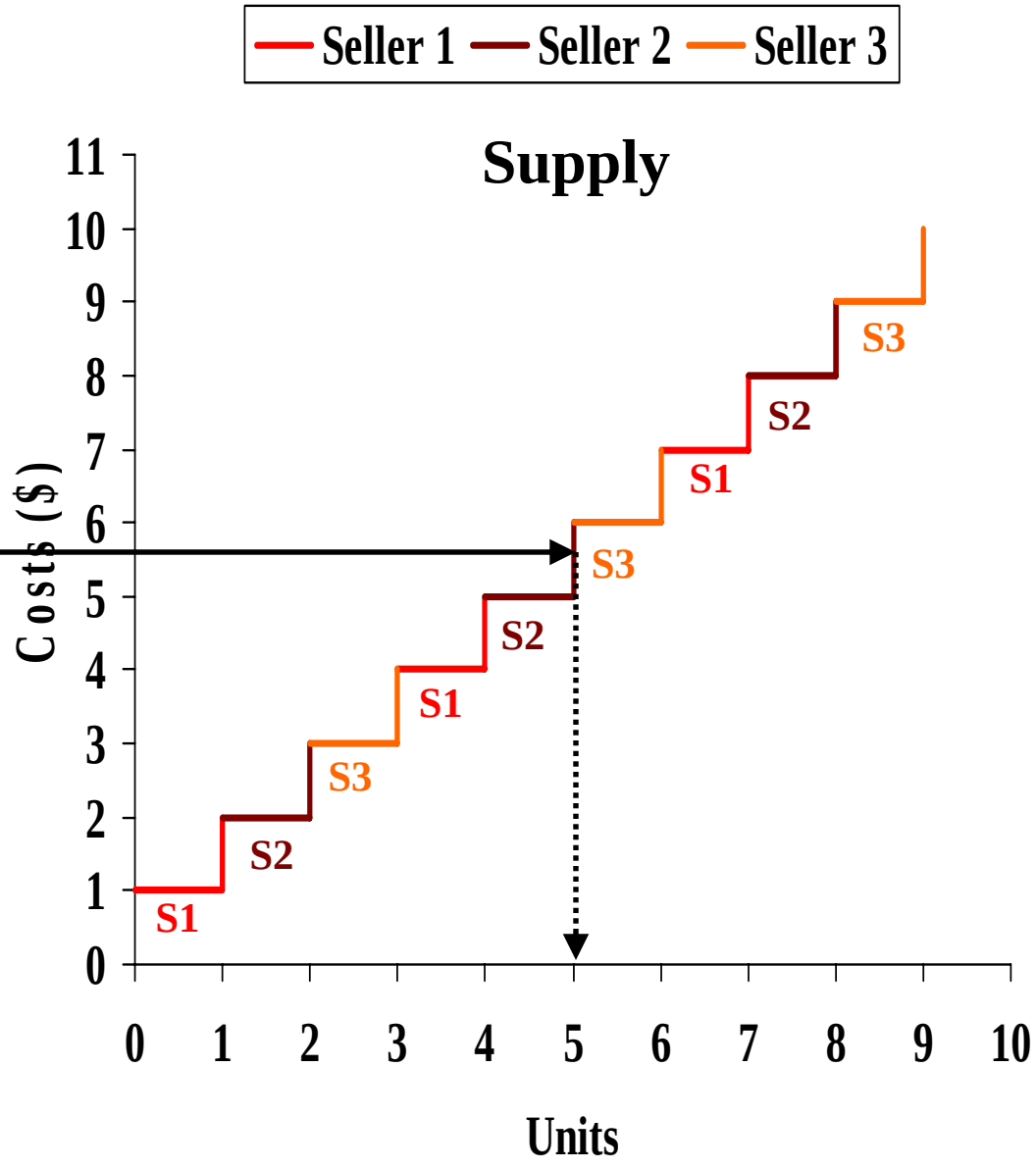
=



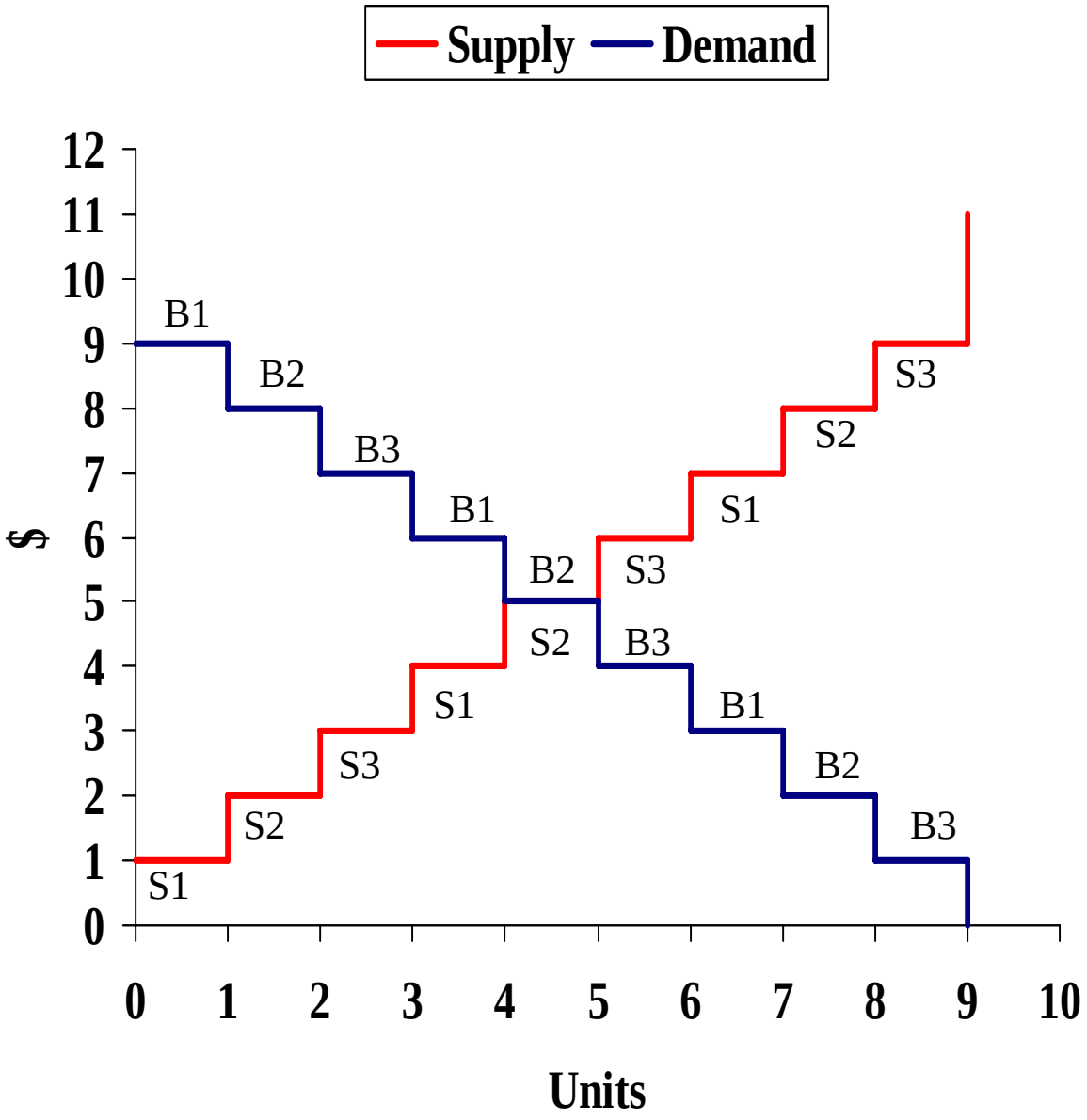
Supply: a schedule that indicates how much sellers are willing and able to supply at alternative prices.

Five

How many units are sellers willing to sell at $5.50?



We can now combine the supply and demand graphs together in one picture like this.

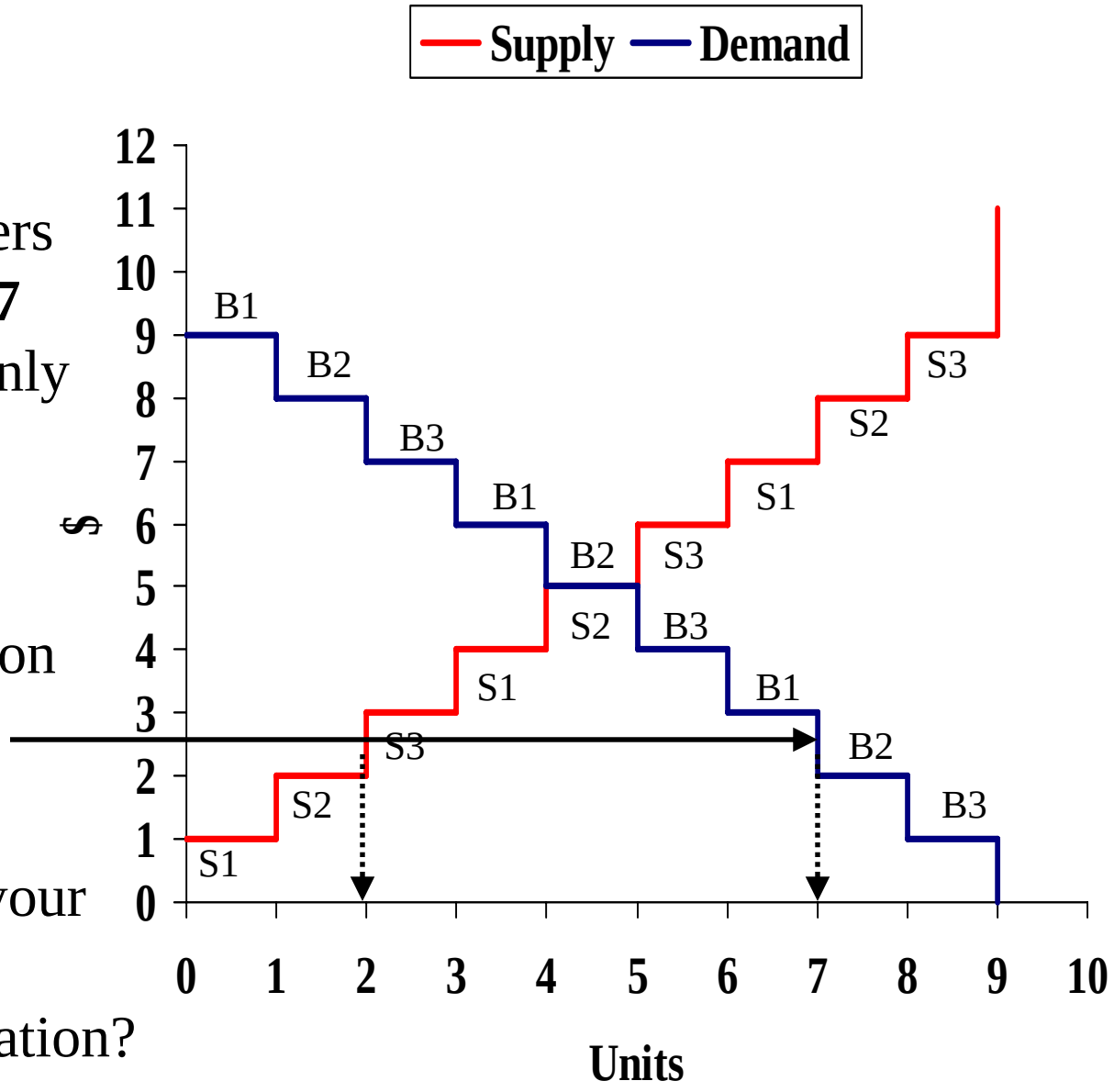


Excess Demand

At a price of $2.50 buyers are willing to purchase **7** units while sellers are only willing to sell **2** units.

We call this a condition of excess demand.

What did you do in your market when you experienced this situation?

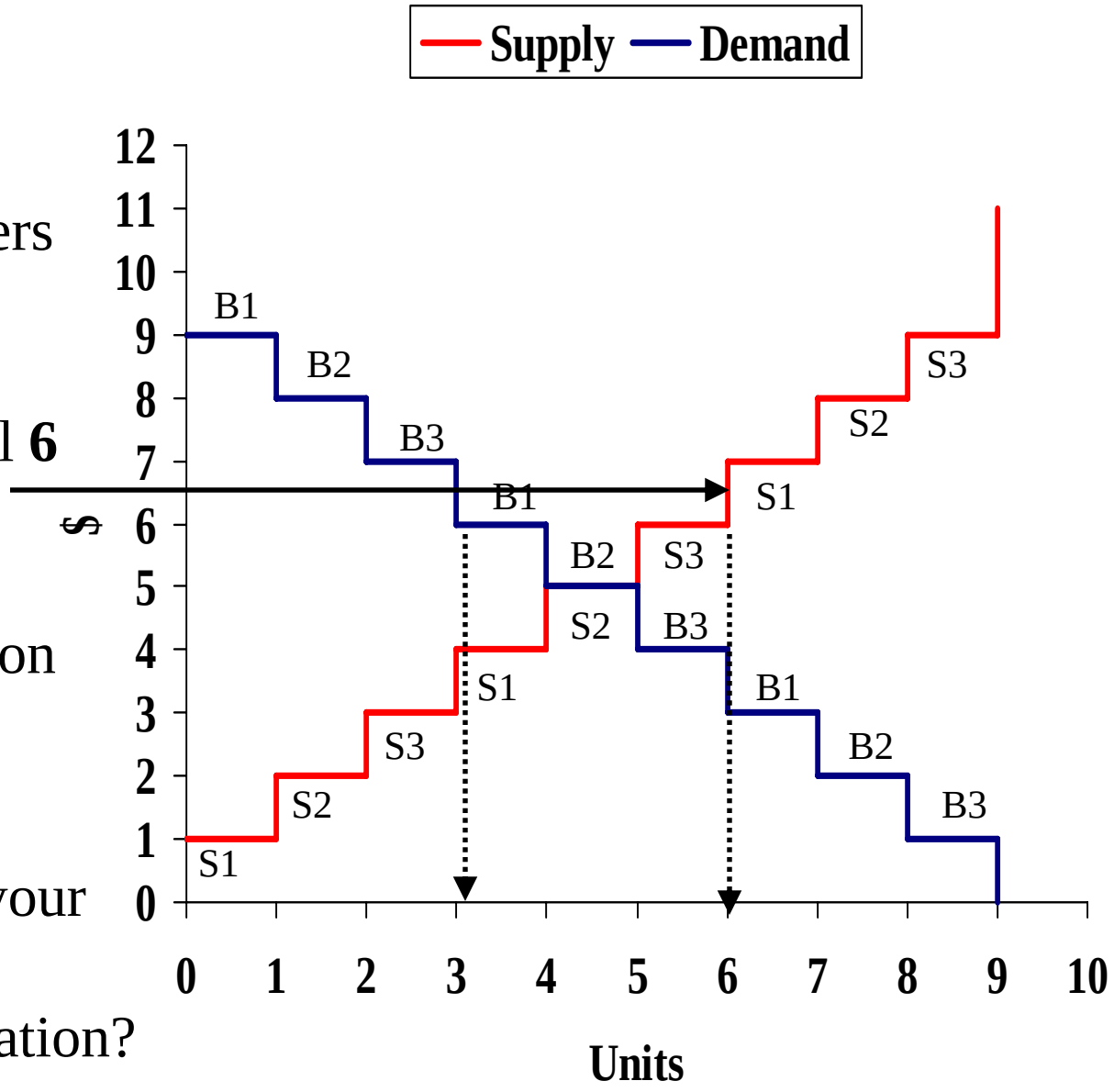


Excess Supply

At a price of $6.50 buyers are only willing to purchase **3** units while sellers are willing to sell **6** units.

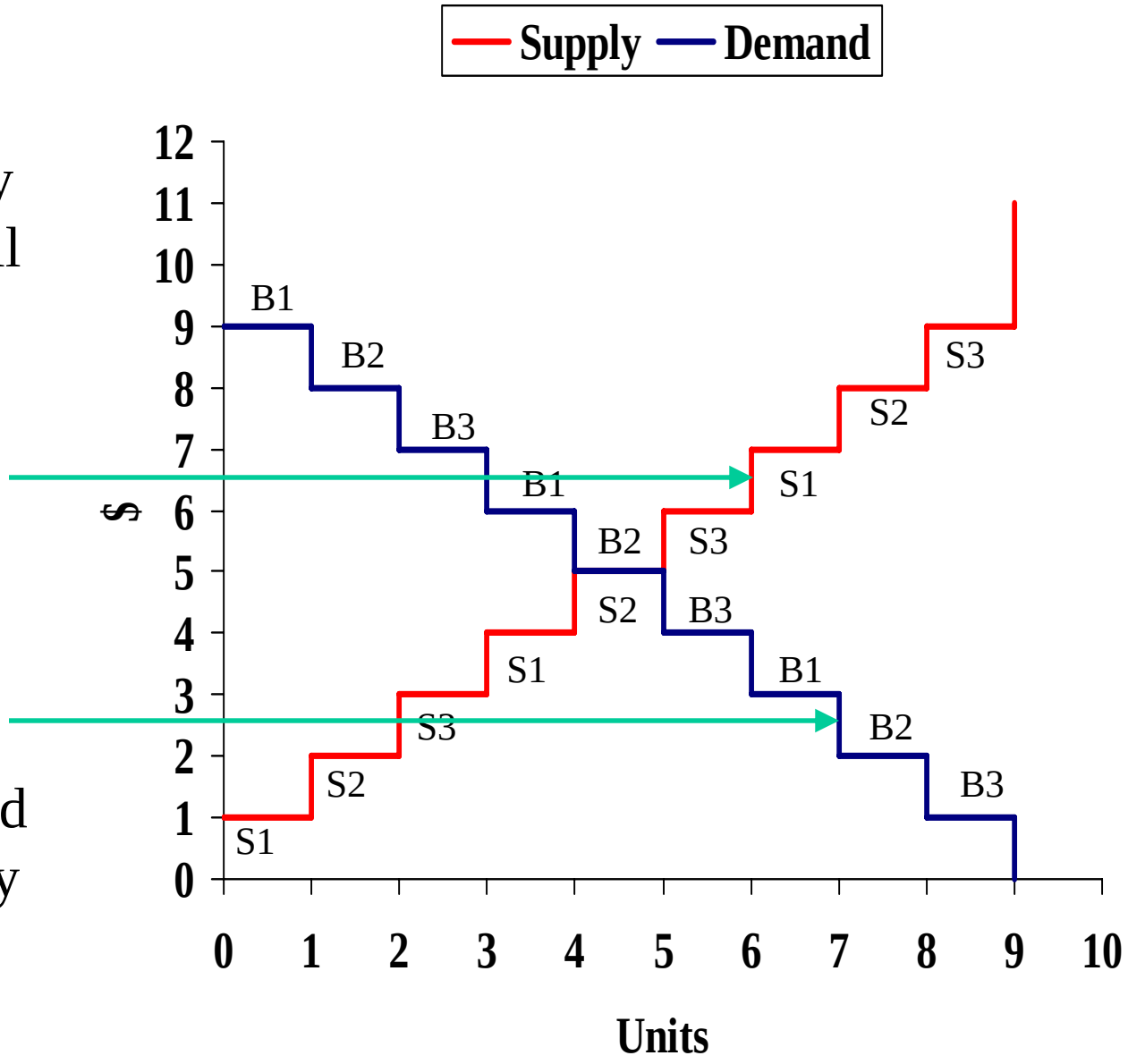
We call this a condition of excess supply.

What did you do in your market when you experienced this situation?

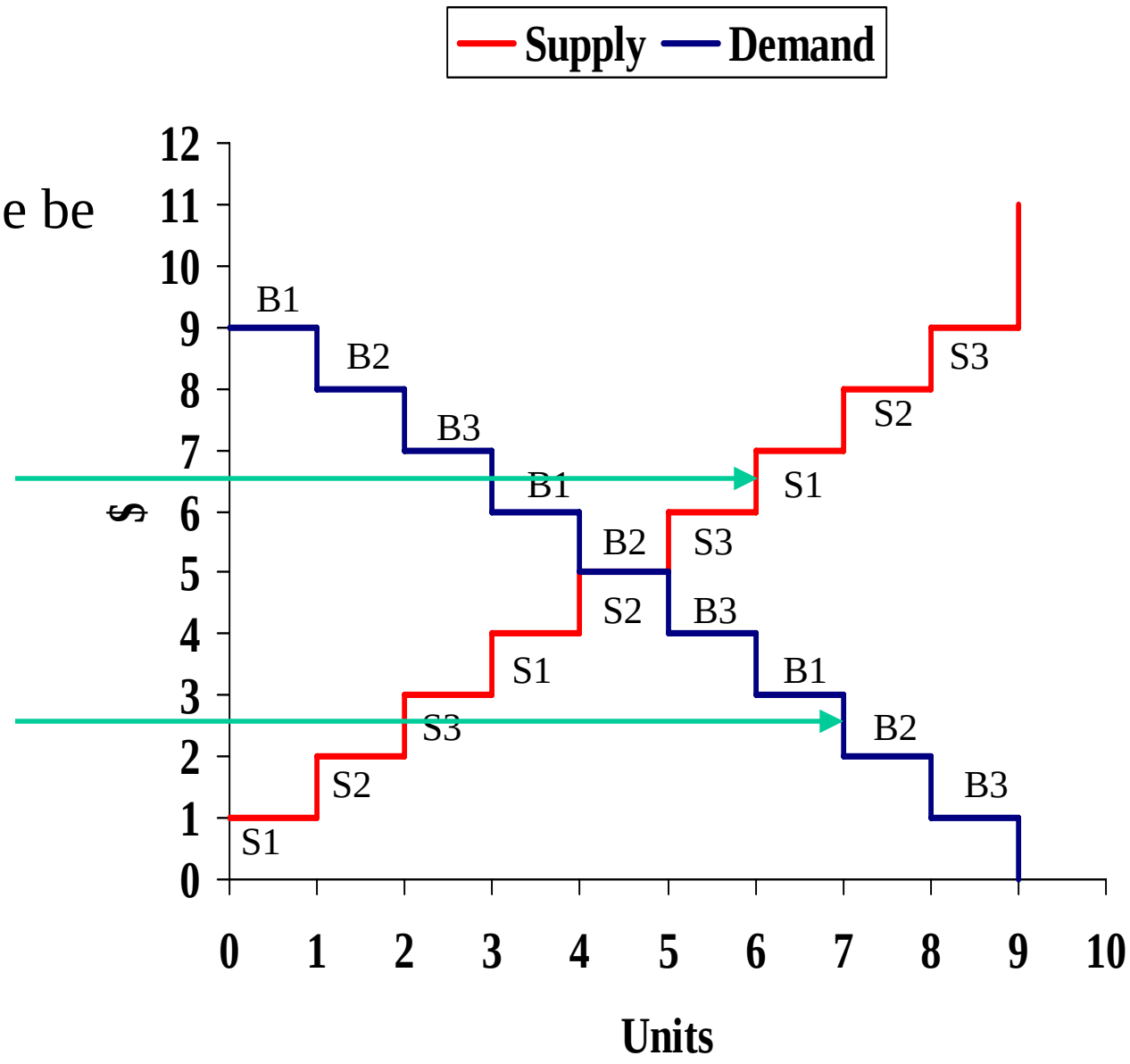


Under excess supply sellers who can't sell will tend to ask for a lower price.

Under excess demand buyers who can't buy will tend to bid the price up.



When will the price be in equilibrium?



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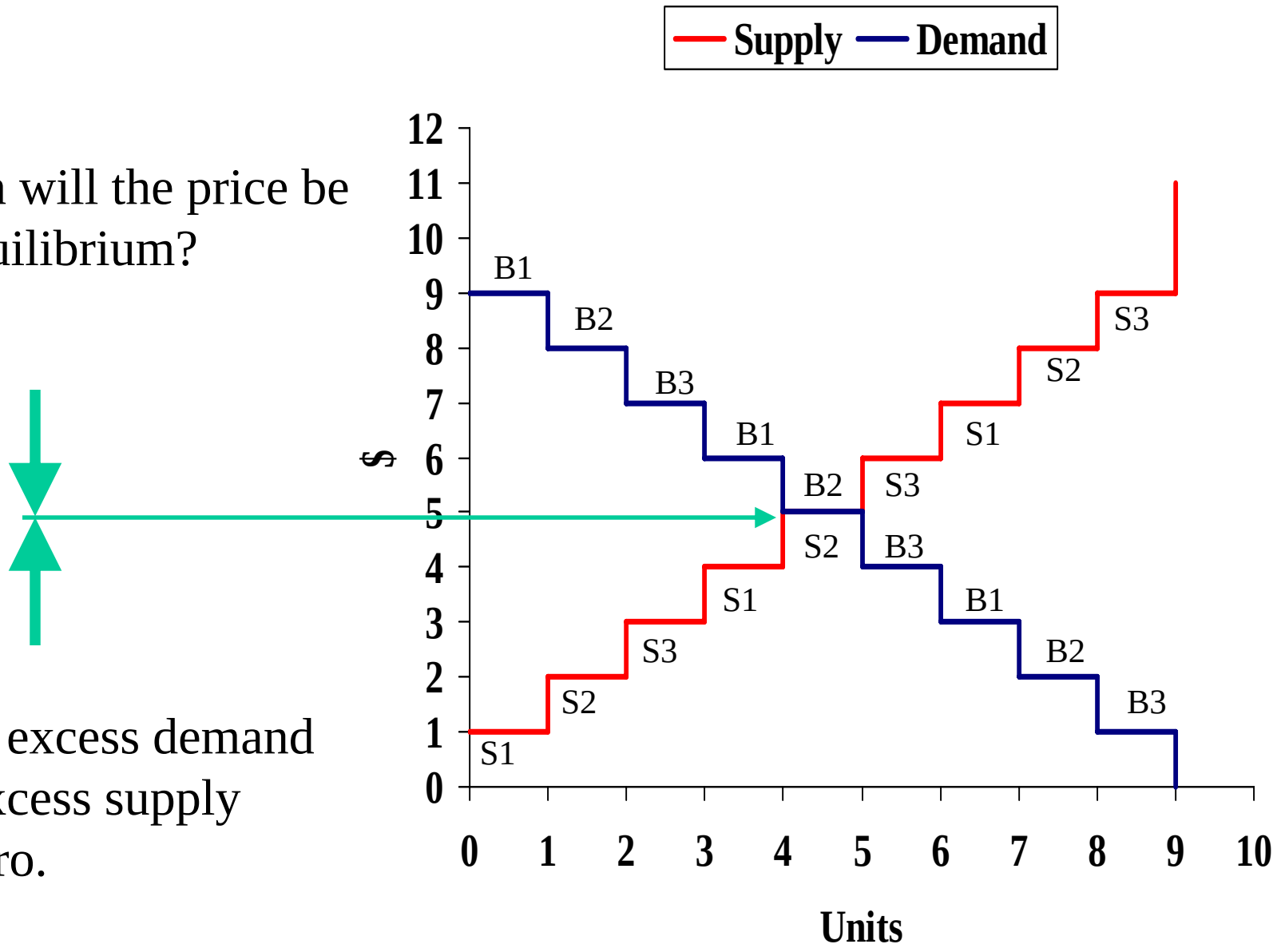
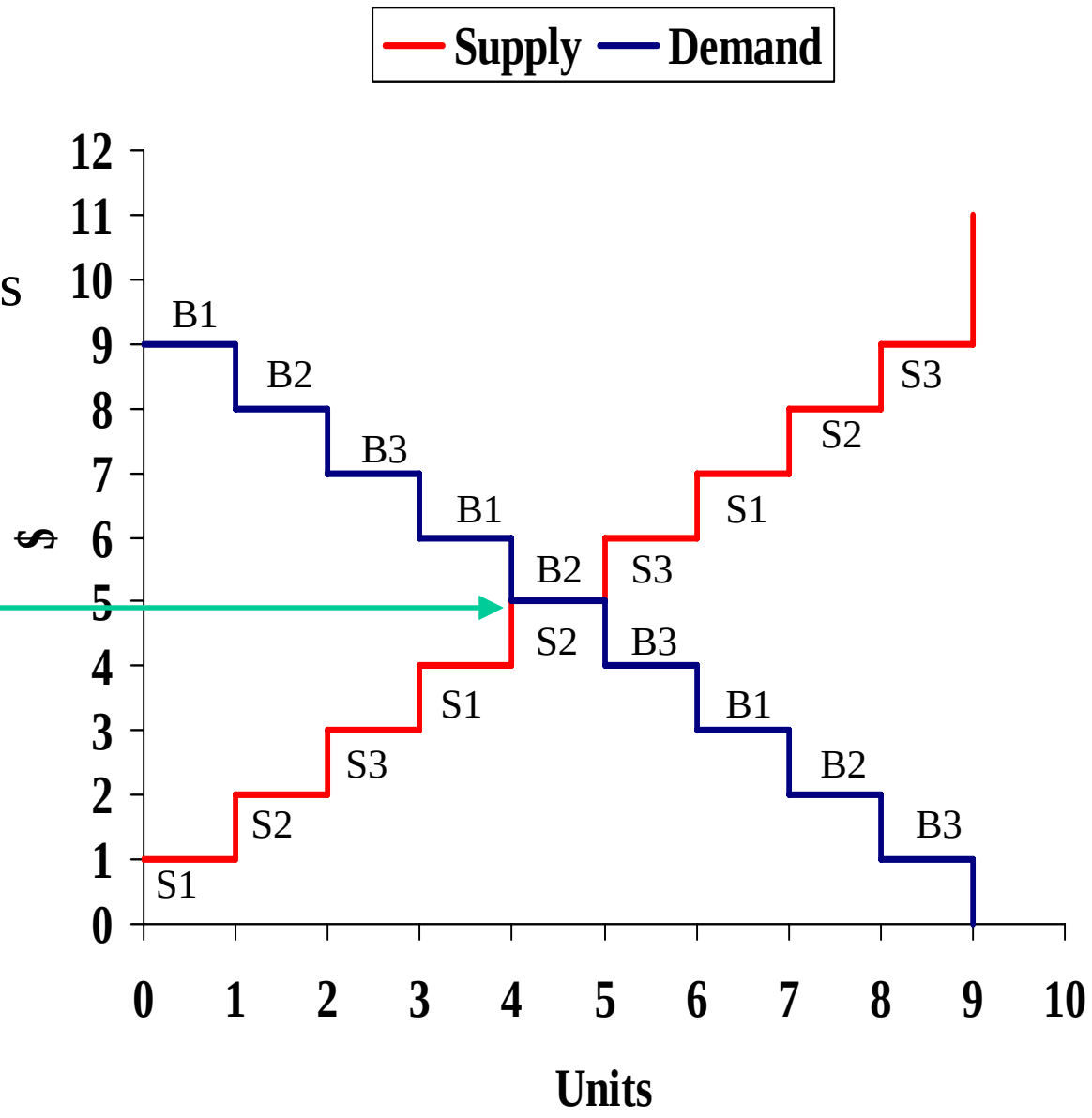


When excess demand and excess supply are zero.

We call this a *competitive equilibrium*, or, the price at which the quantity demanded equals the quantity supplied.

P = $5

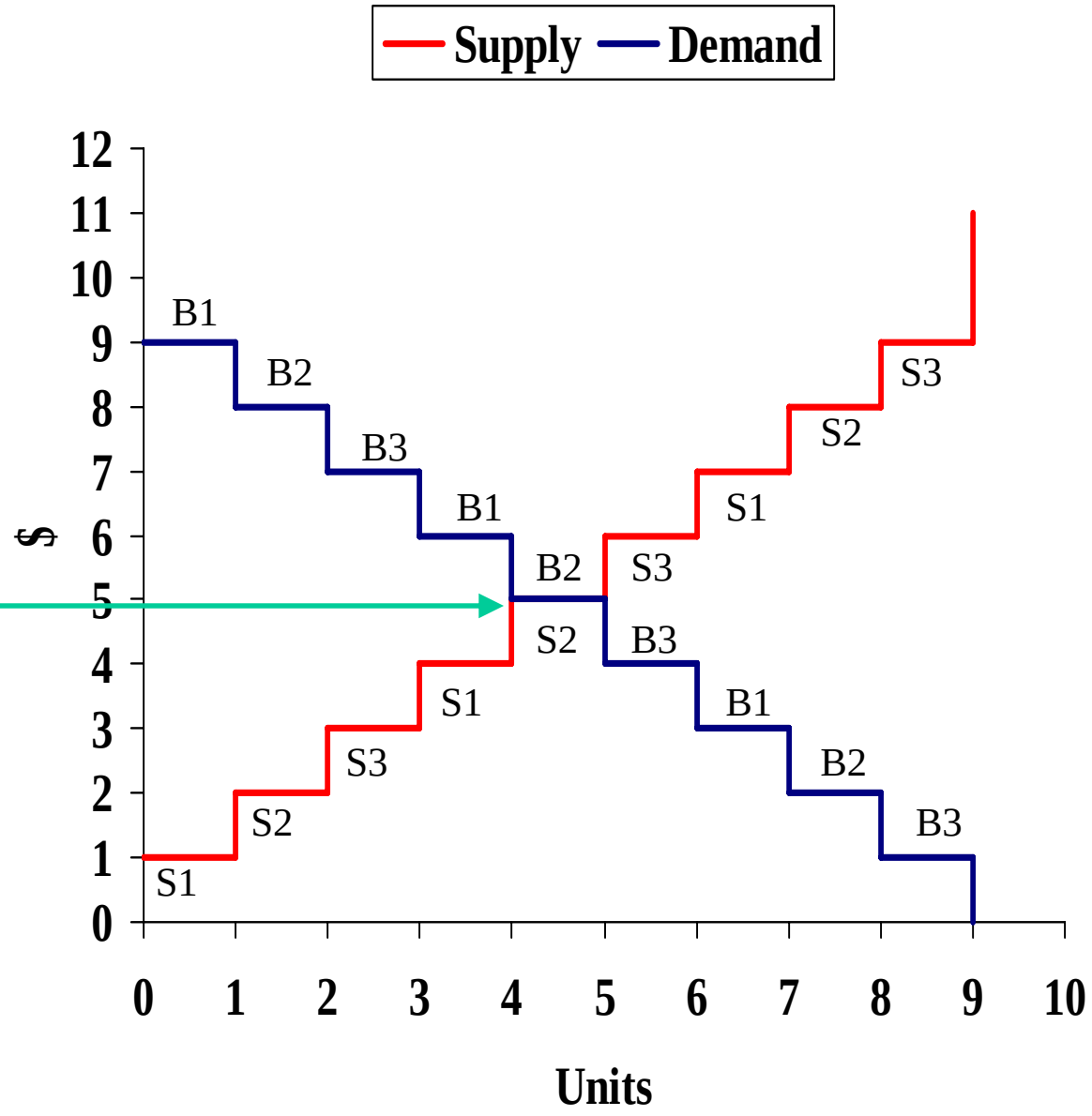
Buyers want to buy 5 units and sellers want to sell 5 units.



Competitive equilibrium is a theory in economics since it predicts how prices behave.

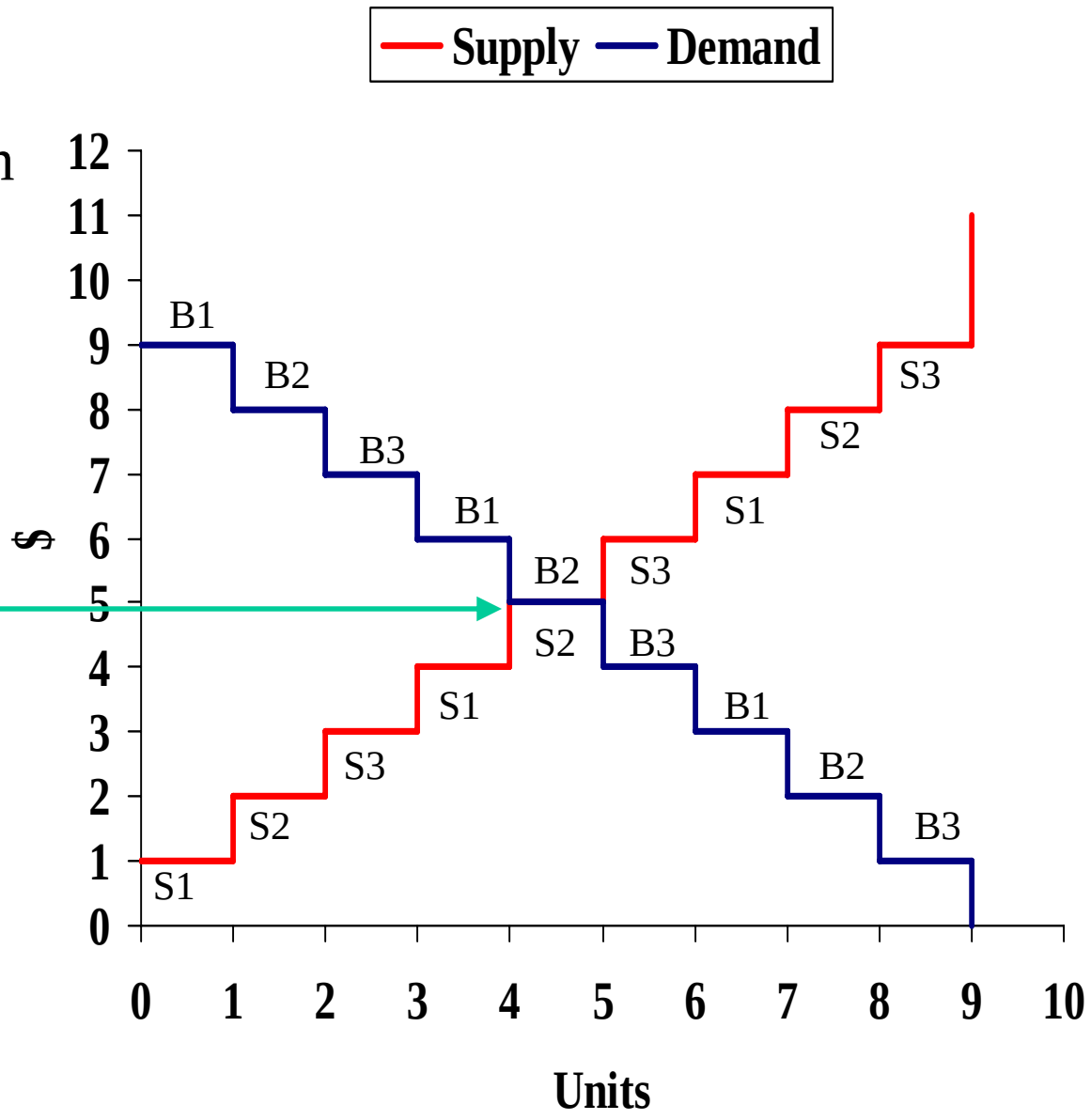
P = $5

It also predicts how prices will change with changes in supply and demand.



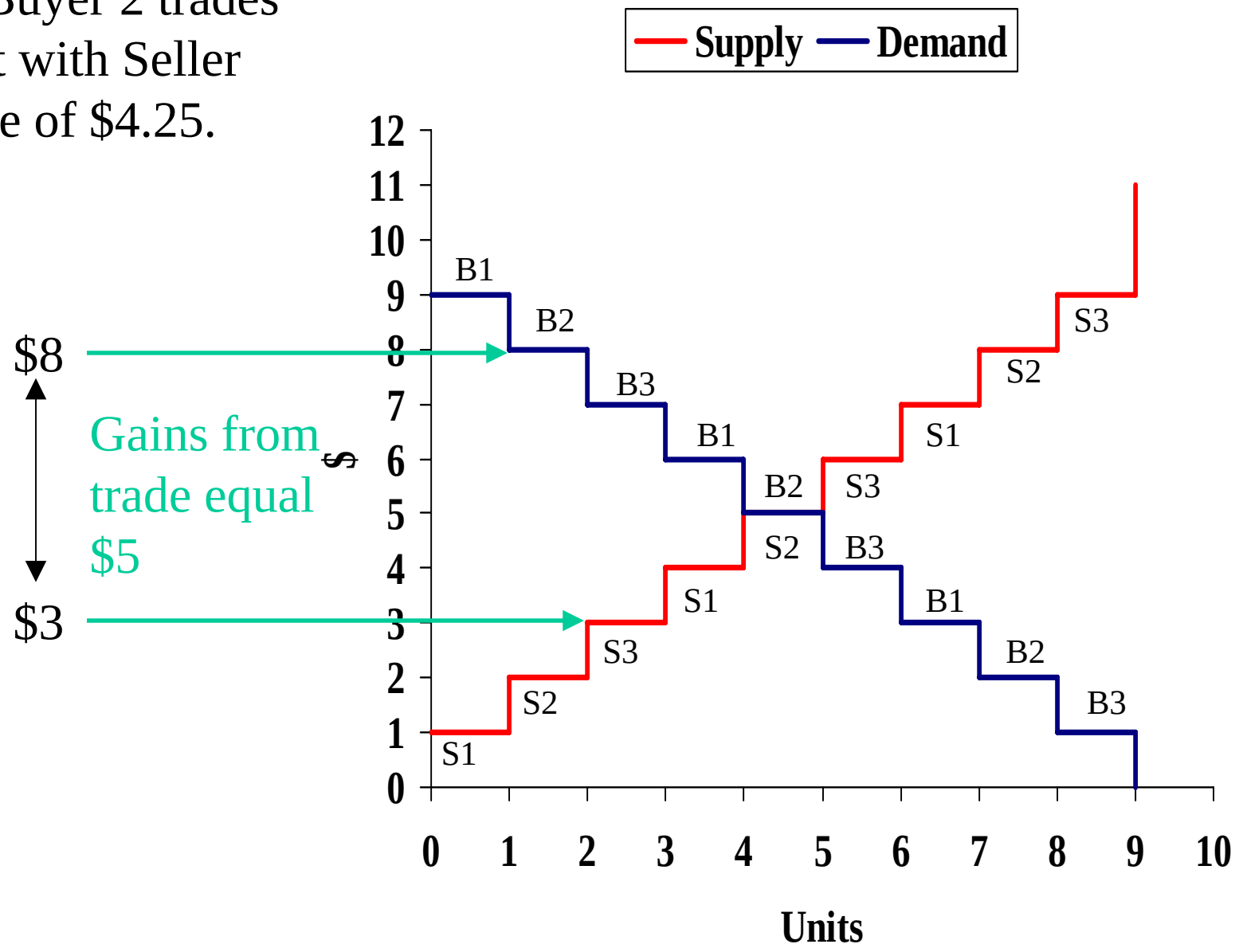
A competitive equilibrium also predicts that the resulting trades will be efficient.

P = $5



But what is meant by *efficient* or *efficiency*?

Suppose Buyer 2 trades a first unit with Seller 3 at a price of $4.25.

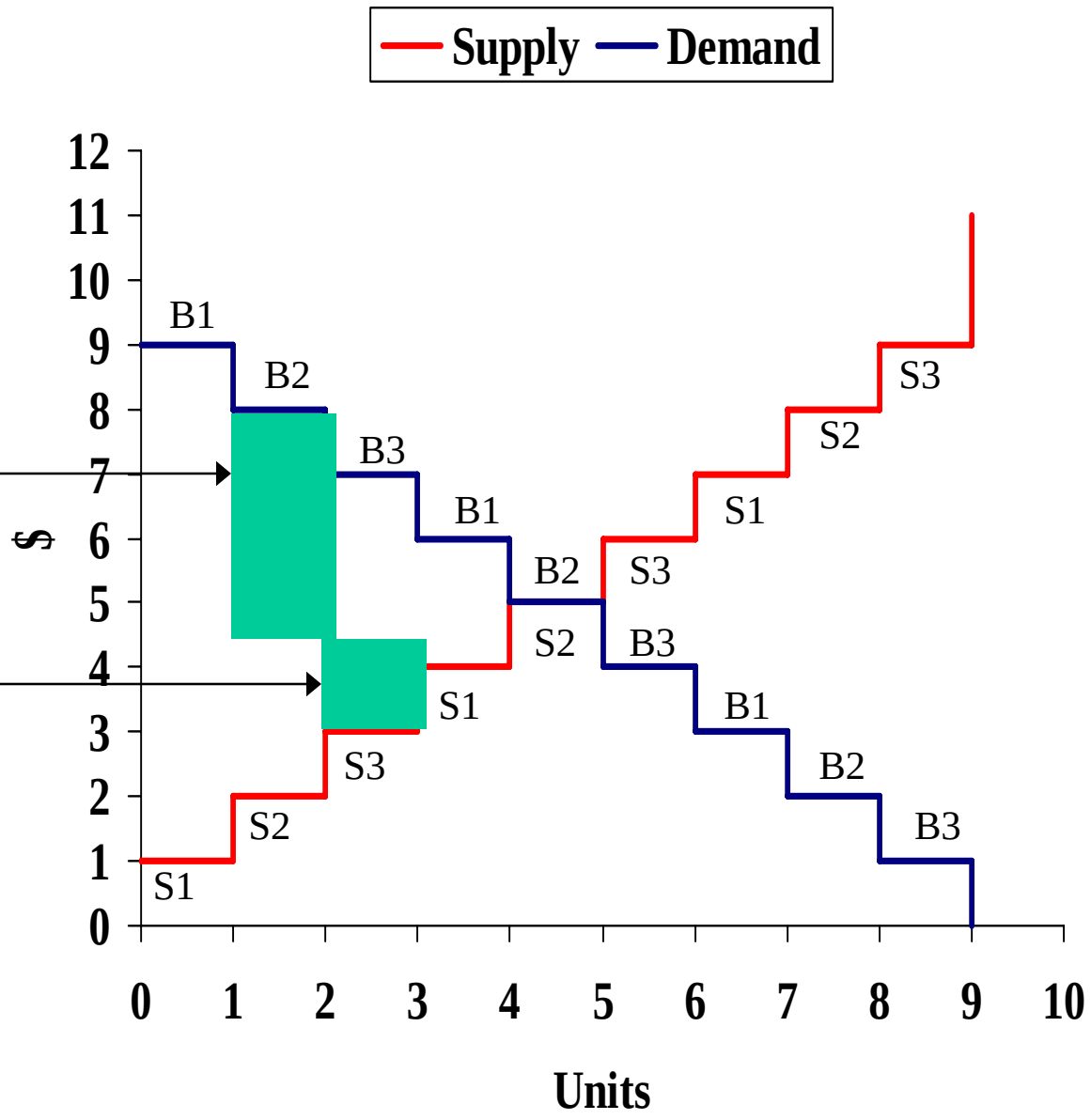


Suppose Buyer 2 trades a first unit with Seller 3 at a price of $4.25.

Buyer 2's profit or *consumer surplus* is $8 – 4.25 = $3.75.

Seller 3's profit or *producer surplus* is $4.25 – 3.00 = $1.25.

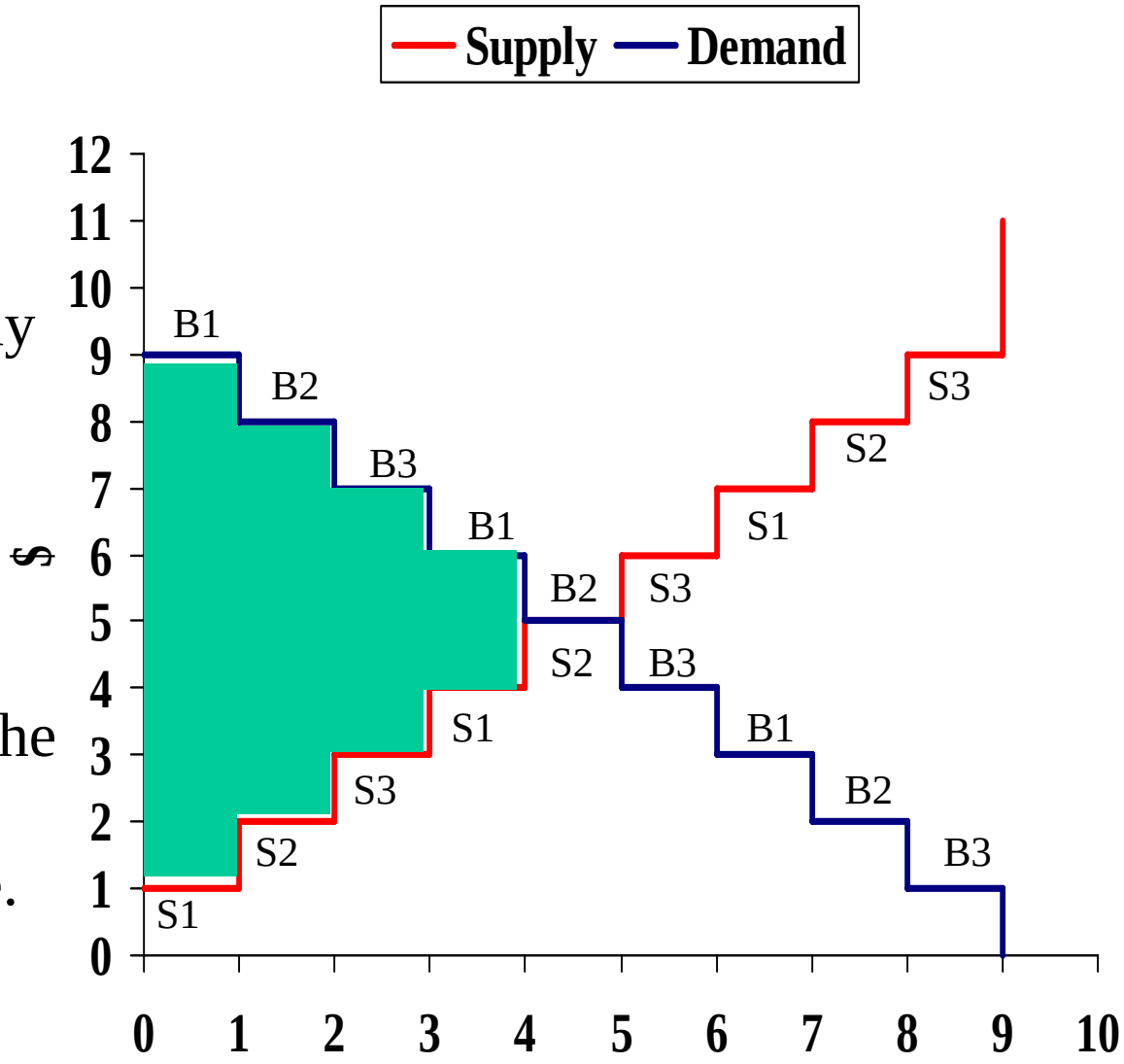
Surplus is a measure of the gains from trade.



Both buyers and sellers gain from a trade.

Consumer Surplus is the difference between what customers are willing to pay and what they actually pay.

Producer Surplus is the difference between what the sellers receive and what they are willing to receive.

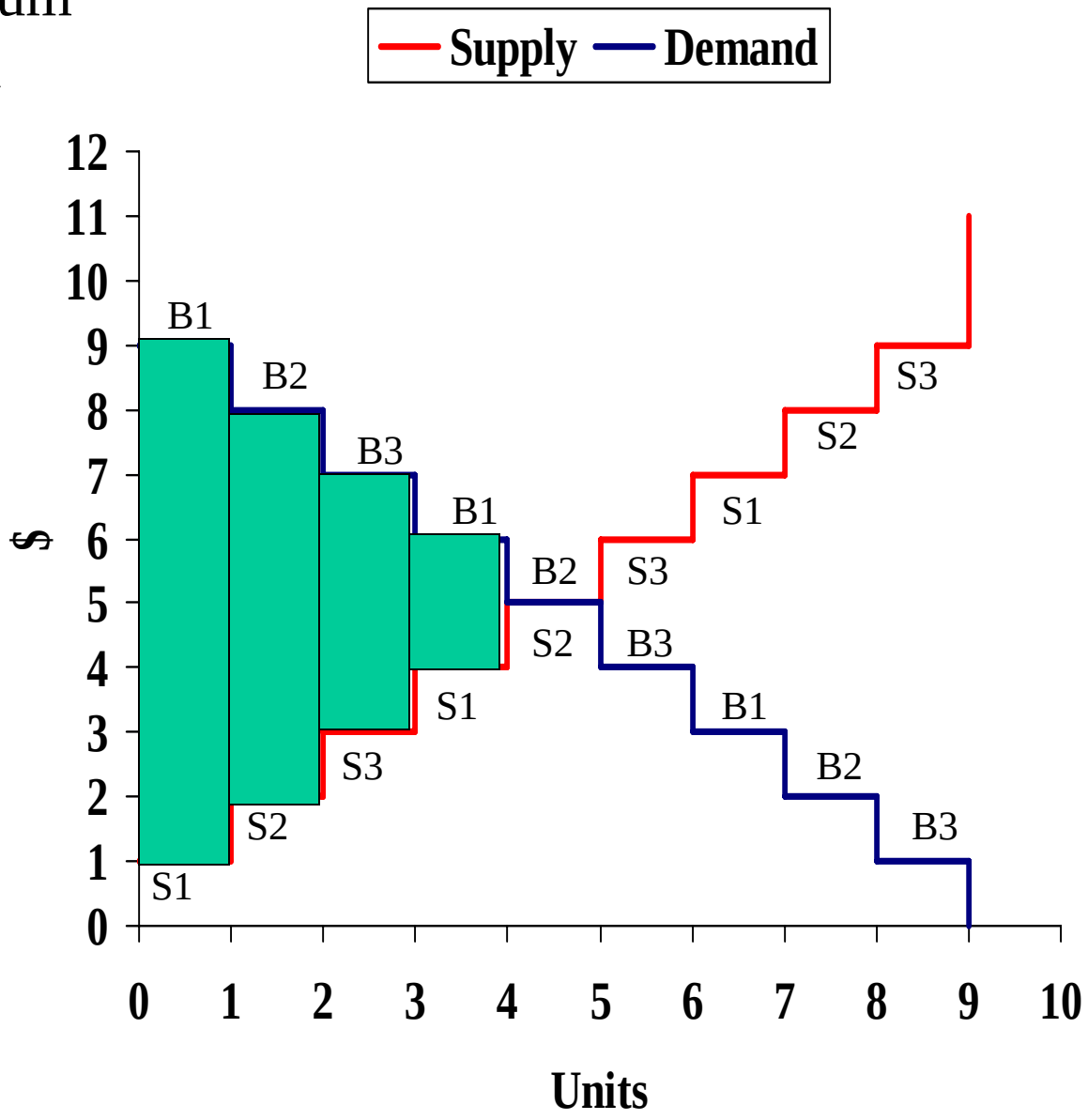


Total Surplus = Producer + Consumer surplus.

At the competitive equilibrium price of $5, B1 and B2, will each buy two units, and B3 will buy one unit.

Also, S1 and S2 will each sell 2 units, and S3 will sell one unit.

Total gains from trade (or *surplus*) are given by the green shaded area.

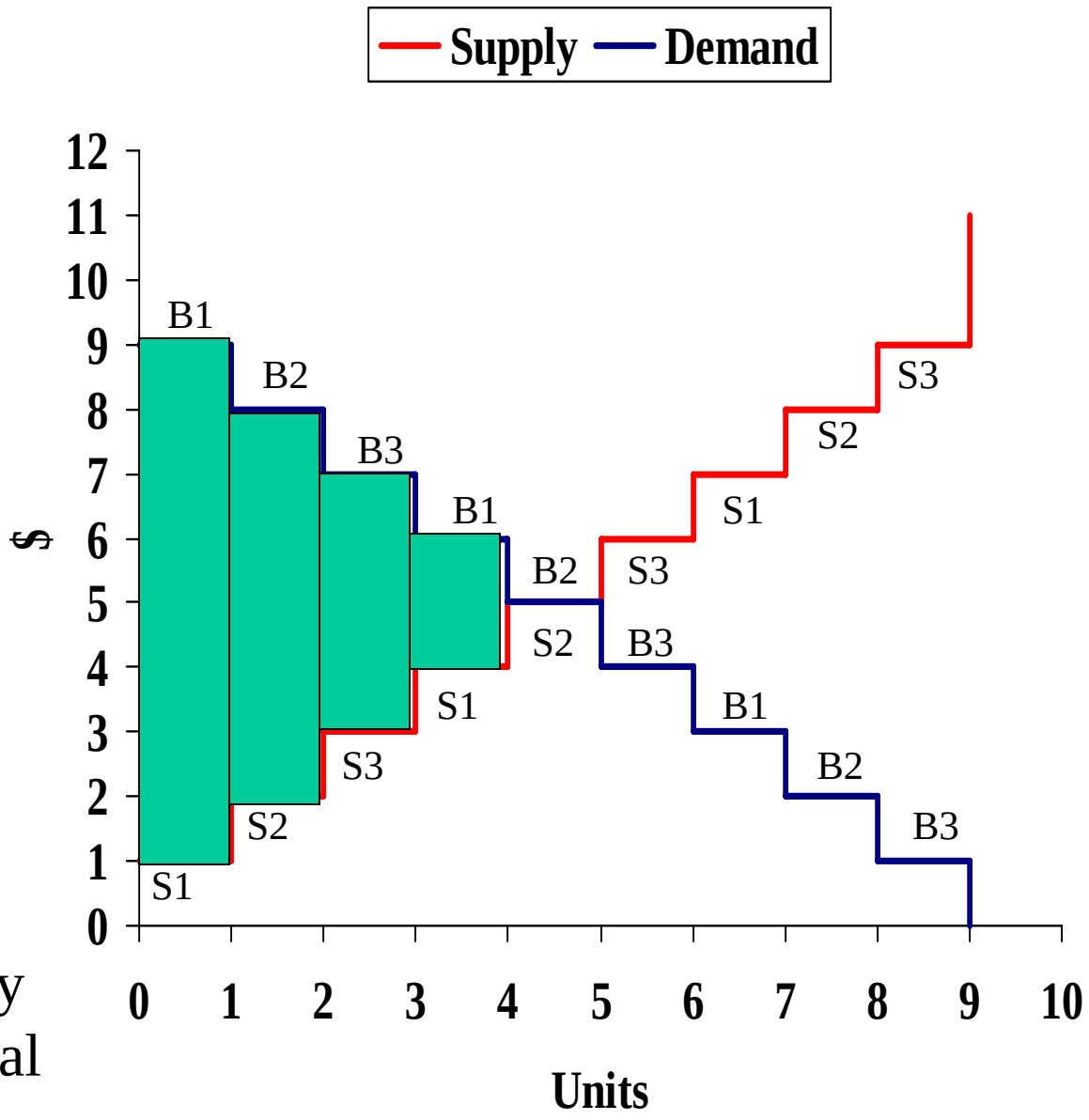


Adding up the green squares we find that total surplus (producer + consumer) is $20.

The total surplus calculated from the competitive equilibrium is also the maximum possible surplus that can be generated from trade. Can you see why?

For any given set of trades we can calculate the actual surplus generated by those trades.

Market *efficiency* is total surplus realized divided by the maximum possible total surplus.



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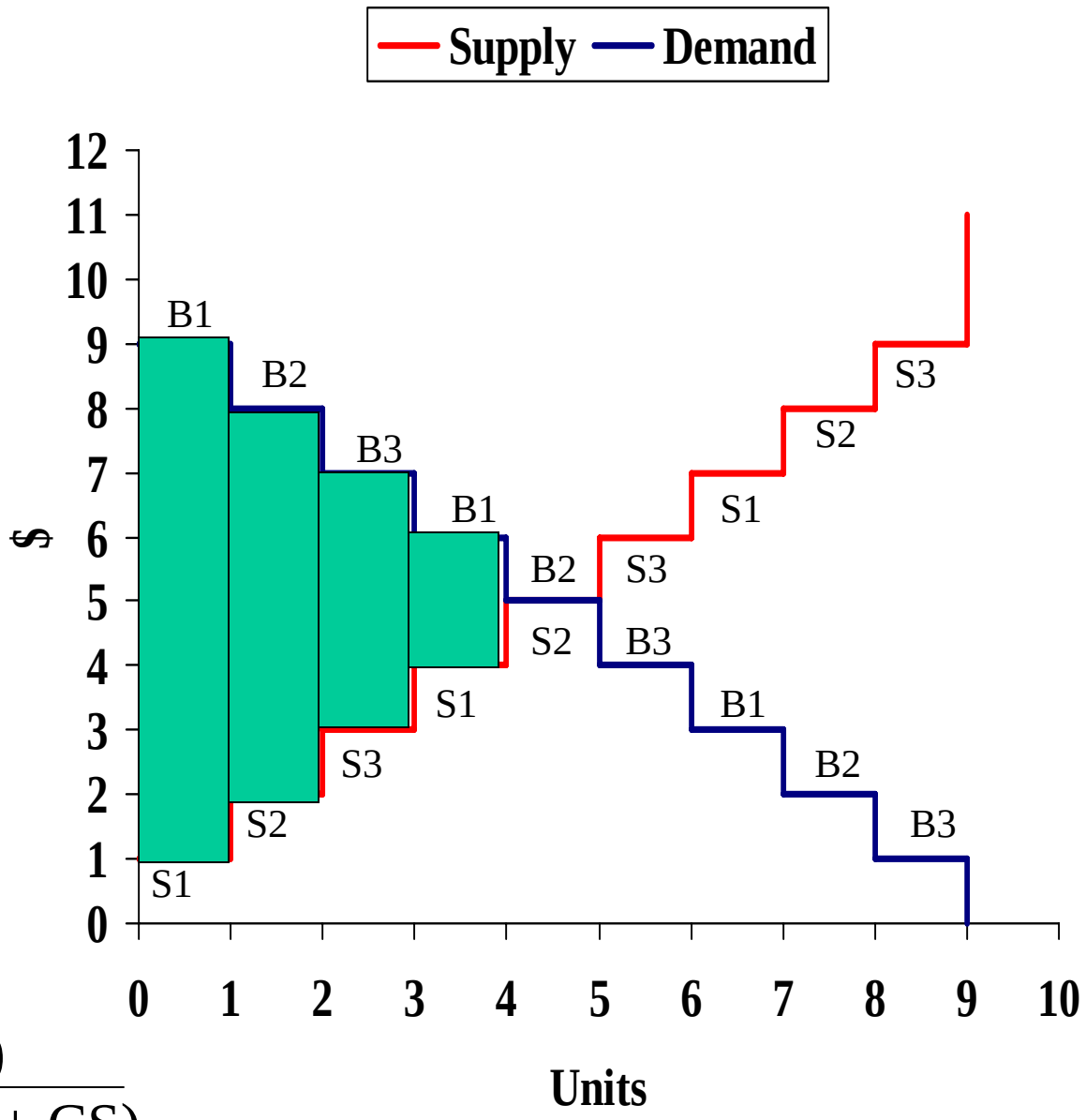


Efficiency (%) =

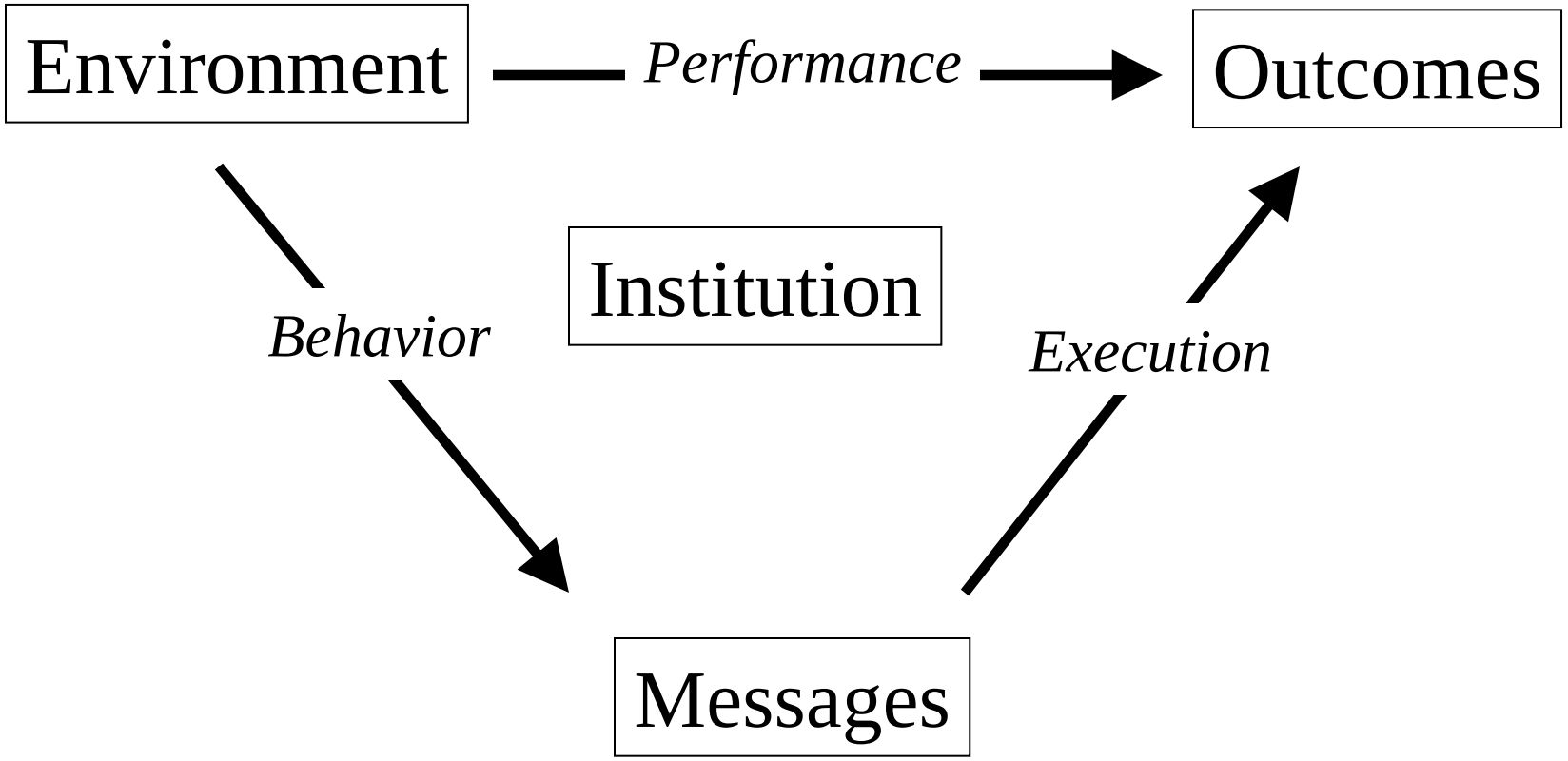
$$\frac{\text{Realized (PS + CS)}}{\text{Maximum Possible (PS + CS)}}$$

OK…So What Happened in Our Market?

The Oral Double Auction

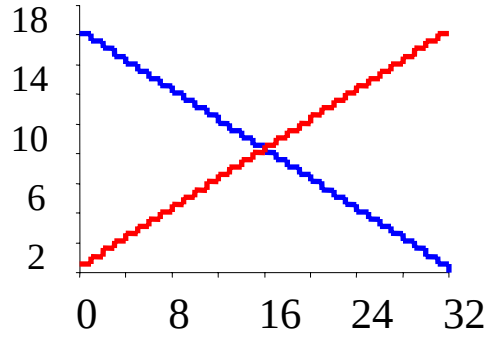
- Individuals choose purposefully.
  - Interacting non-cooperatively and impersonally, a market of individuals simultaneously maximizes:
    (1) An individual's return *intentionally* and
    (2) The aggregate social gains from exchange *unintentionally*.
- "The most significant fact about this (price) system is the economy of knowledge with which it operates, or how little the individual participants need to know in order to be able to take the right action" (Hayek, 1945).

What is an Economic System?



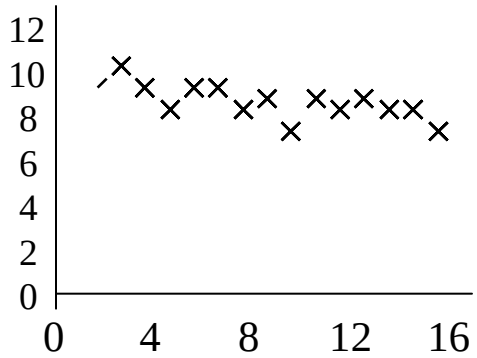
What is an Economic System?

Environment



Performance
(efficiency)

Outcomes



Institution
DA Clearing House

Behavior

Execution

Messages

ID	BID	ASK	ID
B1	7	8.5	S5
		8.25	S1
B3	7.75	8	S5

B1 Accepts S5's offer