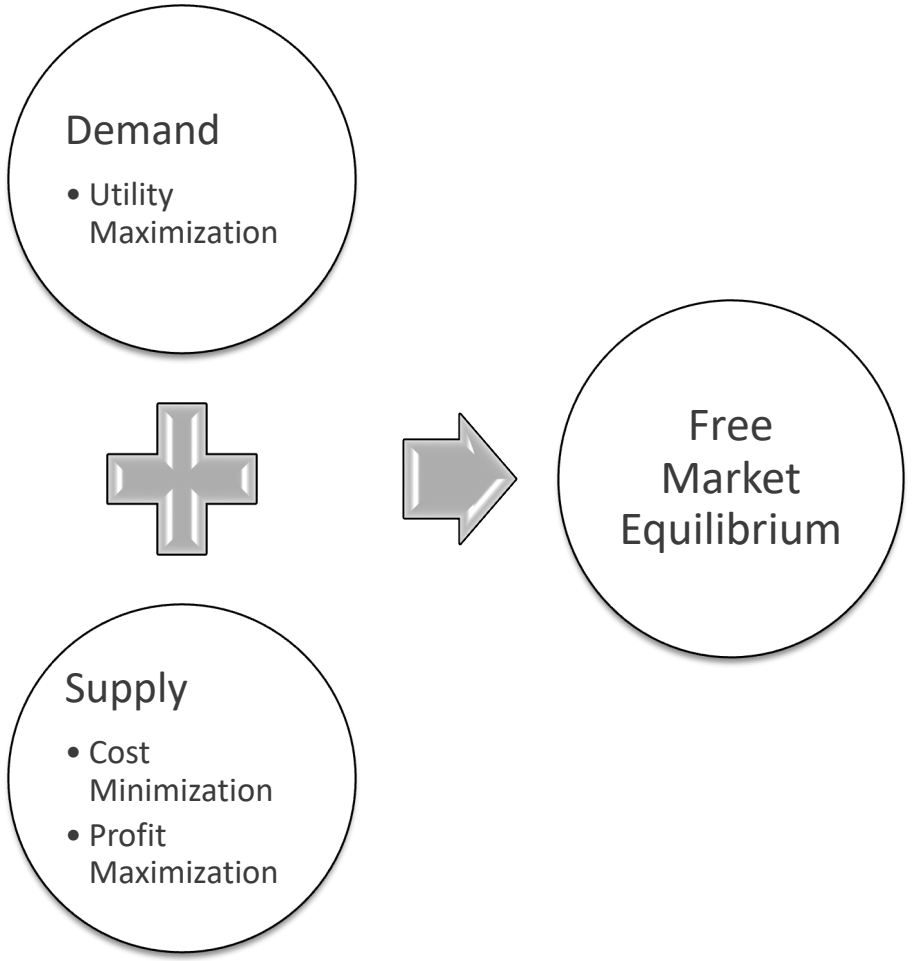
LECTURE 12
GOVERNMENT INTERVENTIONS
FINAL REVIEW

Where are we?


Demand
• Utility Maximization
Supply
• Cost Minimization
• Profit Maximization
Free Market Equilibrium

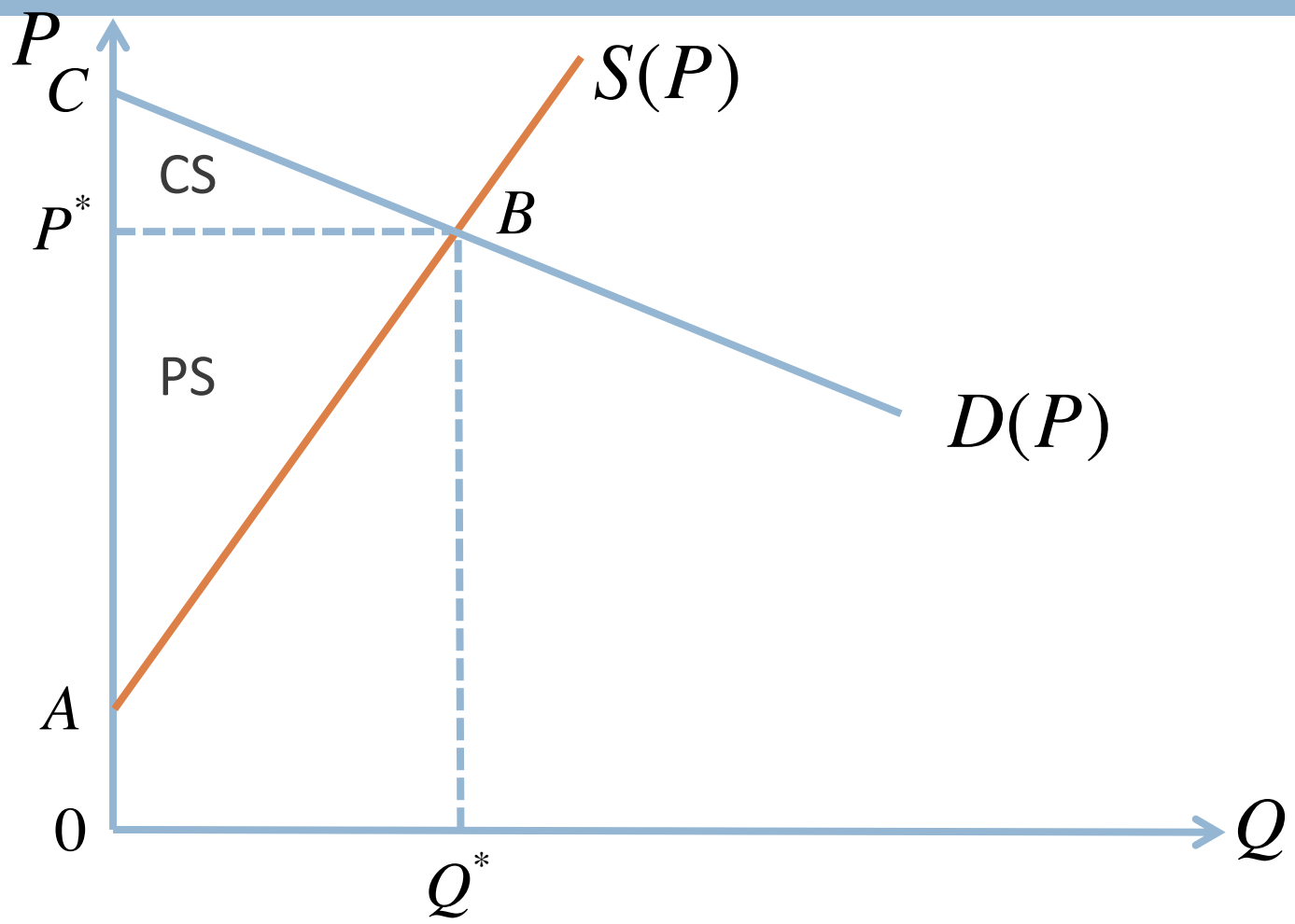
Part 1

Welfare and Efficiency

How to measure welfare?

- Total surplus consumers receive
  - Measured by consumer surplus
- Total surplus producers receive
  - Measured by producer surplus
- Total surplus for the market as a whole
  - Total surplus = consumer surplus + producer surplus
- If there is government intervention
  - Total surplus = consumer surplus + producer surplus + government revenue/expenditure

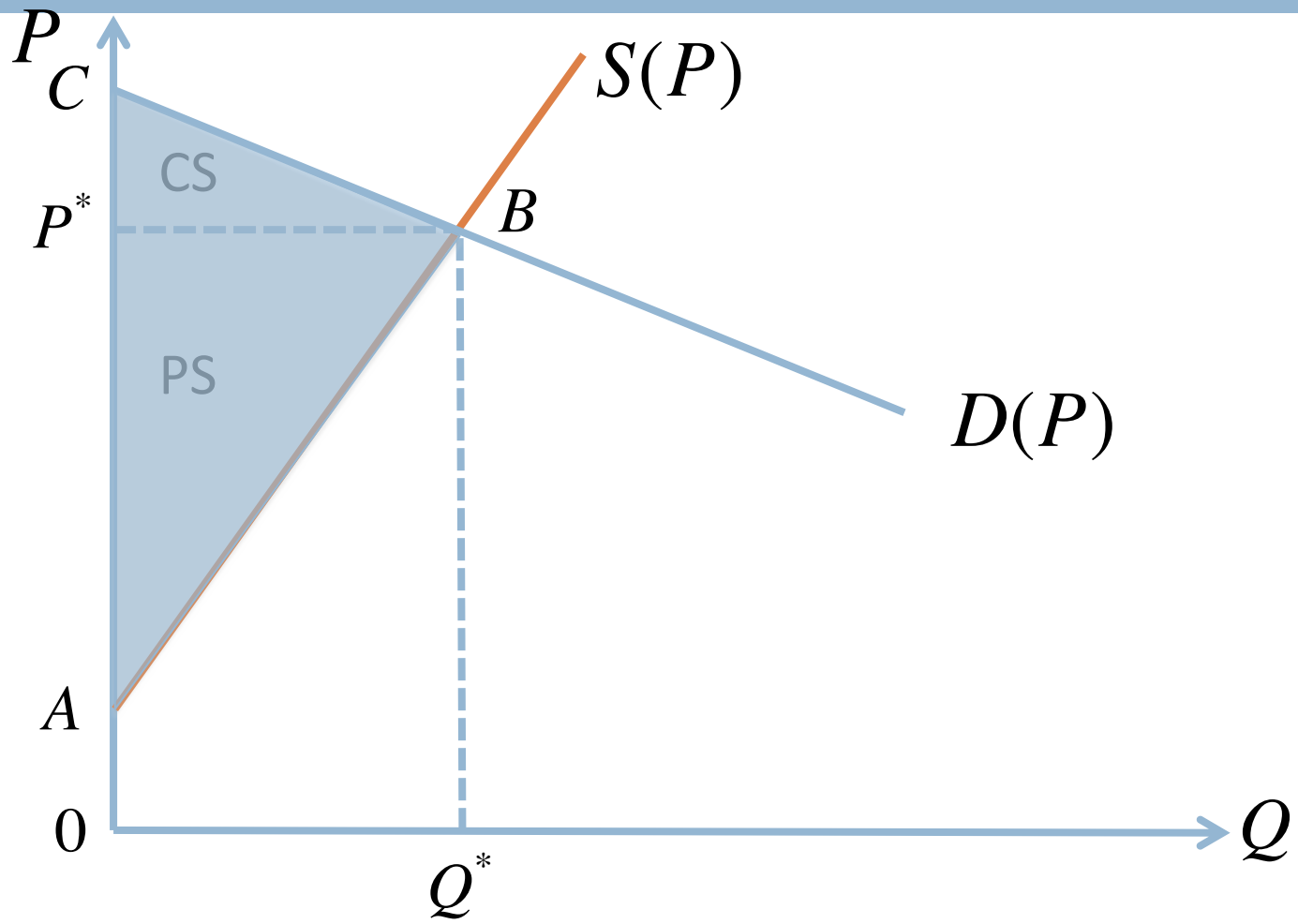
Total surplus=total benefit-total non-sunk cost



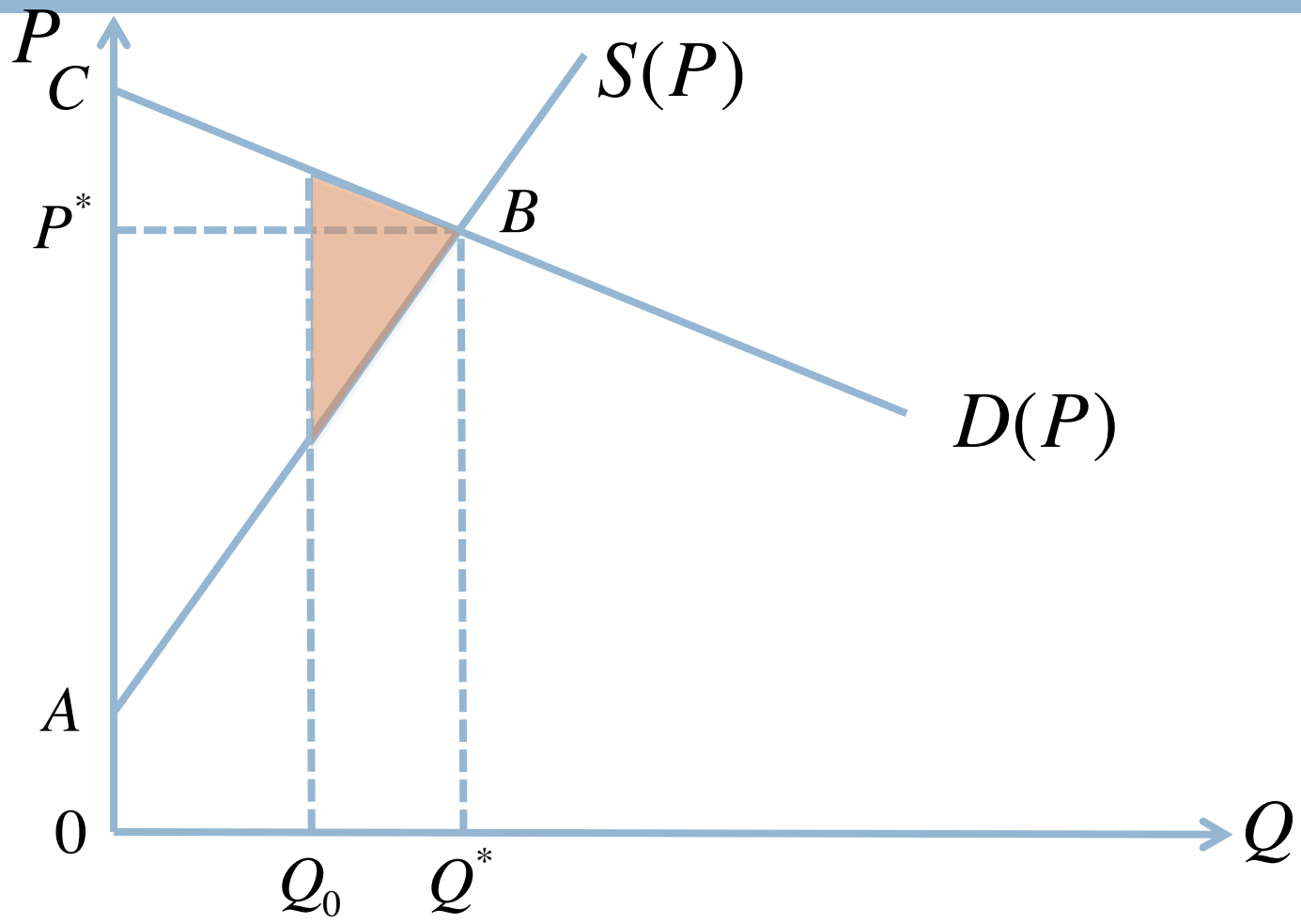
Economic Efficiency and Deadweight Loss

- Definition 12.1 In a partial equilibrium model, an output level (quantity) is *efficient* if at that output level, the total surplus in the market is maximized
- Definition 12.2 If the output level is not efficient, the market suffers from *deadweight loss*
  - Total surplus is not maximized
  - Deadweight loss is the net loss in total surplus

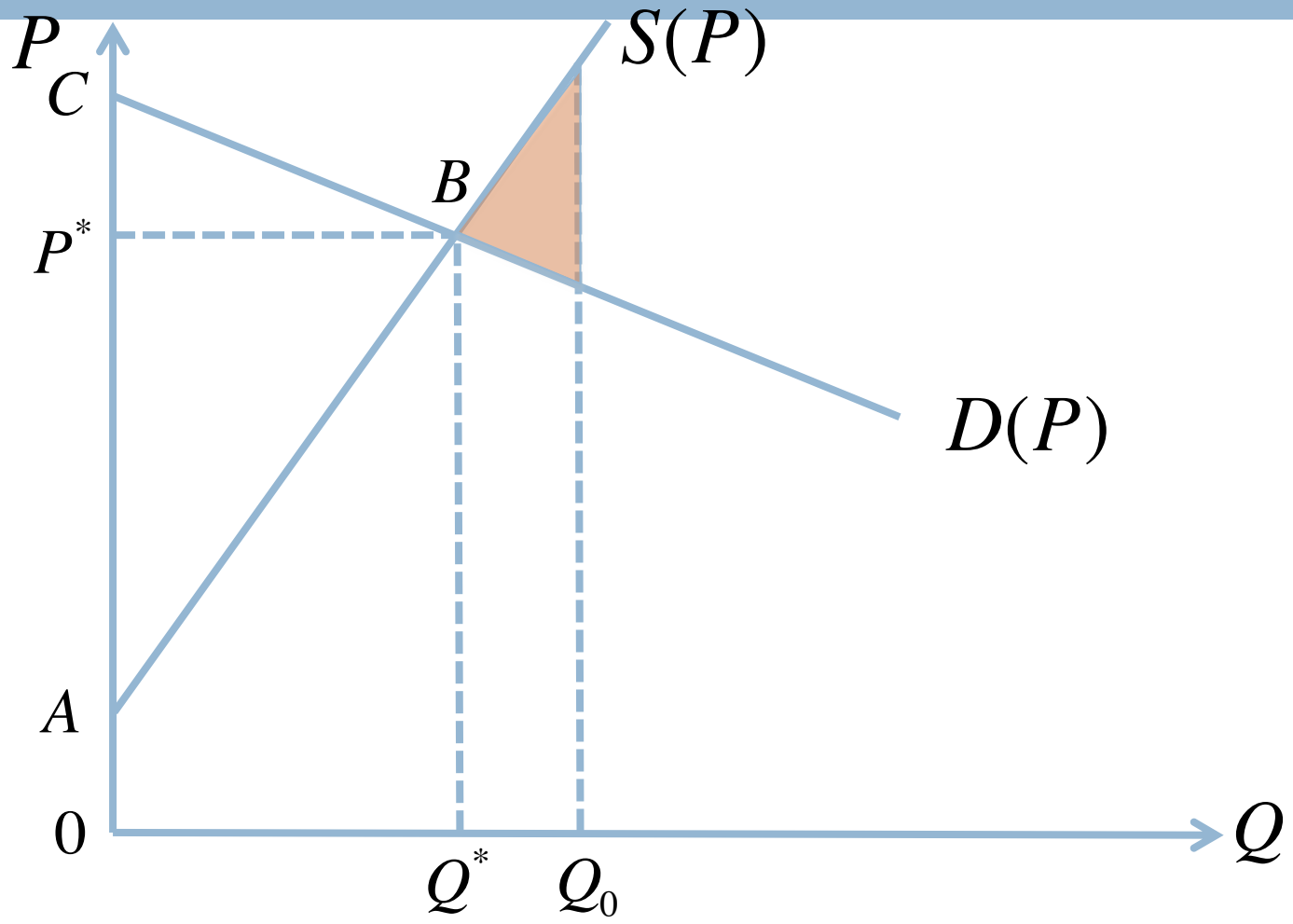
Equilibrium in Perfectly Competitive Market is Efficient



Underproduction



Overproduction



Part 2

Tax and Subsidy

Excise Tax

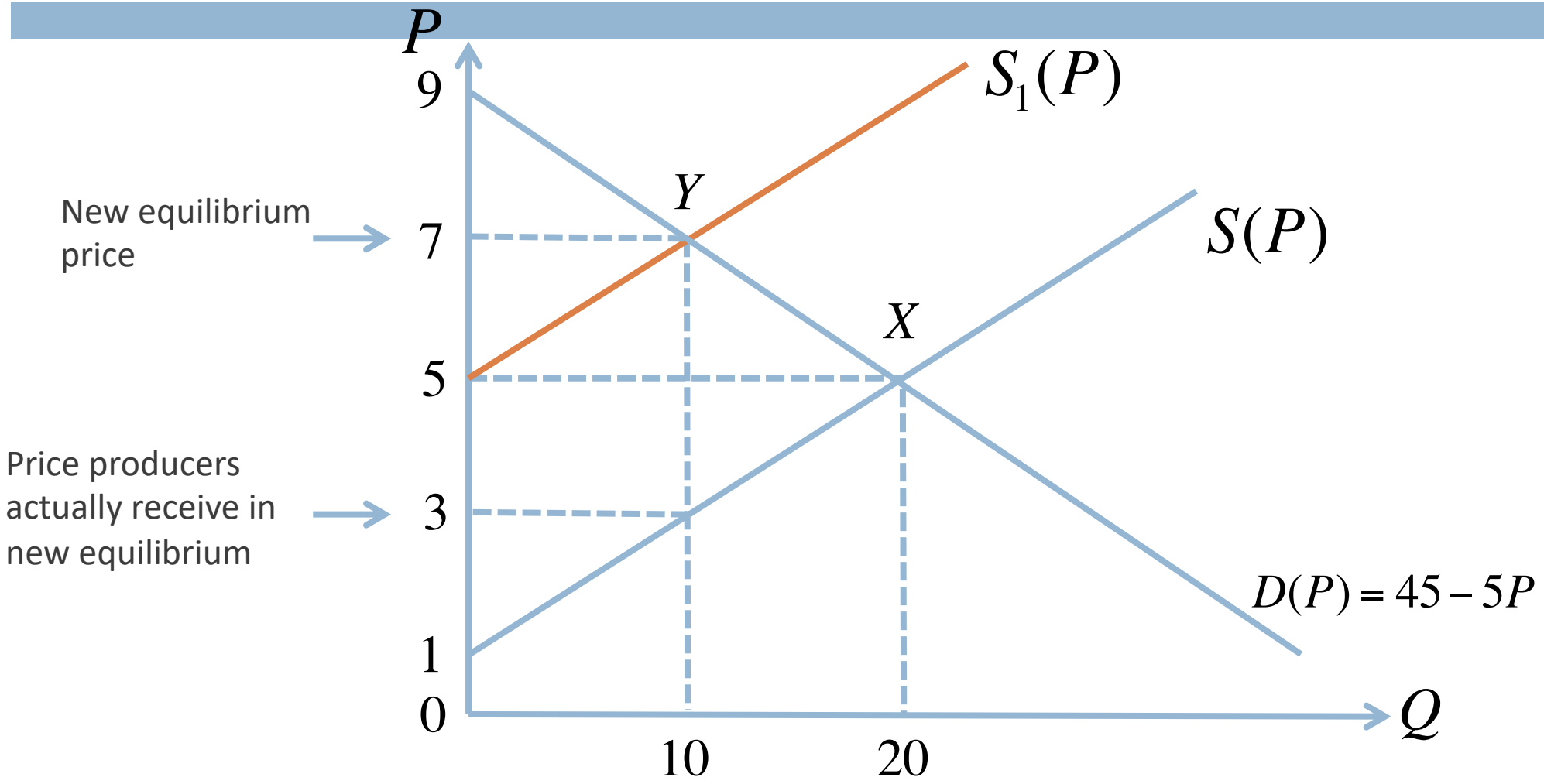
- Suppose the government imposes a $4 per unit tax on producers
- Suppose in the absence of tax, the market supply curve is

$$S(P) = \begin{cases} 5P - 5 & if \quad P \geq 1 \\ 0 & if \quad P < 1 \end{cases}$$

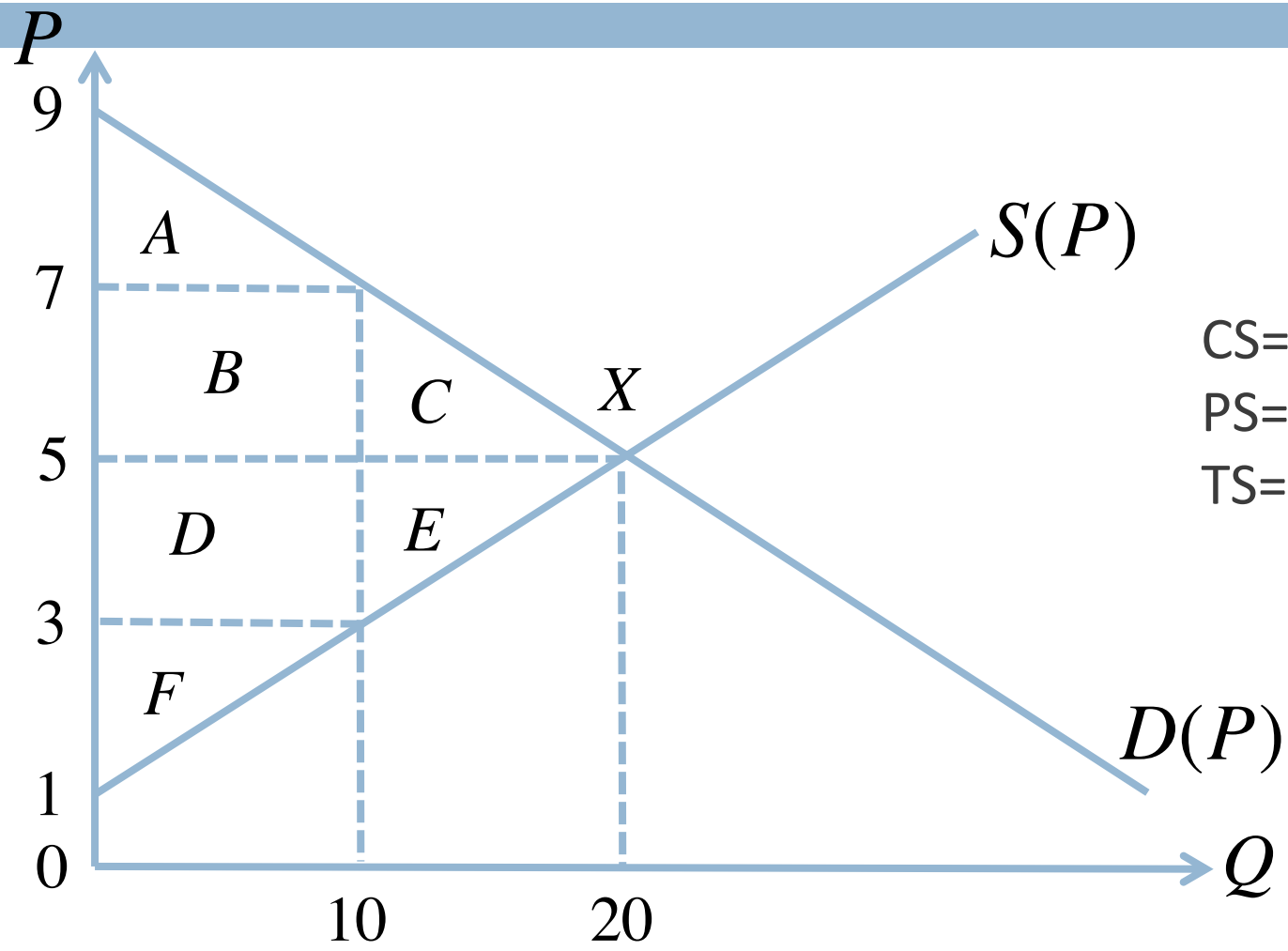
- With the tax, for any market price *P*, producers only receive *P*-4

$$S_1(P) = \begin{cases} 5(P-4) - 5 = 5P - 25 & if \quad P \geq 5 \\ 0 & if \quad P < 5 \end{cases}$$

How does tax change the equilibrium?



Welfare when There is No Tax



CS=A+B+C

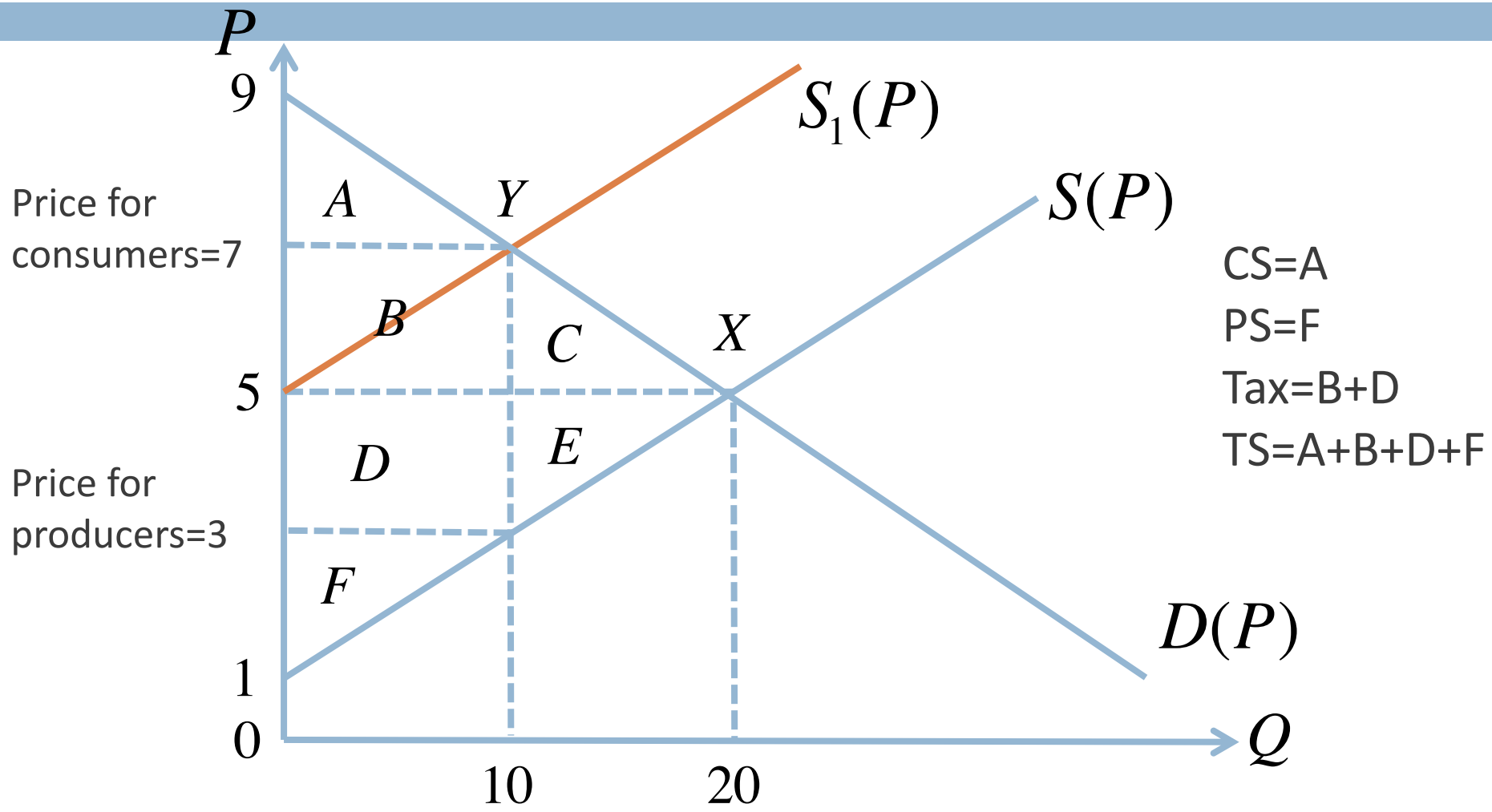
PS=D+E+F

TS=A+B+C+D+E+F

Calculating Welfare when There is No Tax

- Equilibrium is at point X
- Equilibrium price is $5 and equilibrium quantity is 20
- Consumer surplus=1/2*20*(9-5)=40
- Producer surplus=1/2*20*(5-1)=40
- Total surplus=40+40=80

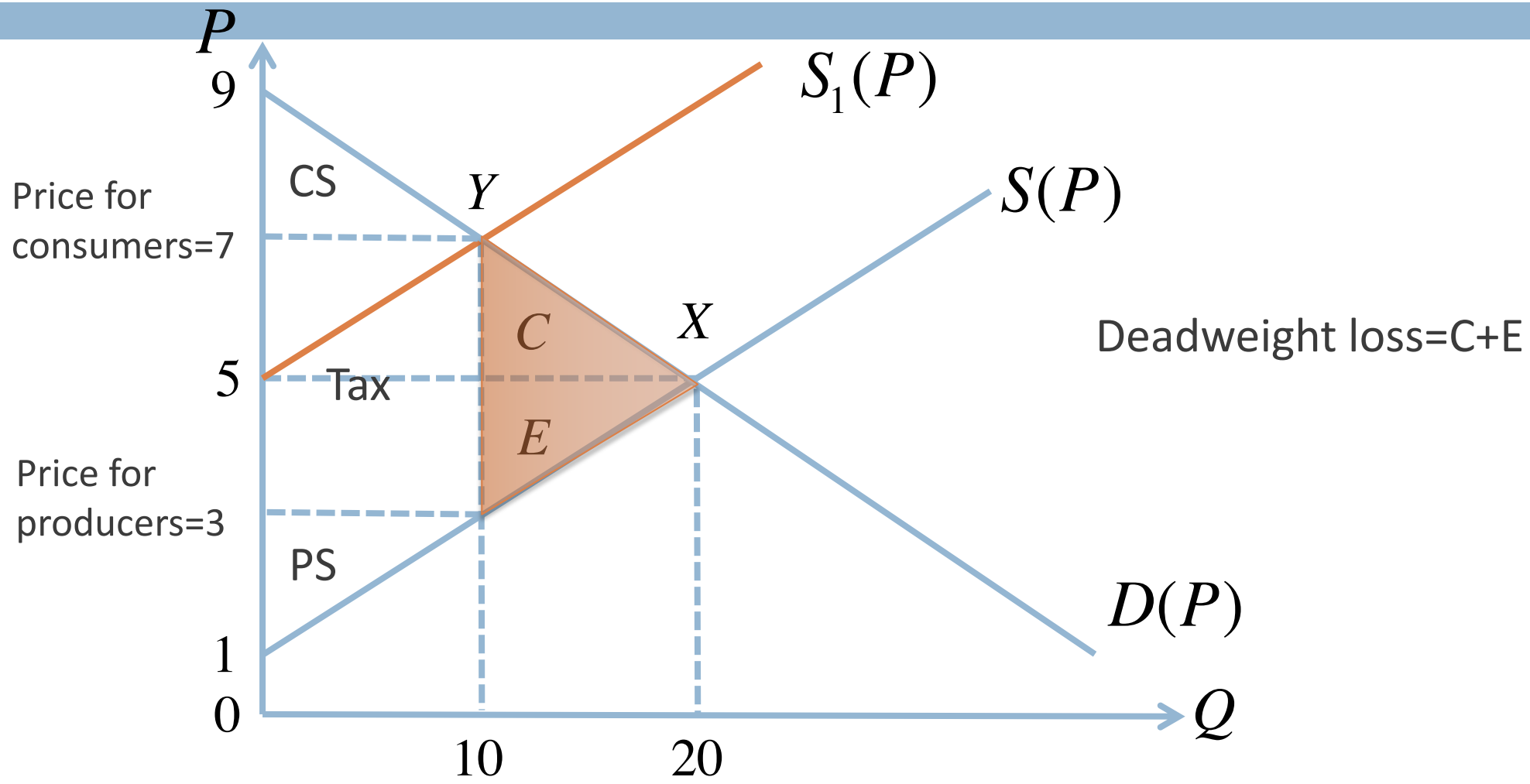
Welfare when There is a $4 Excise Tax



Calculating Welfare when There is Tax

- Equilibrium is at point Y
- Equilibrium price is $7 (the price consumers pay) and equilibrium quantity is 10
- Producers receive a price of $3
- Consumer surplus=1/2*10*(9-7)=10
- Producer surplus=1/2*10*(3-1)=10
- Tax=4*10=40
- Total surplus=10+10+40=60

Deadweight Loss with Tax



Calculating Deadweight Loss

- Reduction in total surplus due to tax
- Total surplus before tax=80
- Total surplus after tax=60
- Deadweight loss=80-60=20
- Deadweight loss is also the area of C+E
  - =1/2*(7-3)*(20-10)=20

Subsidy

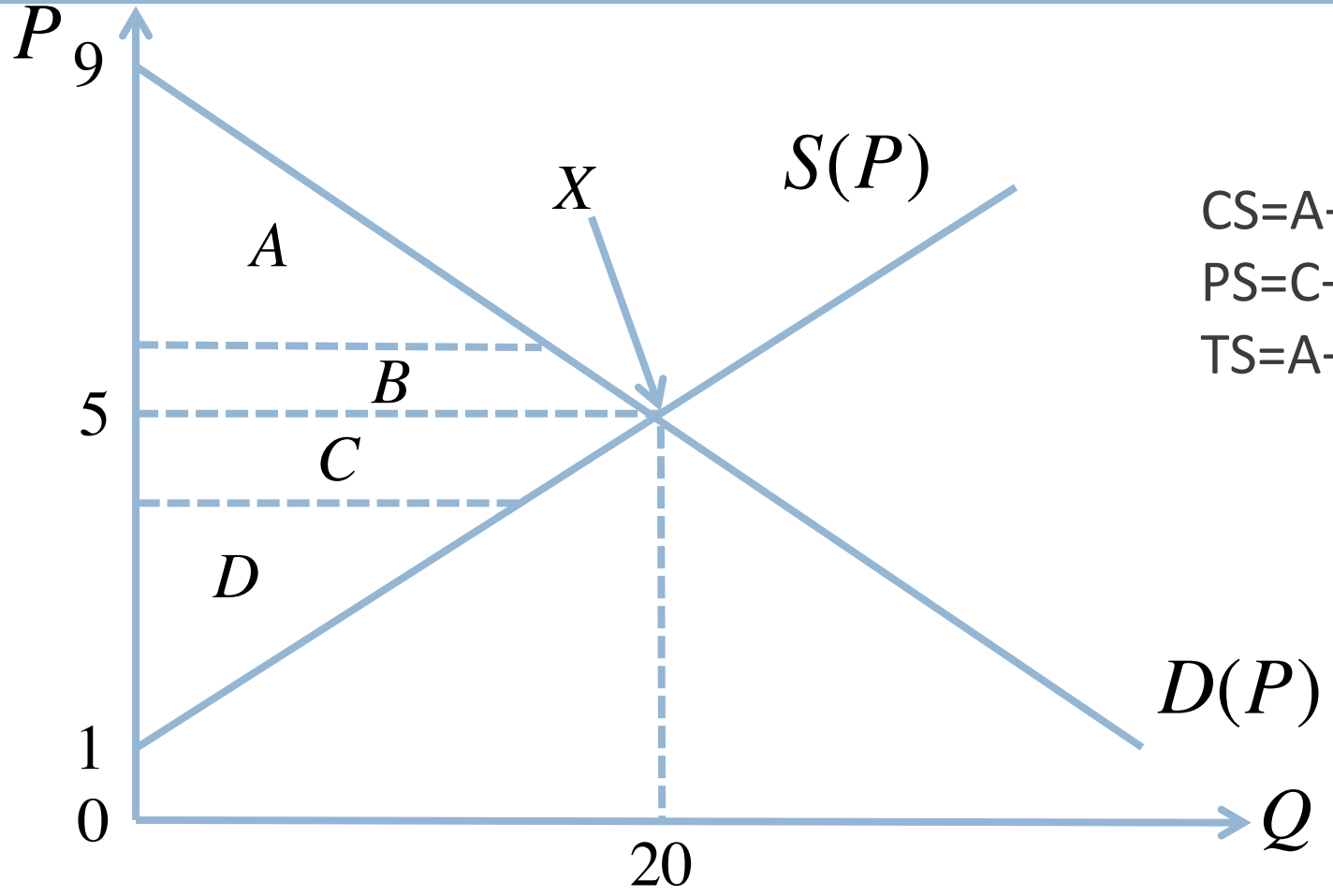
- Suppose now government gives $2 per unit subsidy to producers
- Without subsidy, the supply curve is

$$S(P) = \begin{cases} 5P - 5 & if \quad P \geq 1 \\ 0 & if \quad P < 1 \end{cases}$$

- With the subsidy, for any market price *P*, producers receive *P*+2

$$S_1(P) = -5 + 5(P + 2) = 5 + 5P$$

Welfare when There is No Subsidy

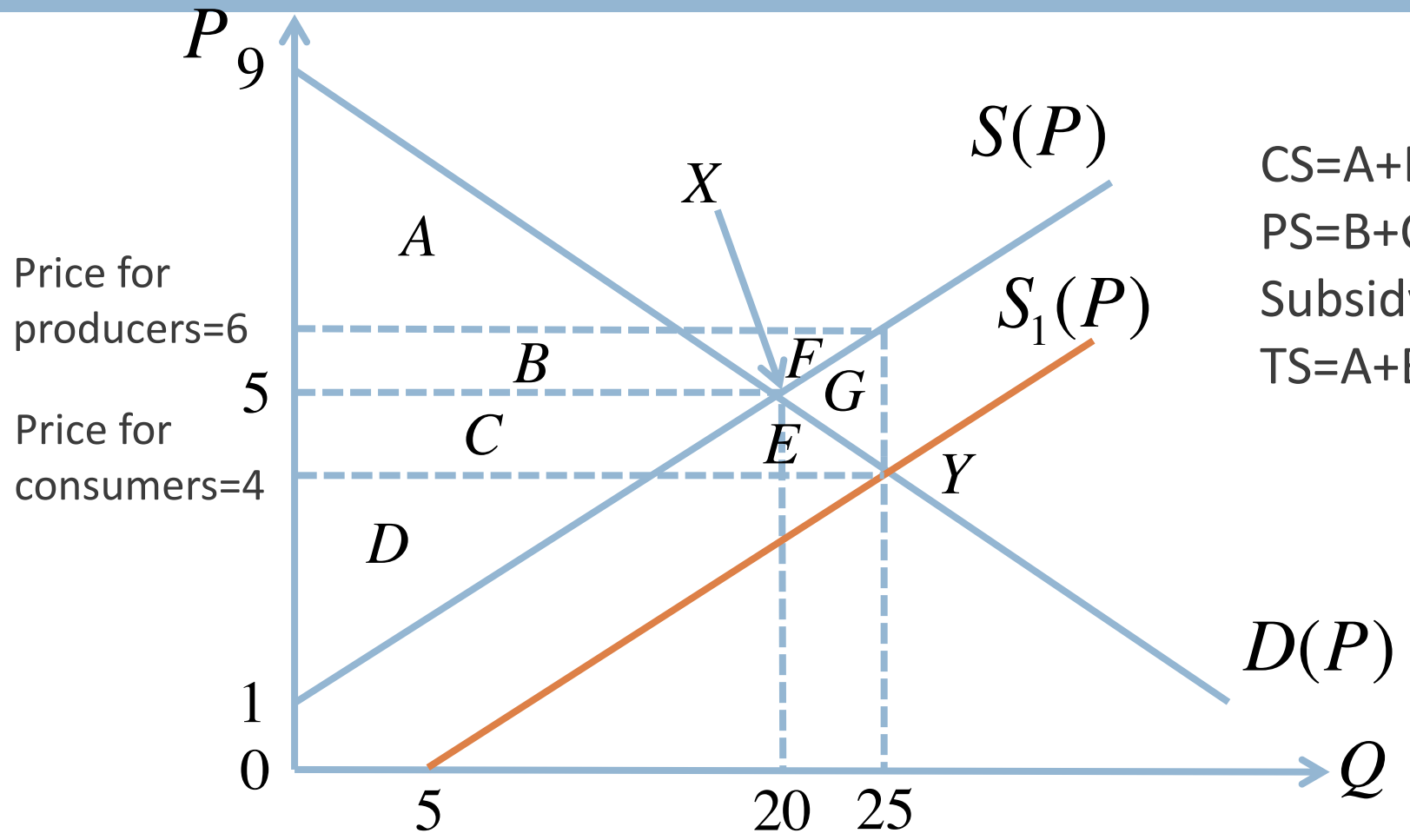


CS=A+B

PS=C+D

TS=A+B+C+D

Welfare when There is a $2 Subsidy



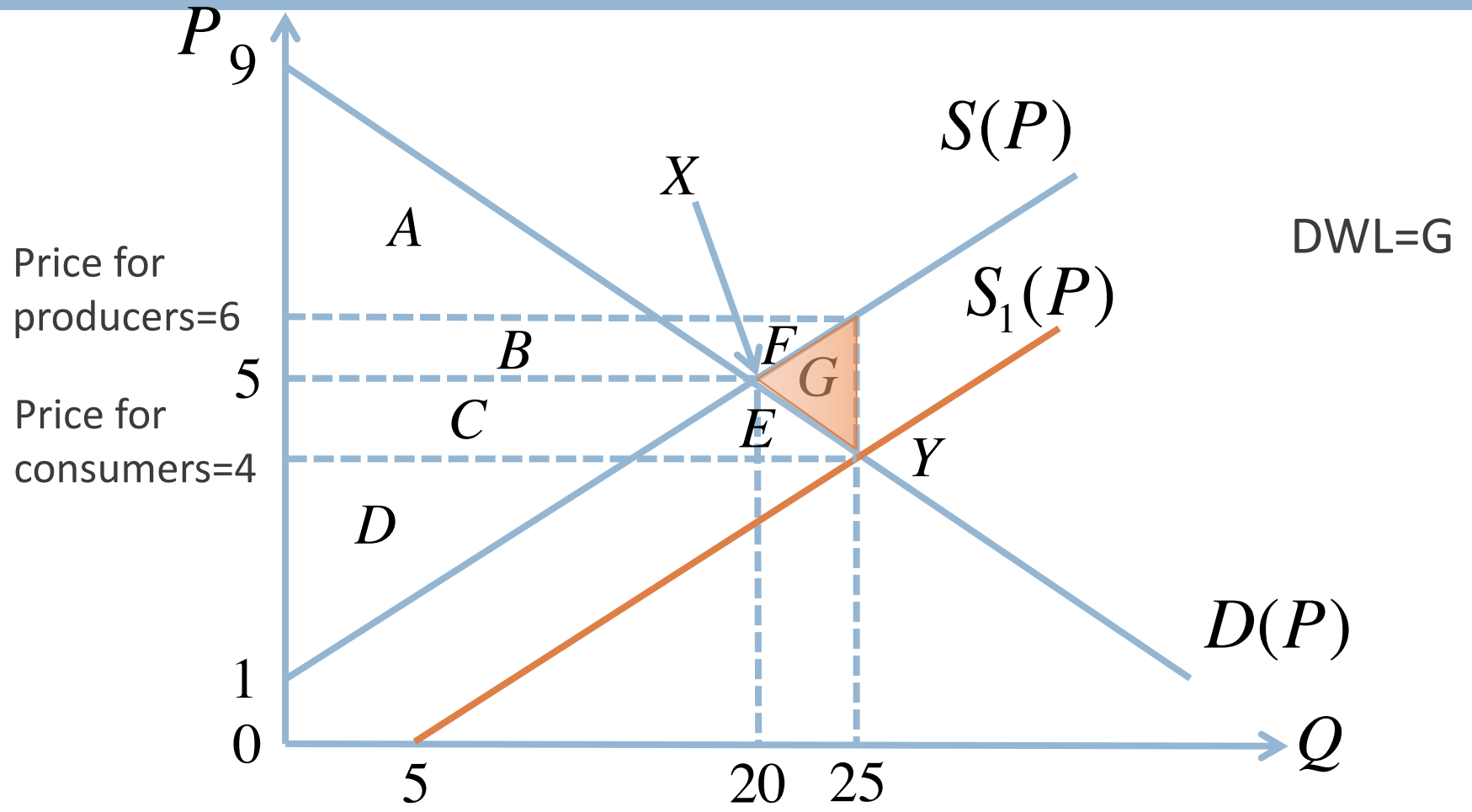
CS=A+B+C+E

PS=B+C+D+F

Subsidy=-B-C-E-F-G

TS=A+B+C+D-G

Deadweight Loss due to Subsidy



DWL=G

Where does deadweight loss come from?

- With tax, the consumption and production of the good is too little
- With subsidy, the consumption and production of the good is too much
- In both cases, we have *quantity distortion*
  - Quantity consumed and produced is different from the efficient quantity

Part 3

Price Supports in Agricultural Sector

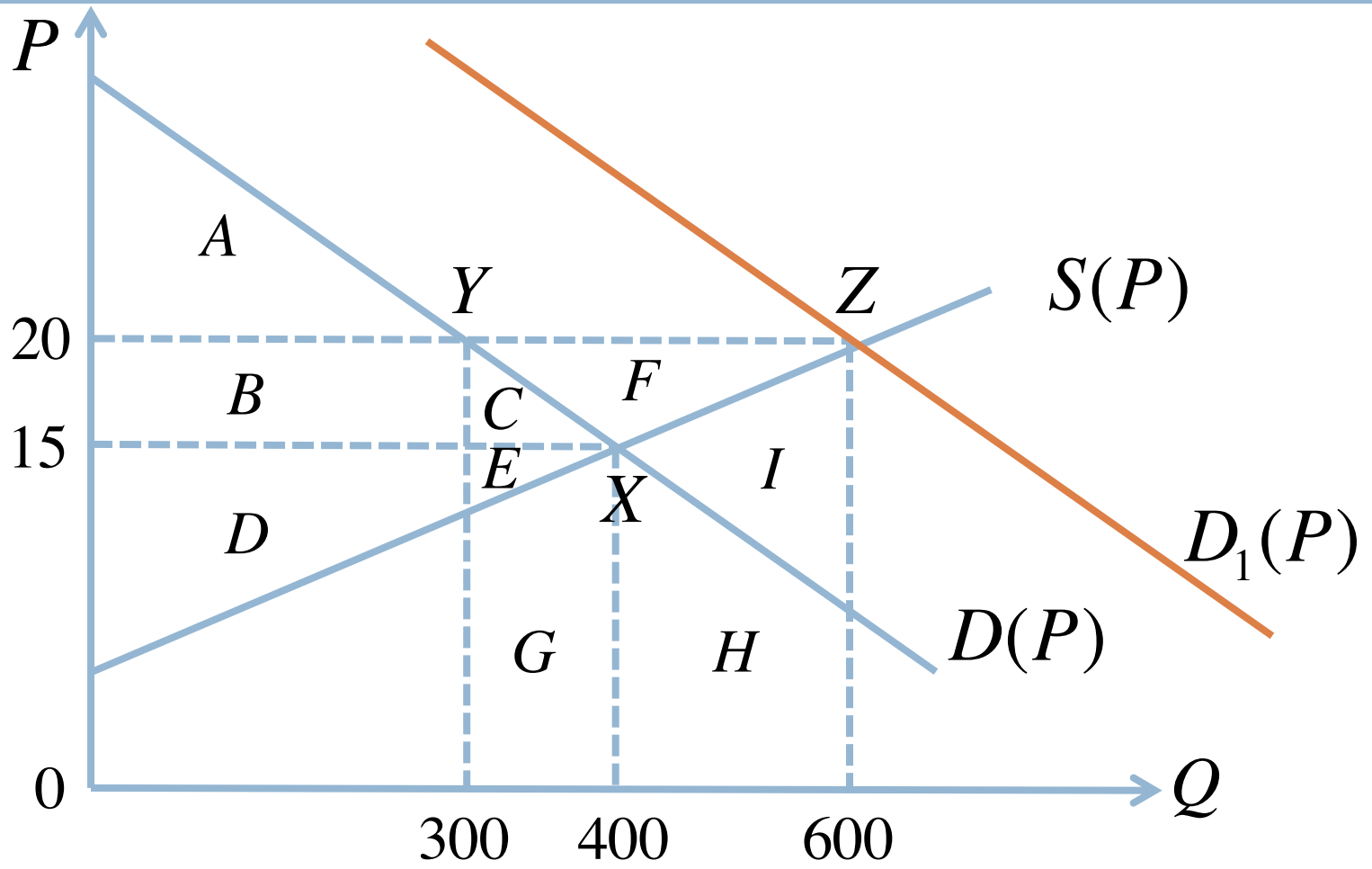
How to increase the price of rice?

- Consider the market for rice
- Suppose the market is perfectly competitive
  - Free market equilibrium price is $15 per ton, quantity is 400 million tons
- Suppose the government intends to raise the price of rice to $20 per ton
- What should the government do?

Government Purchase

- Suppose the government adopts the *government purchase* program
  - The target price is $20 per ton
  - The government will buy as much rice as needed to keep the price at $20 per ton
  - The government stores the rice
    - Assume resale is not possible
- The government creates new demand

Equilibrium under Government Purchase



Welfare with and without Government Purchase

- Without government purchase
  - CS=A+B+C
  - PS=D+E
  - TS=A+B+C+D+E
- With government purchase
  - CS=A
  - PS=B+C+D+E+F
  - Government expenditure=-C-E-F-G-H-I
  - TS=A+B+D-G-H-I

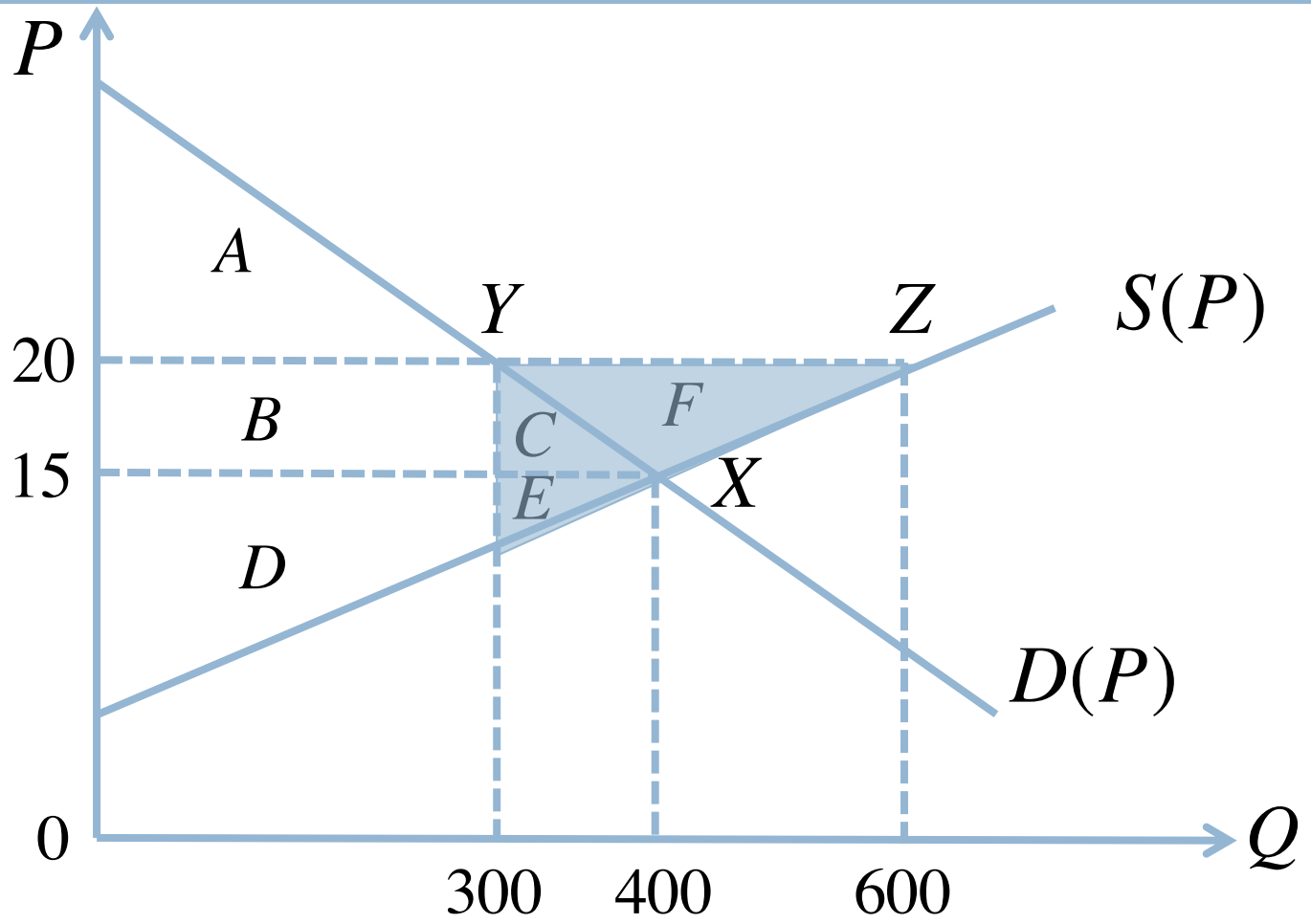
Example: Thai Rice Price Support

- Yingluck's government bought rice from farmers at price 50% higher than the market price
  - A promise they made in the 2011 election
- The results
  - Millions of tons of rice in warehouses
  - Unpaid farmers
  - Corruption
- A short video by FT on the rice subsidy scheme
  - https://www.youtube.com/watch?v=Y9sq9CzpAX4&t=6s

Acreage Limitation Program

- Suppose the government gives financial incentives to the farmers to limit supply
  - At the price of $20 per ton
  - Farmers are willing to supply 600 million tons
  - Government pays cash to the farmers for reducing their production to 300 million tons
- How much does the government need to pay?
  - Government should compensate farmers for the loss in producer surplus due to limiting production to 300

Equilibrium under Acreage Limitation Program



Welfare with and without Acreage Limitation Program

- Without acreage limitation program
  - CS=A+B+C
  - PS=D+E
  - TS=A+B+C+D+E
- With acreage limitation program
  - CS=A
  - PS=B+C+D+E+F
  - Government expenditure=-C-E-F
  - TS=A+B+D

Part 4

Final Review

Basic Information

- 28 Apr, 9 am to 11 am
- Coverage
  - Comprehensive
  - Consumer theory (lecture 1-4) accounts for about 10%
- Format
  - Open book
  - Pen and paper
- Type of questions
  - MCQ
  - Structured questions

Exam Requirements

- ~~Do NOT write in pencil~~
- ~~Memorize your tutorial number~~
- Do NOT write your name on the exam script
- Bring your student ID card
  - And place it on your desk
- Bring your own draft paper
- You are NOT allowed to append your own draft paper to the exam script
  - Write all your answers on the exam script

Exam Requirements Cont'

- You are allowed to
  - Refer to any printed or written material
  - Use a non-programmable calculator
- You are not allowed to
  - Communicate with others
  - Use any other electronic device
- Put your bag away and leave your phone in your bag!

Logistics

- Consultation hours
  - By appointment only (Use the Zoom link for “consultation by appointment”)
    - 20-21, 25-26 Apr
    - Sign up on LumiNUS (no more than 3 slots per person)
    - Let me know in advance if you would like to meet f2f
  - Open consultation (Use the Zoom link for “consultation by appointment”)
    - 22 Apr: 1 pm to 4 pm
    - 27 Apr: 2 pm to 5 pm
- Grade change deadline
  - 5:30 pm, 27 Apr
- I will not answer emails after 5:30 pm on 27 Apr

Safety Measures

- You need to show the NUSafe green pass on the uNivUS app to be admitted to the hall
  - The invigilator will check your pass at the entrance
- You will NOT be allowed to enter the exam hall if you do not have a green pass
- Do NOT congregate outside the venue before or after the exam
  - You will be allowed to enter the hall 15 minutes before the exam starts
- Keep your masks on during the exam

What if you are COVID positive?

- You should NOT take the final exam if
  - You are COVID positive on the exam day
  - Or you are still within the 72-hour self-isolation period
- A positive result will excuse you from taking test for 7 days
  - If you test positive on or after 22 Apr (Friday)
  - You can choose not to take the final exam even if you test negative before the exam day
- If you miss the final exam due to COVID-19
  - You need to apply for special consideration

Special Consideration

- If you miss the final exam due to other reasons
  - Apply for special consideration
- I cannot arrange a makeup final with you directly
- If you miss the final exam and do not apply for special consideration
  - You will get 0 for the final exam
- What happens after you apply for special consideration?
  - You will get a makeup if it is due to COVID-19
    - Let me know if this is your graduating semester
  - You may or may not get a makeup if it is due to other reasons

Our Topics

- Consumer Theory
- Exchange
  - Pareto efficiency
  - Competitive equilibrium
  - First Welfare Theorem
  - Walras' law
- Production and Cost minimization
  - Production function
  - Short-run and long-run cost functions
  - Demand functions for inputs
  - Relationship between short run and long run

Our Topics Cont'

- Perfect competition
  - Firm's supply curve
  - Short-run equilibrium vs. long-run equilibrium
  - Long-run market supply curve
  - Economic rent
- Government Interventions
  - Tax and subsidy
  - Government purchase vs. acreage limitation

Post-Midterm Reflection

1. **Up to week 6, what has been part of your weekly learning routine (things that you do regularly)? Check all that apply.**

Answered: 141 Skipped: 31

Options	*Count*	*Pct*
Watch the recorded lecture.	133	**20.34 %**
Attend the live session.	66	**10.09 %**
Study/review the lecture notes after each lecture.	85	**13 %**
Solve the tutorial questions.	127	**19.42 %**
Read the tutorial and/or quiz solutions posted on LumiNUS.	98	**14.98 %**
Make your own notes/summary.	83	**12.69 %**
Discuss with your classmates/friends.	62	**9.48 %**

Post-Midterm Reflection Cont'

2. What did you do to prepare for the midterm? Check all that apply.

Answered: 141 Skipped: 31

Options	*Count*	*Pct*
Read the lecture notes or watch the lectures for the first time.	38	**5.59 %**
Reread the lecture notes or rewatch the lectures.	118	**17.35 %**
Solve quiz, tutorial, or other practice questions for the first time.	58	**8.53 %**
Redo quiz, tutorial, and other practice questions.	118	**17.35 %**
Make your own notes.	102	**15 %**
Review your own notes.	95	**13.97 %**
Quiz yourself.	54	**7.94 %**
Explain concepts or questions to someone else in your own words.	37	**5.44 %**
Reflect on what you have learned (e.g. what are the learning points of each question? which topics do you find challenging and why?)	60	**8.82 %**

Post-Midterm Reflection Cont'

4. Which of the following factors cause you to lose marks in the midterm? Check all that apply.

Answered: 134 Skipped: 38

Options	*Count*	*Pct*
Inadequate understanding of the concepts.	81	**17.69 %**
Not knowing how to approach the question.	69	**15.07 %**
Incorrect understanding of the exam question.	46	**10.04 %**
Algebra or arithmetic errors.	30	**6.55 %**
Other careless mistakes.	51	**11.14 %**
Time management.	99	**21.62 %**
Exam stress.	72	**15.72 %**
Other.	10	**2.18 %**

Some Common Responses from Midterm Reflection

- *Instead of rote memorisation of concepts and formulas, understand the concept and how the formulas come about*
- *Spend more time recalling and practicing instead of reading and making notes*
- *Do some timed-exercises*
- *Ask more questions, come for consultation*
- *Search for more practice problems online*
  - This is not recommended

Tips for Final Review

- Try self quizzing of concepts
  - E.g., what is the expansion path? what is a long-run equilibrium?
- Try explaining the models/questions in your own words
  - E.g., what is the thought process?
- Try reflecting on what you have learned
  - E.g., what is the learning point of this model/question?
- Research shows that these are effective learning strategies