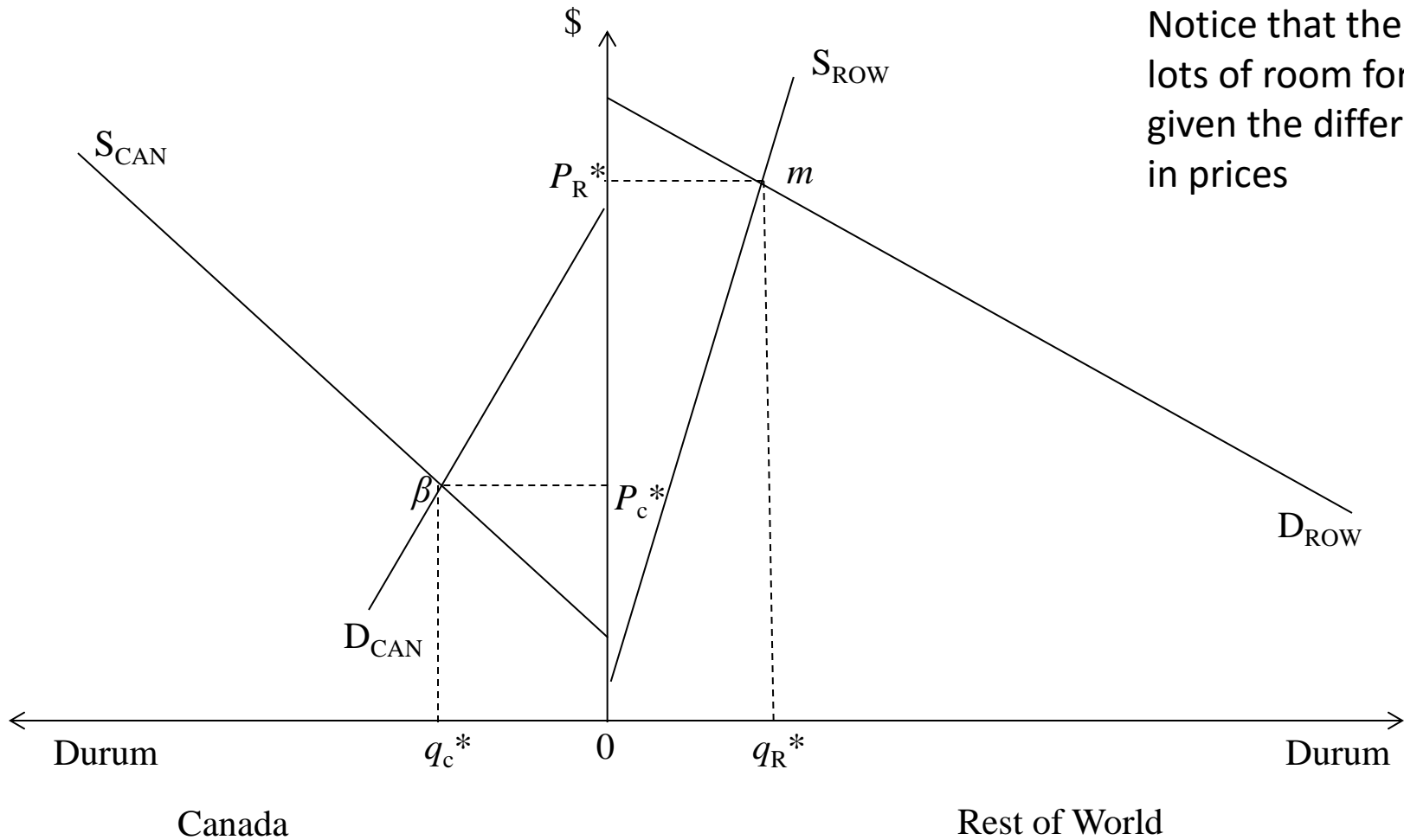


Wageningen Notes

G Cornelis van Kooten

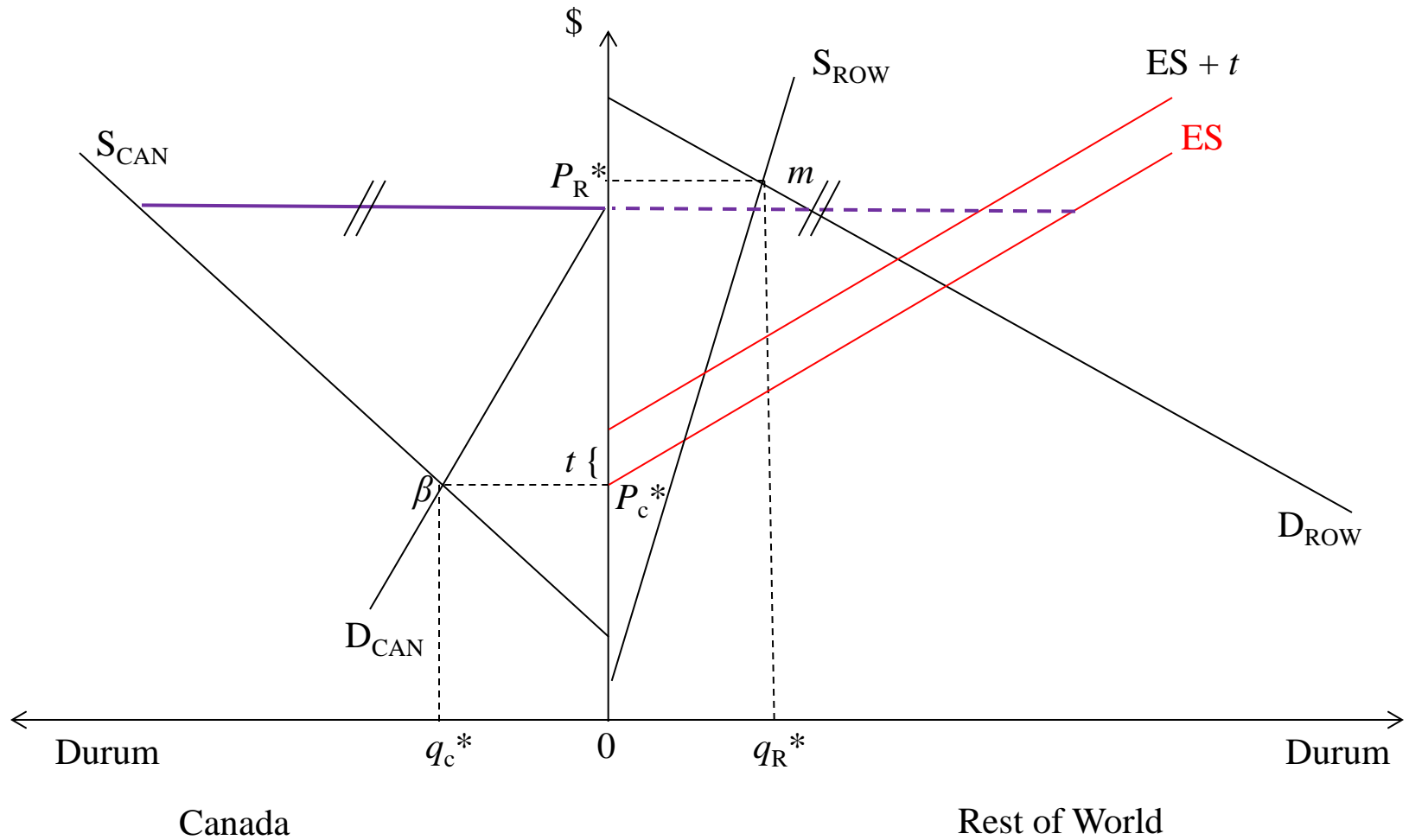
Construction of a back-to-back trade diagram

Back-to-back diagram: First the autarky situation

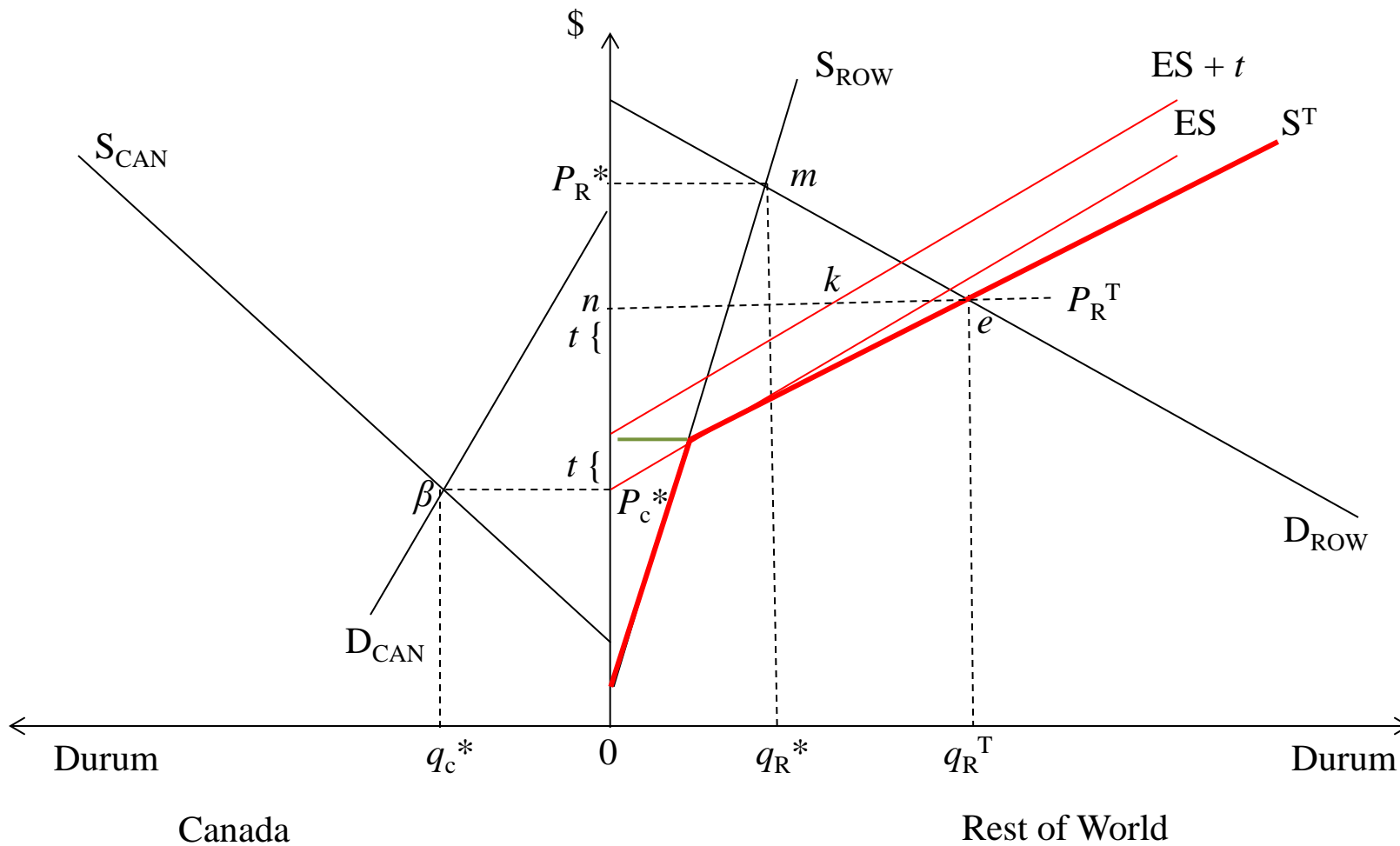


Notice that there is lots of room for trade given the difference in prices

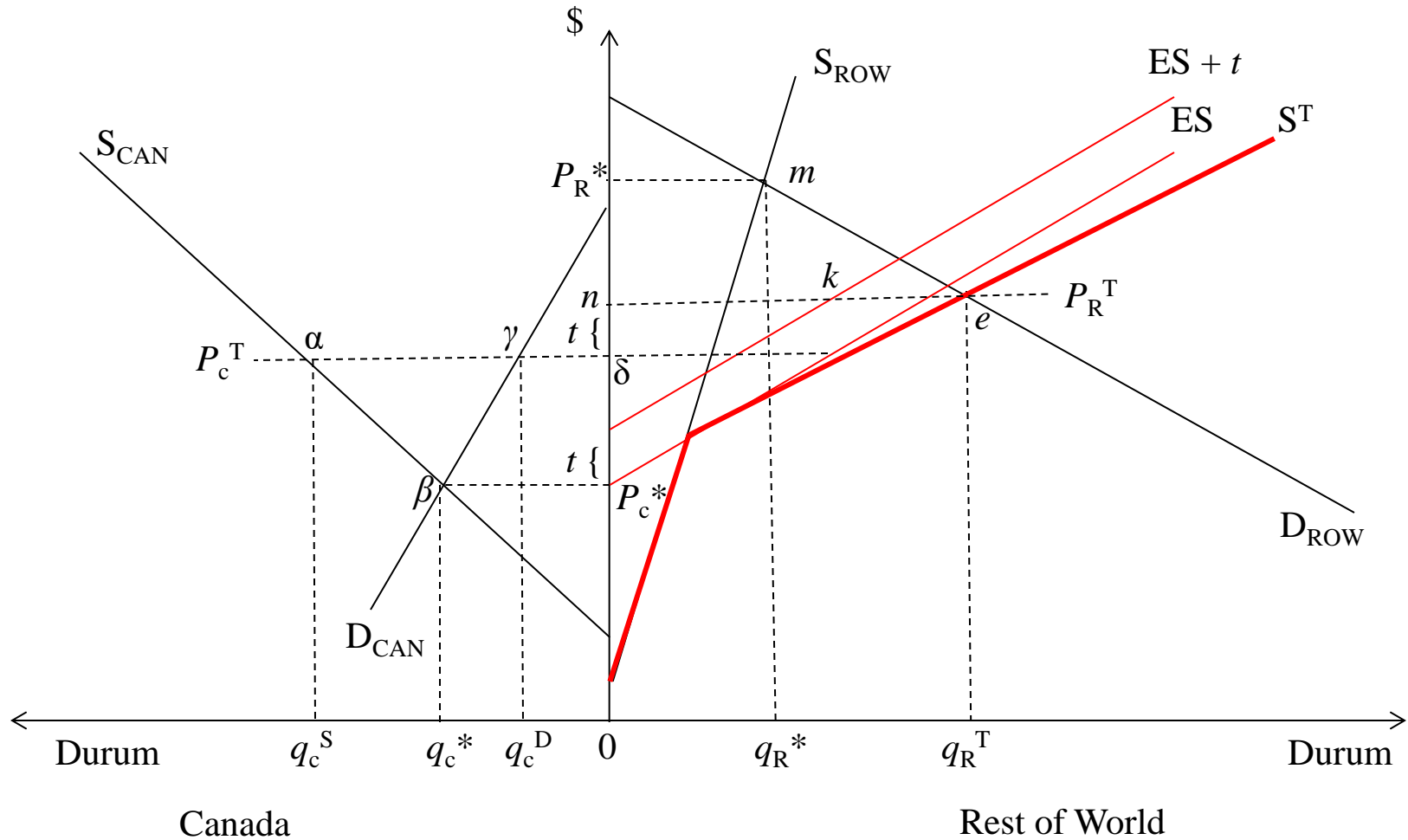
Back-to-back diagram:



Back-to-back diagram:

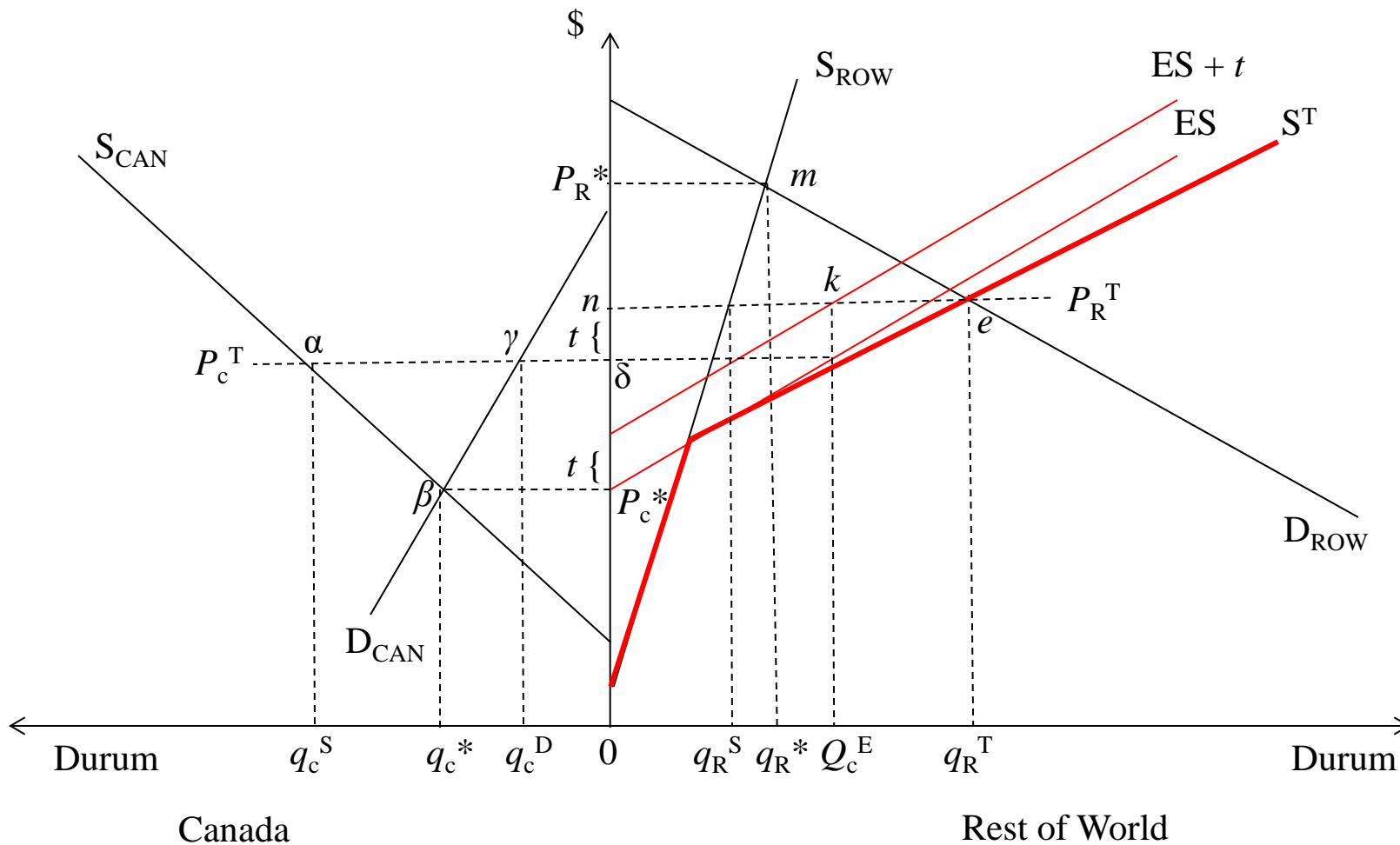


Back-to-back diagram:



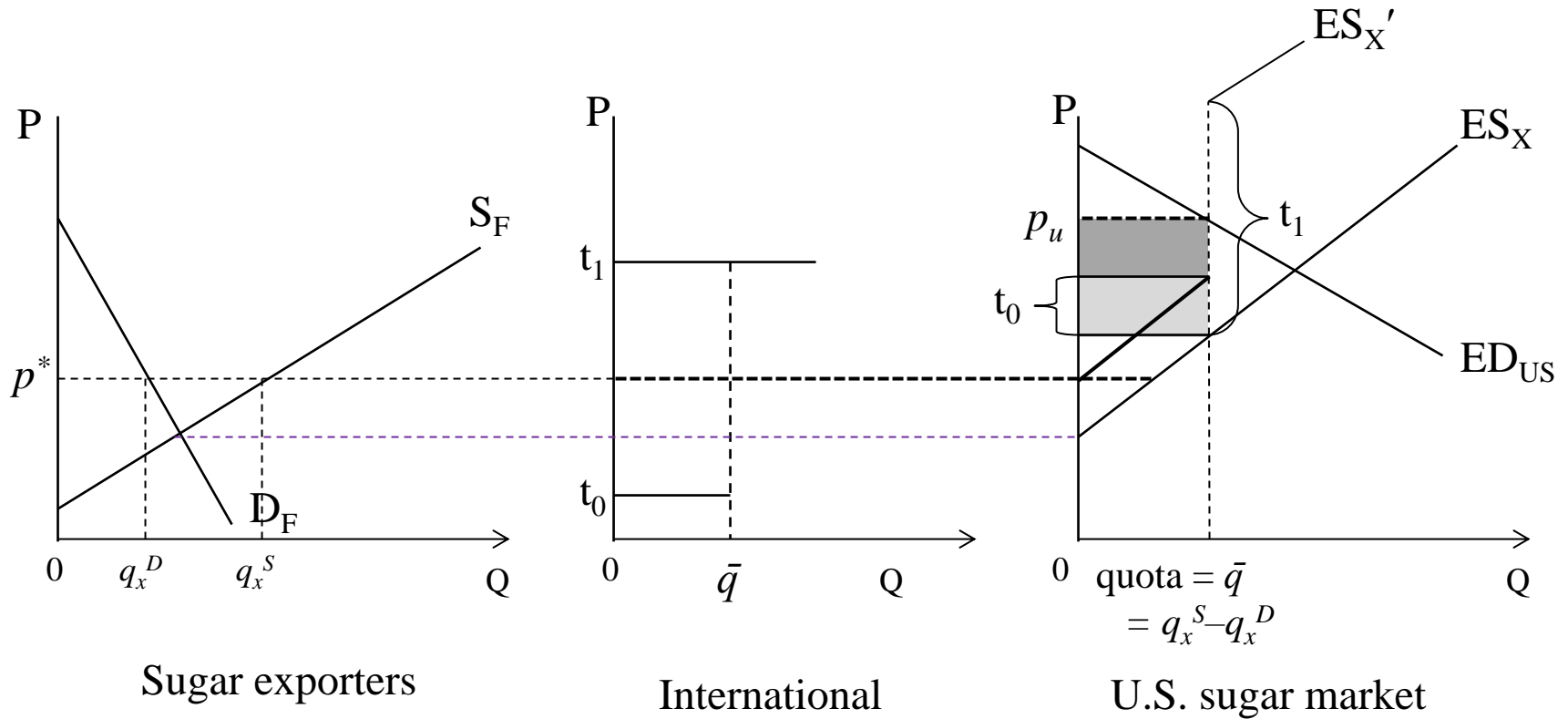
Back-to-back diagram:

S^T equals S_{ROW} plus $ES+t$
 $\alpha \gamma = n k = Q_C^E$
 q_R^S produced by rest of world



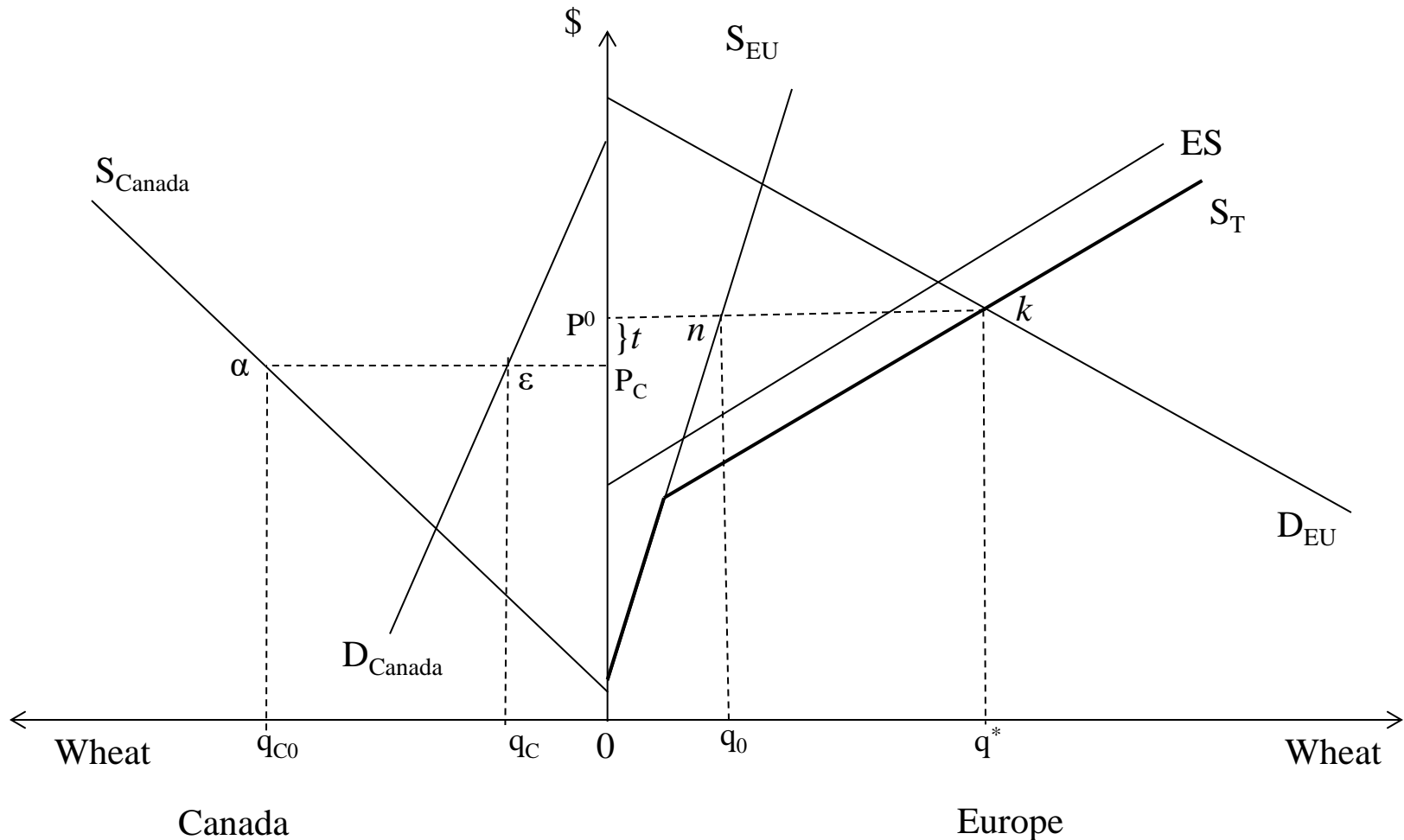
Tariff Rate Quota: What is it?

Tariff Rate Quota (TRQ)



EU TRQ on Canadian Durum Wheat

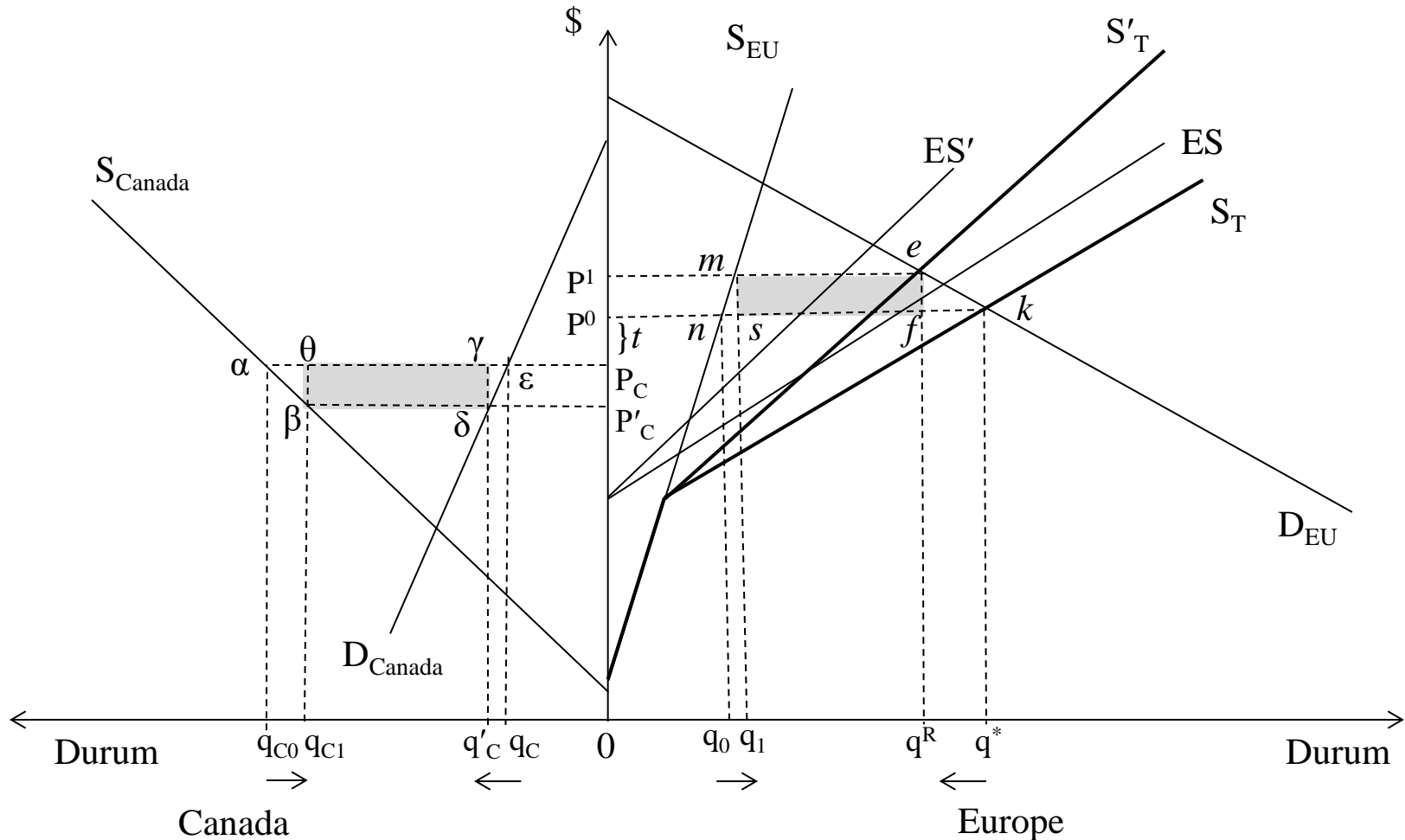
ES includes shipping & handling costs; $S_T = S_{EU} + ES$



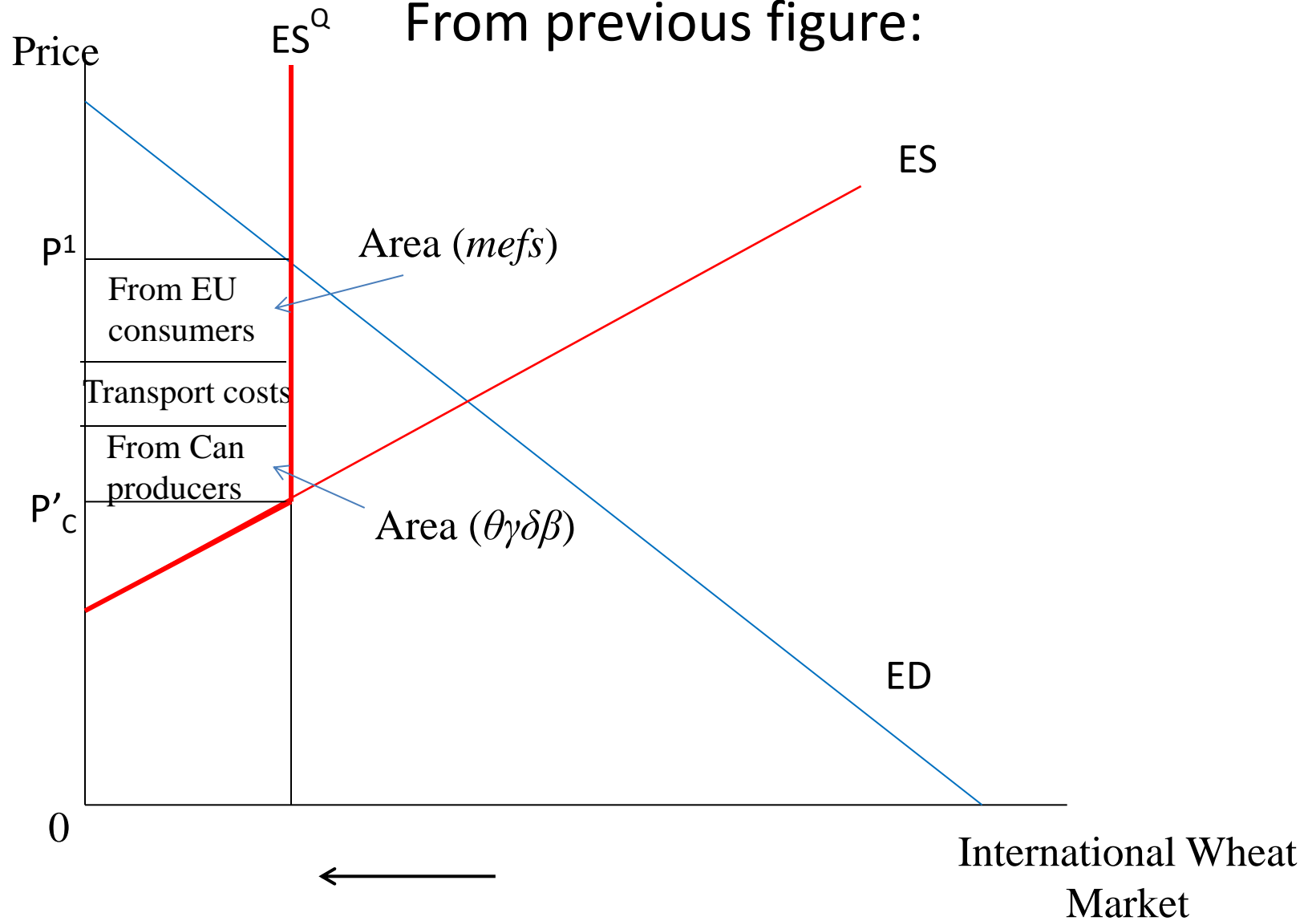
Ad valorem tax on imports of Canadian wheat to amount Q^R , then quota.

Tax revenue accruing to EU given by sum of two shaded areas.

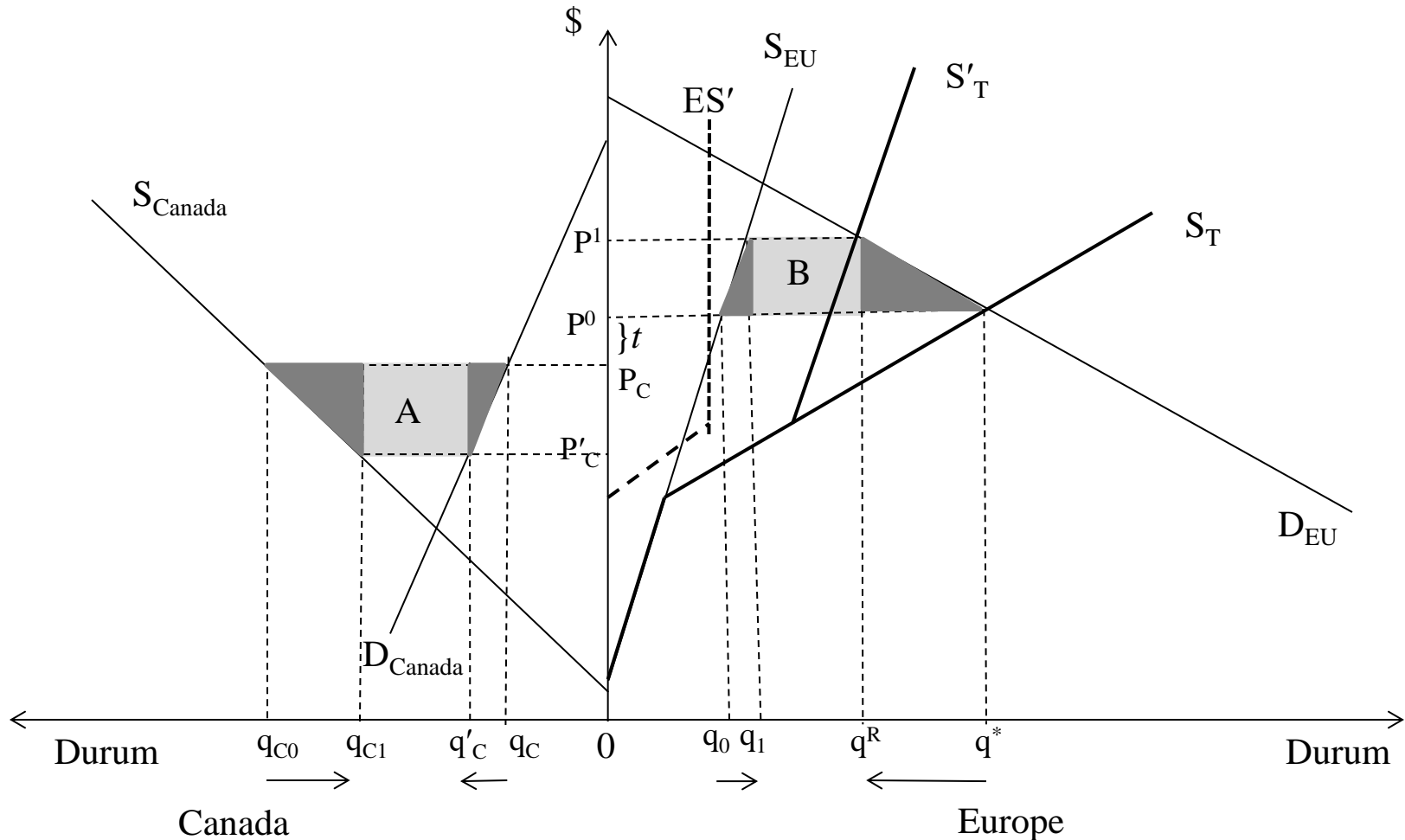
Deadweight losses by four small triangles.



From previous figure:



In this case, the quota is tighter so that the price difference rises; whether or not the tax revenue increases over the previous quota level depends on the elasticities of supply and demand as the deadweight losses (dark areas) increases thereby causing the income transfers (light shaded areas) actually to fall.



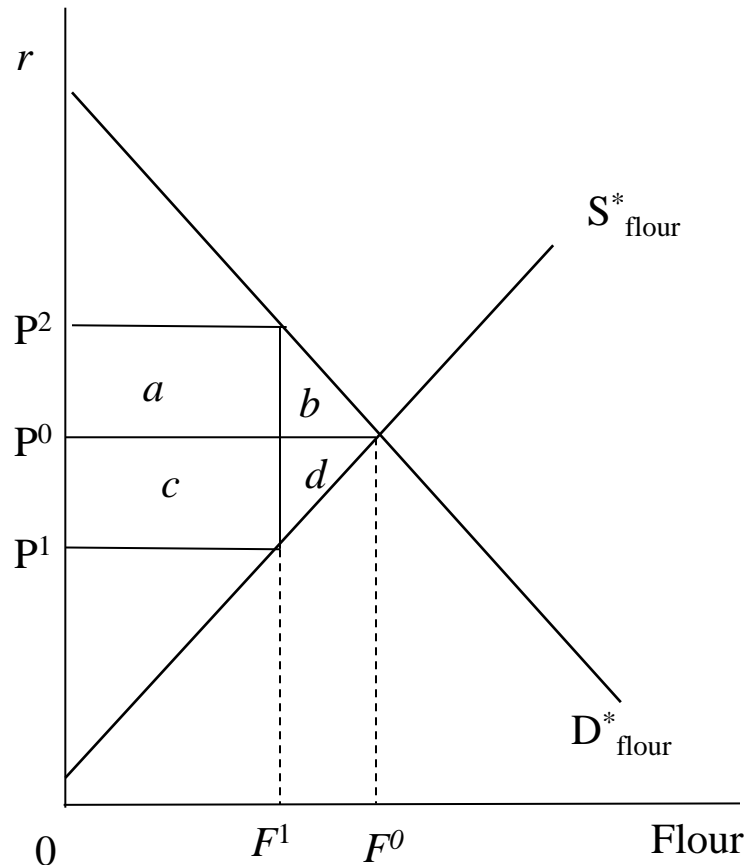
Now consider a spatial price equilibrium trade model: How do we know that the areas we measure in the durum market is correct? Do we measure things in other markets

By the fundamental equation of applied welfare economics, we know that the only things to measure in horizontal markets are when $P > MC$. In vertical markets the situation is a bit different.

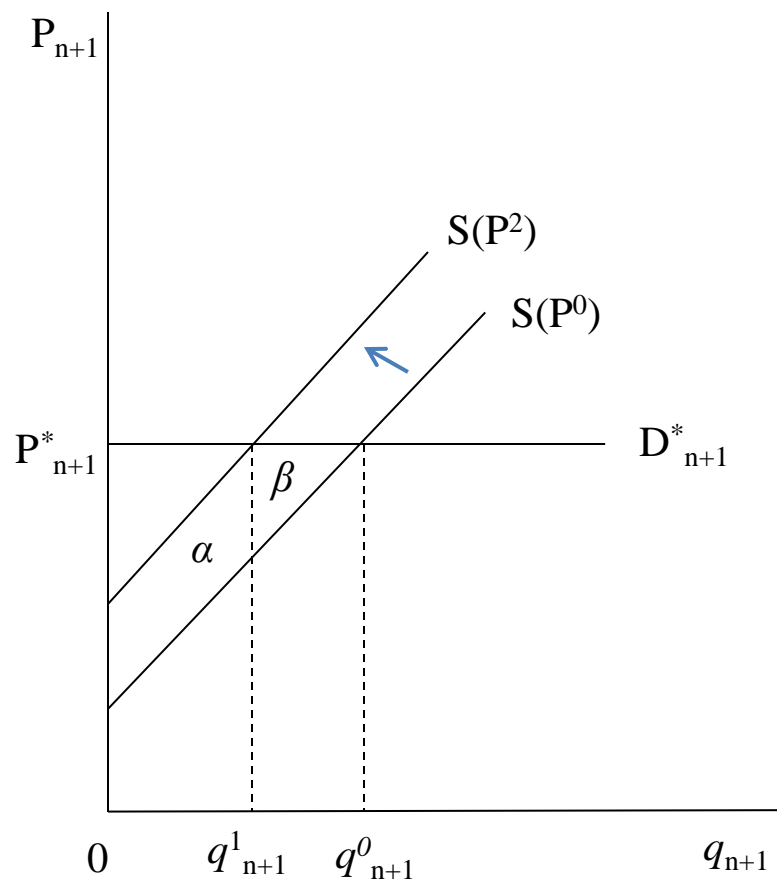
Consider the following example:

Machinery, fertilizer, etc. → wheat → flour → bread/pasta

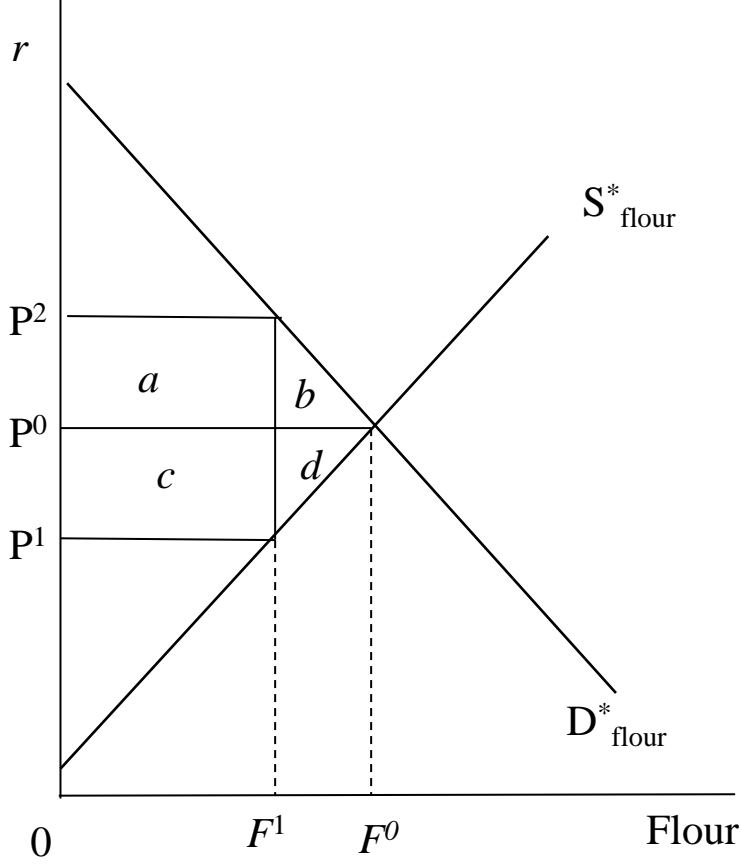
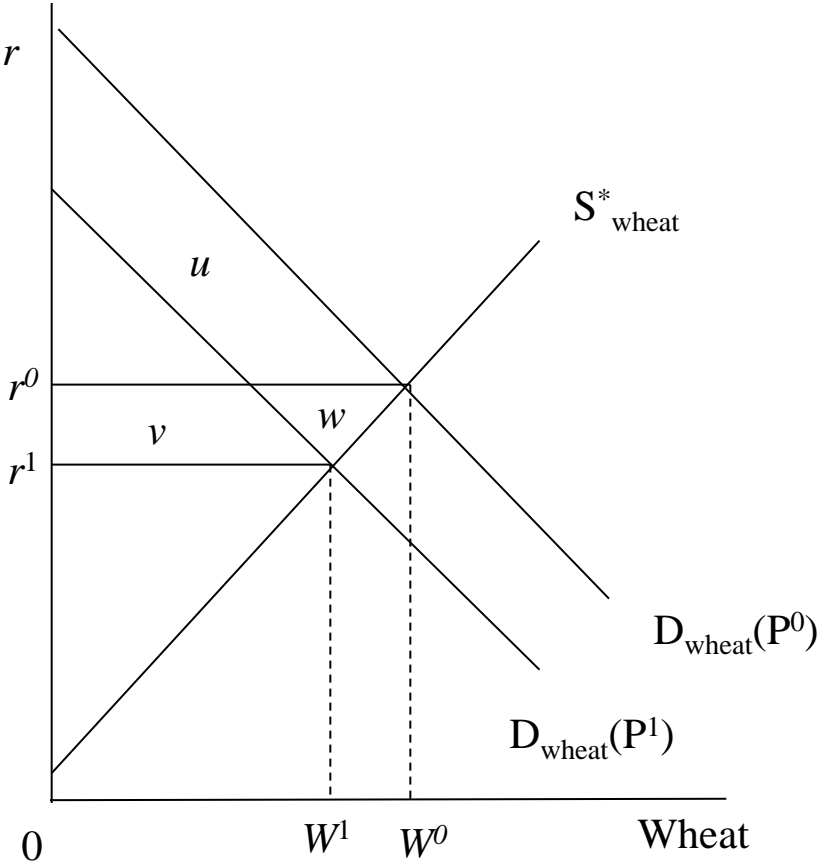
Government policy restricts the amount of flour sold to F^1 from free exchange amount F^0 . If the demand function in the upstream market (e.g., bread) is perfectly elastic then there is nothing to measure in that market and $a+b$ represents the entire loss to consumers. The same is true on the producer side if the supply function in the downstream market (say, flour) is perfectly elastic. Suppose that is not true of the downstream market.



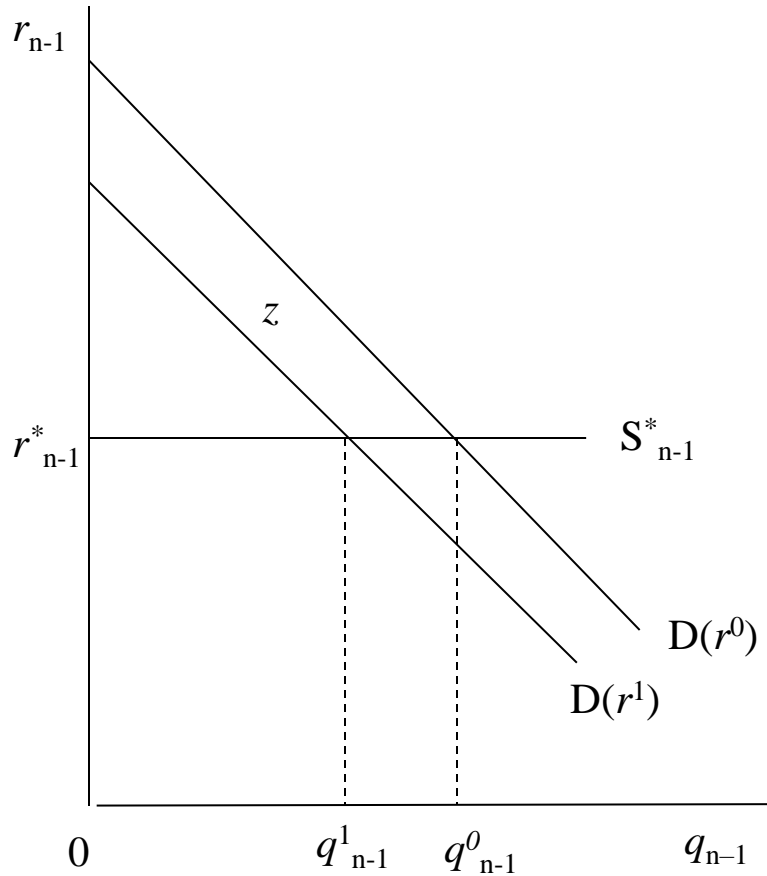
This is the downstream market for bread. Since the price bakers must pay for flour goes up, less flour is supplied and less bread is produced, but the price of bread does not change as a result. Note that the demand for flour is a derived demand by bread producers, whose producer surplus loss in the bread market ($\alpha+\beta$) can be measured by the lost consumer surplus in the flour market where it is $a+b = \alpha+\beta$.



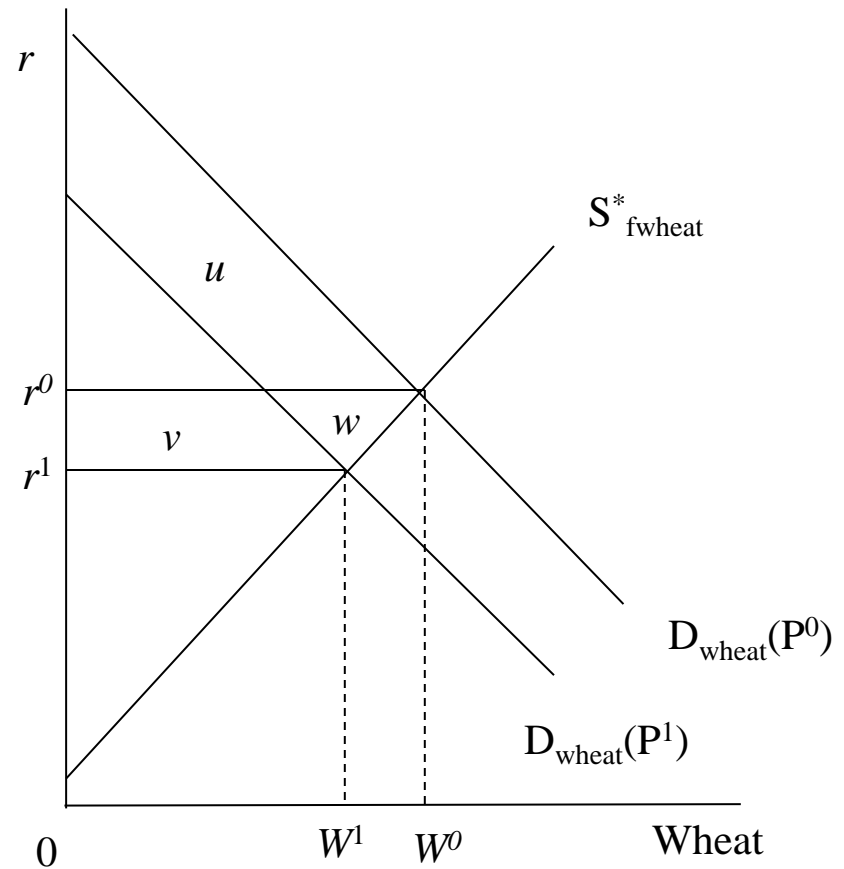
Derived demand for wheat comes from producers of flour, so the lost producer surplus in the flour market ($c+d$) can be measured by the lost consumer surplus in the wheat market where it is $u+w-v = c+d$. We still need to measure the lost producer surplus in the wheat market, which is $v+w$. The latter loss can also be measured in the downstream market.



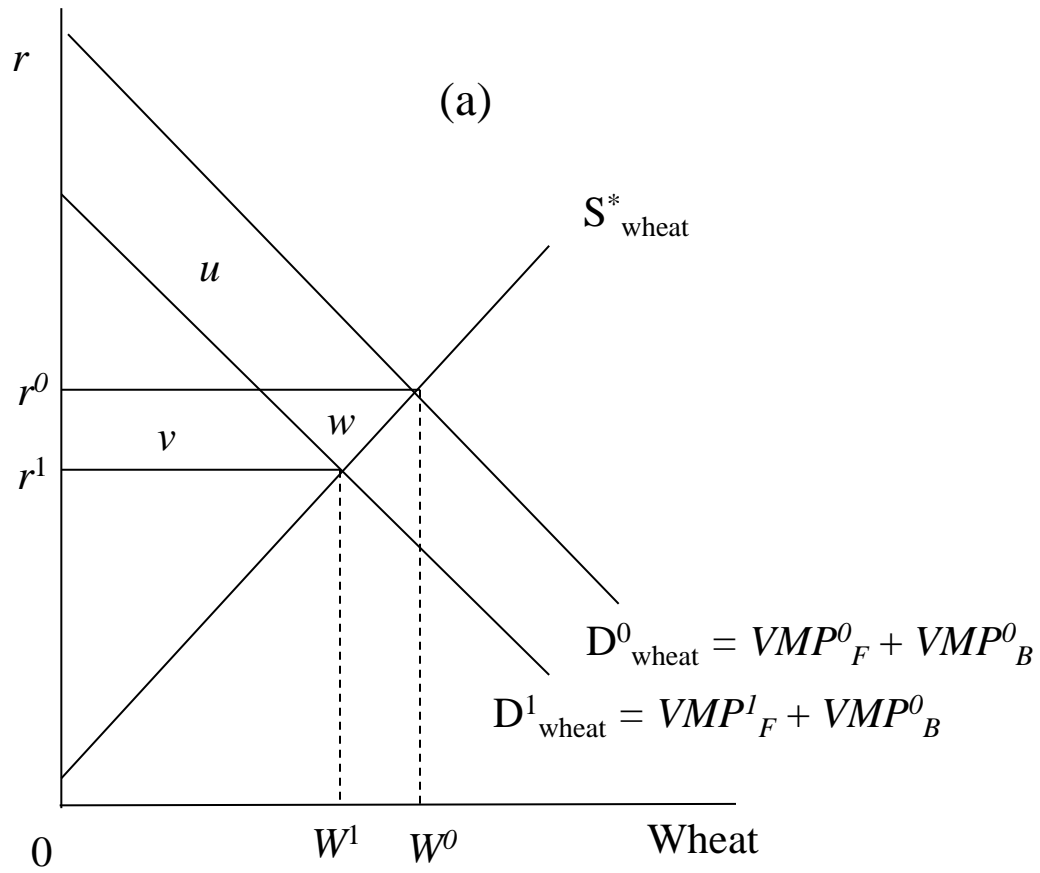
Derived demand for inputs into production of wheat comes from producers of wheat. In the wheat market, the producers lost a quasi-rent equal to $v+w$, which is identical to area z (lost consumer surplus) in the market for fertilizer, fuel and other inputs whose supply is assumed to be perfectly elastic. All welfare impacts are measurable in the wheat and flour markets.



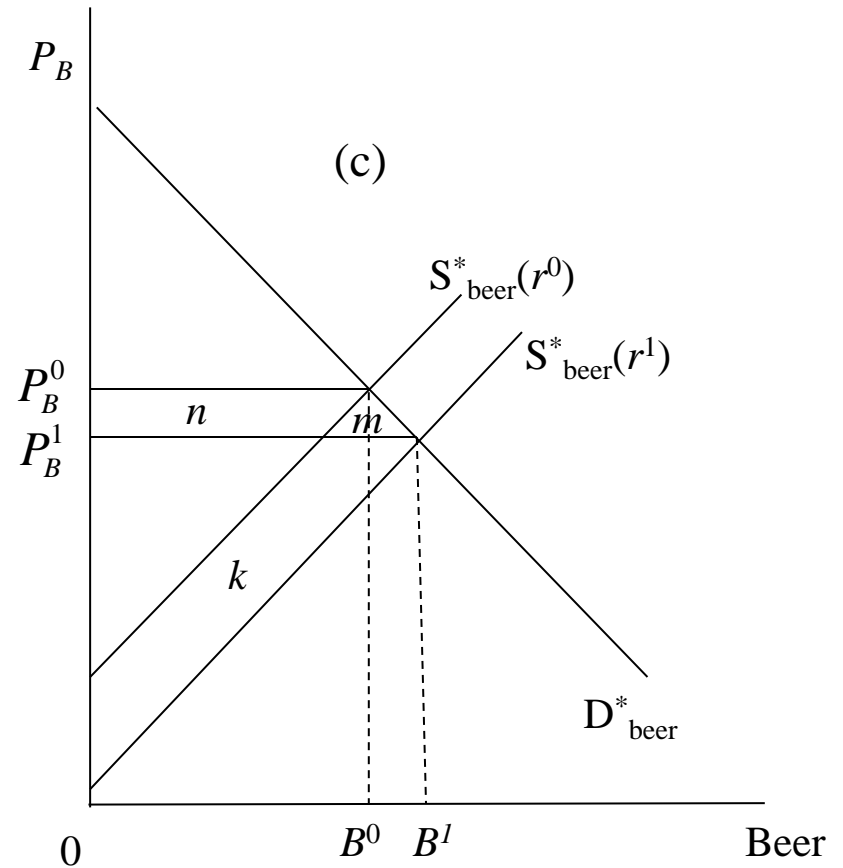
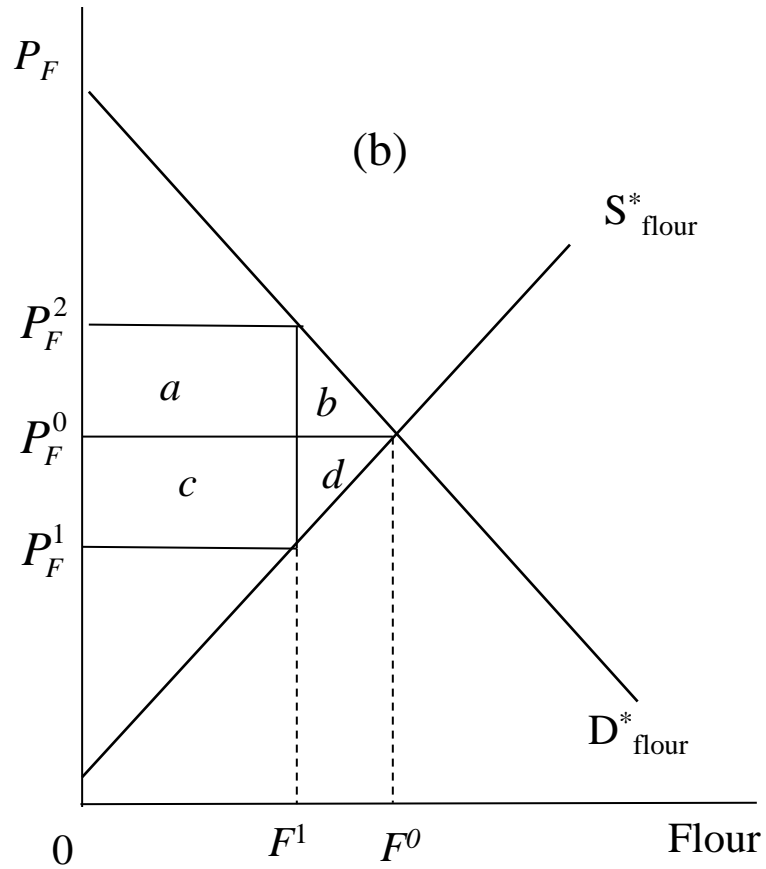
Market for fertilizer, fuel and other farm inputs to produce wheat



Intermediate good: wheat



Nothing to measure here



Joseph

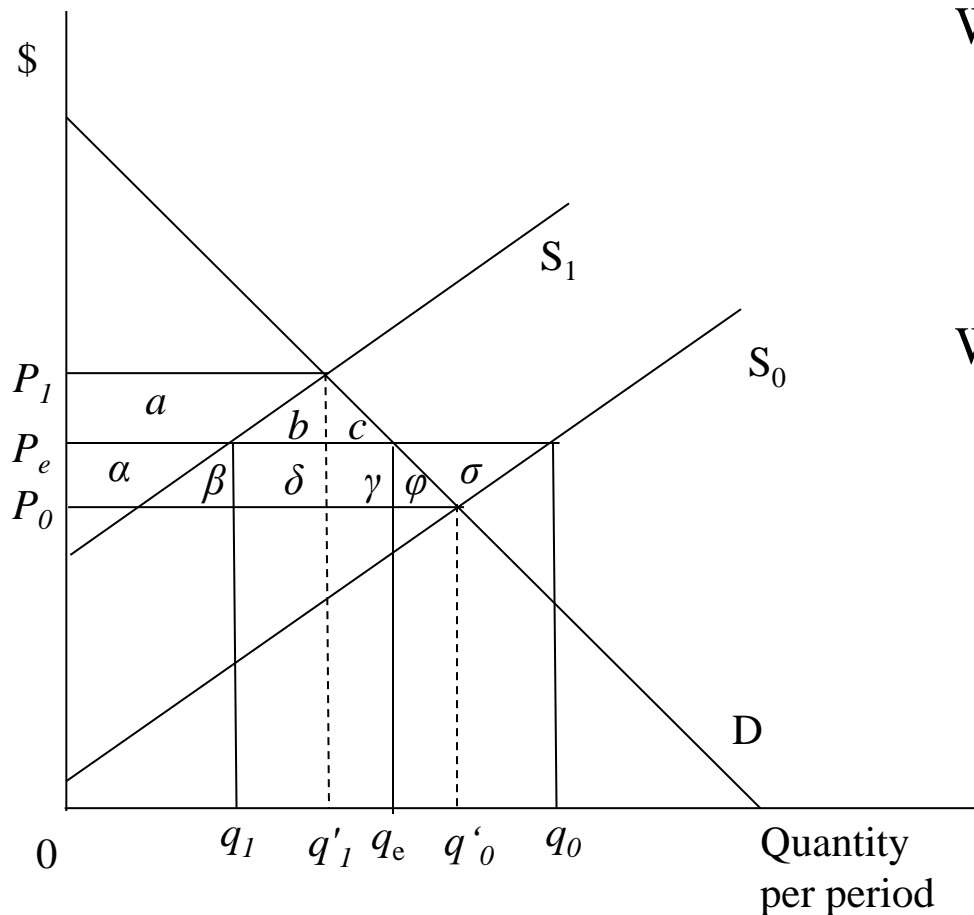
- First agricultural economist
- Econometric model or insight from God
- Buffer fund stabilization scheme
 - 7 years of plenty (low prices) – buy
 - 7 years of famine (high prices) – sell
- Both the U.S. and EU initially employed storage schemes in their agricultural policy programs

Stock-holding Buffer Fund Stabilization

- With supply uncertainty, the buffer stock/fund model (Massell 1970) provides gains to producers but consumers lose
- As shown below, producers' incomes are more variable with the stabilization fund
- Assume stable demand but stochastic supply that varies between S_0 and S_1 each with probability $\frac{1}{2}$.

Price Instability and Stock-holding Buffer Funds:

Producers face price P_e . Authority wishes to stabilize price at P_e . It buys $(q_0 - q_e)$ when S_0 occurs and sells $(q_e - q_1) = (q_0 - q_e)$ when S_1 occurs.



UNDER STABILIZATION:

When S_0 occurs:

- consumers lose $\alpha + \beta + \delta + \gamma + \phi$
- producers gain $\alpha + \beta + \delta + \gamma + \phi + \sigma$
- Net gain: $+\sigma$

When S_1 occurs:

- consumers gain $a + b + c$
- producers lose a
- Net gain: $b + c$

The stock-holding buffer fund leads to an average annual net gain of $\frac{1}{2}(b + c + \sigma)$ minus administrative and storage costs

Income stabilization with buffer funds

- Price stabilization can lead to increased income variability in some cases
- With supply instability, we have:

$$2 p_e q_e > p_0 q'_0 + p_1 q'_1$$

- But incomes are more variable:

$$\text{With } S_0: p_e q_0 > p_0 q'_0$$

$$\text{With } S_1: p_e q_1 < p_1 q'_1$$

Notice that you now have greater income variability

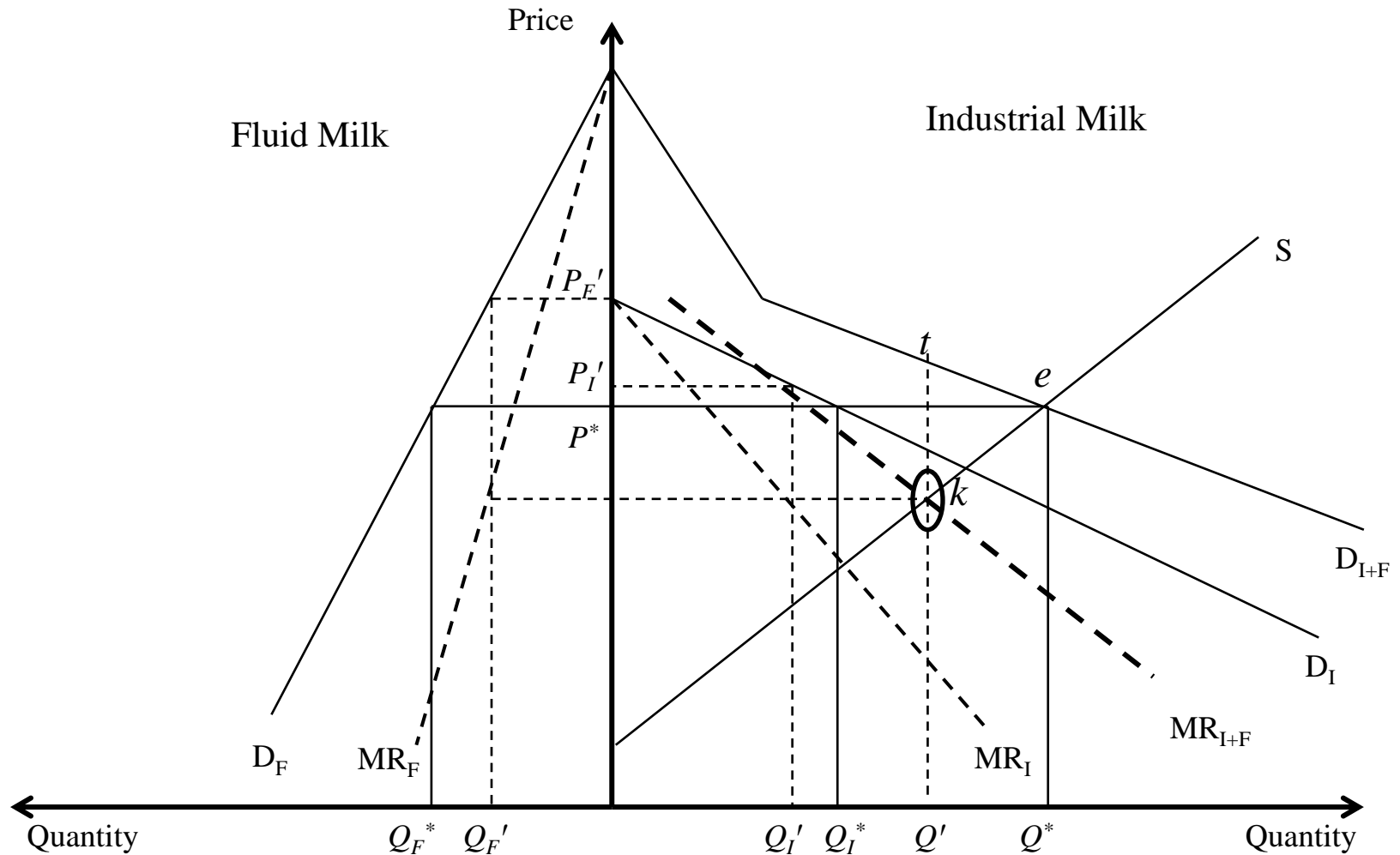
Income stabilization with buffer funds (cont)

- With government storage (under supply uncertainty), producers are still better off even though income variability has increased
- In a model of demand uncertainty due to Oi (1961) and Waugh (1944), producers will prefer uncertainty to price stabilization.
 - Left as an exercise for students

Common Market Organizations

- 1933 & 1938 U.S. Farm Bills and the Council of Stresa (1958) focused on the creation of commodity organizations that would be permitted economic practices prohibited under anti-trust legislation, such as monopoly pricing and discriminatory pricing.

Price Discrimination

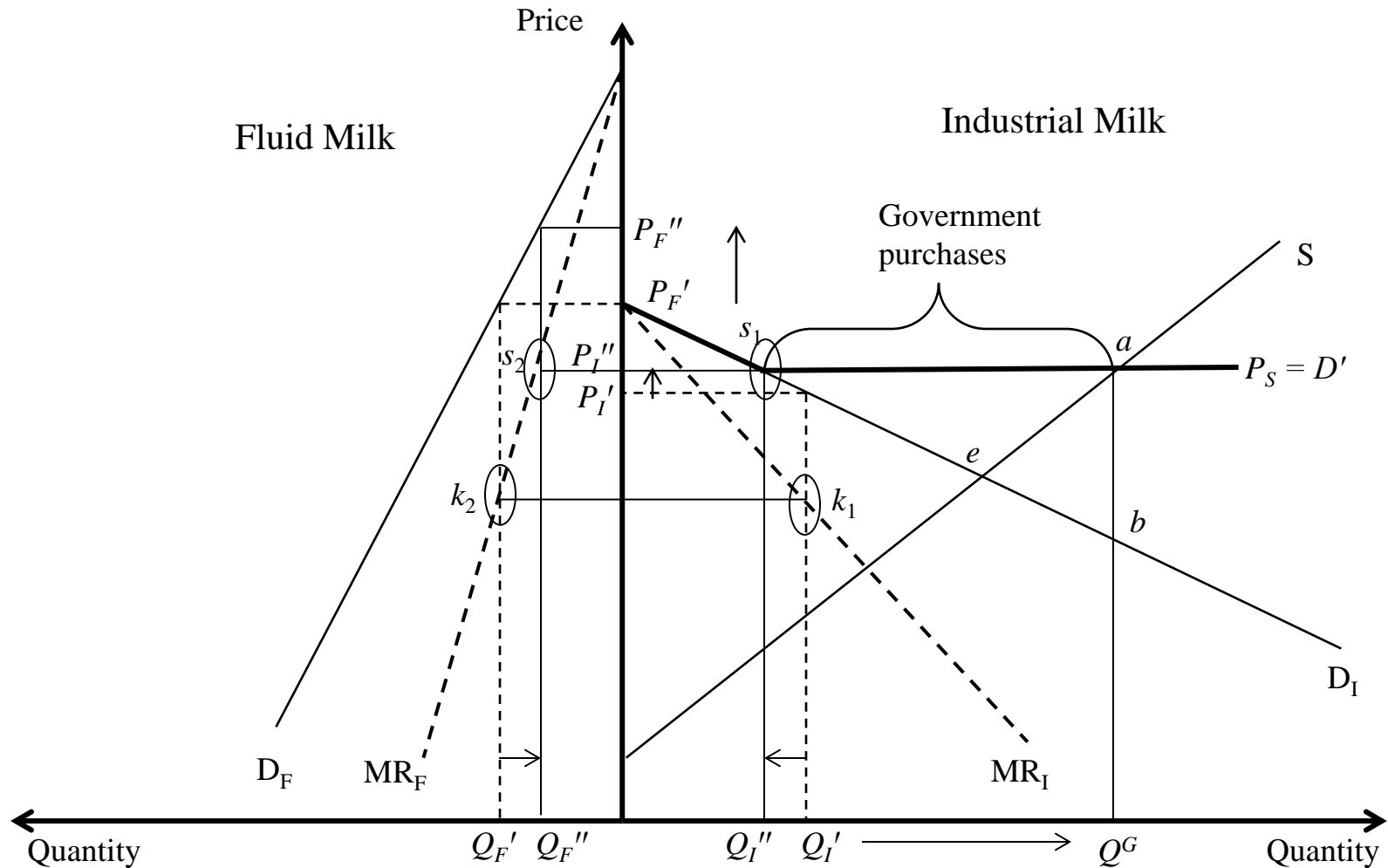


With price discrimination:

Output: $Q' = Q_F' + Q_I'$ at prices P_F' and P_I' in the fluid and industrial milk markets, respectively. The blended price will be a weighted price of P_F' and P_I' , and will exceed P^*

Effect of Government Purchase

During the 1980s, government bought 5%-30% of U.S. production as butter and milk powder



Demand in each market is reduced as price goes up, and the blended price goes up; the government purchases industrial milk (fresh milk does not keep). The initial purchase raises the blended price leading to an output response, leading the government to purchase more to maintain price. The final result is that the blended price (support price) equals marginal cost of milk production, with government holding more than originally intended. During the 1990s, market price > support price as support price fell and markets were better.

U.S. Policy: Background

- Early agricultural policy
 - 1862: Homestead Act
 - 1862 Morrill Act
 - Created the Land Grant colleges (given 30,000 ac federal land).
 - 1890 Morrill Act to bring in the Confederate states
 - 1887 Hatch Act created Agricultural Experiment Stations
 - 1914 Smith-Lever Act created cooperative extension
- 1st farm bill passed in 1933 as part of Roosevelt's New Deal.
- Every 5-6 years the U.S. passes a new farm bill

Background (cont)

- The naming of the various Farm Bills is interesting and suggestive of the way politicians are thinking. Here are some examples:
 - 1933 Agricultural Adjustment Act
 - Created Commodity Credit Corporation (CCC) to purchase basic agricultural commodities if prices too low, and sell them when prices were higher
 - 1937 Agricultural Marketing Agreement (AMA) Act
 - **1949 Agricultural Act/Farm Bill** (default if no new Farm legislation enacted)
 - 1996: Federal Agriculture Improvement and Reform (FAIR) Act
 - 2002 Food Security and Rural Investment (FSRI) Act
 - 2008 Food, Conservation, and Energy (FCE) Act (similar to FSRI Act)
- Along with creation of the central banking system, agricultural acts sought to augment human capital in agriculture (research, education) and facilitate access to credit
- After 1933, (1) commodity price stabilization, (2) price support and (3) conservation characterized U.S. farm programs

Background (cont)

- Problems with the various farm bills:
 - Distortionary impact on food prices
 - Distortionary impact on exports and international trade
 - Negative impacts on the environment
 - Red initiatives
 - Green initiatives
 - Over production and decoupling question
- Major issue is the effect of U.S. and EU farm policy on farm policy in other countries
 - EU policy on GMOs
 - U.S. and EU ‘dumping’ lowers prices faced by producers in other countries, but subsidizes consumption in other countries
 - Biofuel distortions (2008 Farm Bill included energy subsidies)

Primary focus of 1933-1970 Farm Bills

1. Rural poverty
2. Soil conservation – encourage shift from soil-depleting (erosive) crops to legumes and grasses
3. Crop insurance
4. Farm credit

NOTE: The Agricultural Act (1949) is permanent. Every Act since then has included a sunset clause. The 1949 Act is the default if Congress cannot agree on a new farm bill. The 1949 Act would result in huge payments to dairy producers – the ‘dairy cliff’.

Highlights

- **1933 Farm Bill:** created Commodity Credit Corporation and government purchase (loan rate), and policies to reduce output
- **1937 Farm Bill** created marketing orders
- **1949 Farm Bill** (Default)
- **1965 Farm Bill** required farmers to set-aside a proportion of cropland to be eligible for subsidies
 - What type of land was set aside? Grasslands (permanent pasture), perennial crops, forests
 - Referred to as CROSS COMPLIANCE

Highlights (cont)

1970 Farm Bill (Agricultural Adjustment Act) led to:

1. **Target Price (TP):** price for agricultural commodities established by law as the mechanism to support farm incomes, although previous farm bills included a support price
2. **Loan rate (LR):** price floor set in agricultural policy
 - New idea in the 1970 legislation
 - Non-recourse loans: farmers take out a loan on grain at the LR price
 - If actual price $>$ LR, grain sold on the market and loan repaid
 - If actual price $<$ LR, grain delivered to the CCC
 - Non-recourse loan because only delivery, not repayment of the loan was required
3. **Deficiency payment (DP):** Direct payment to farmers based on historical acreage and yields.

1970 Bill still led to overproduction:

- 1981-1986: 3 billion bushels of wheat went into the CCC loan program
- 1981-1986: Payments exceeded \$6 billion

Highlights (cont)

1985 Farm Bill (Food Security Act) introduced

1. *Export Enhancement Program (EEP)*

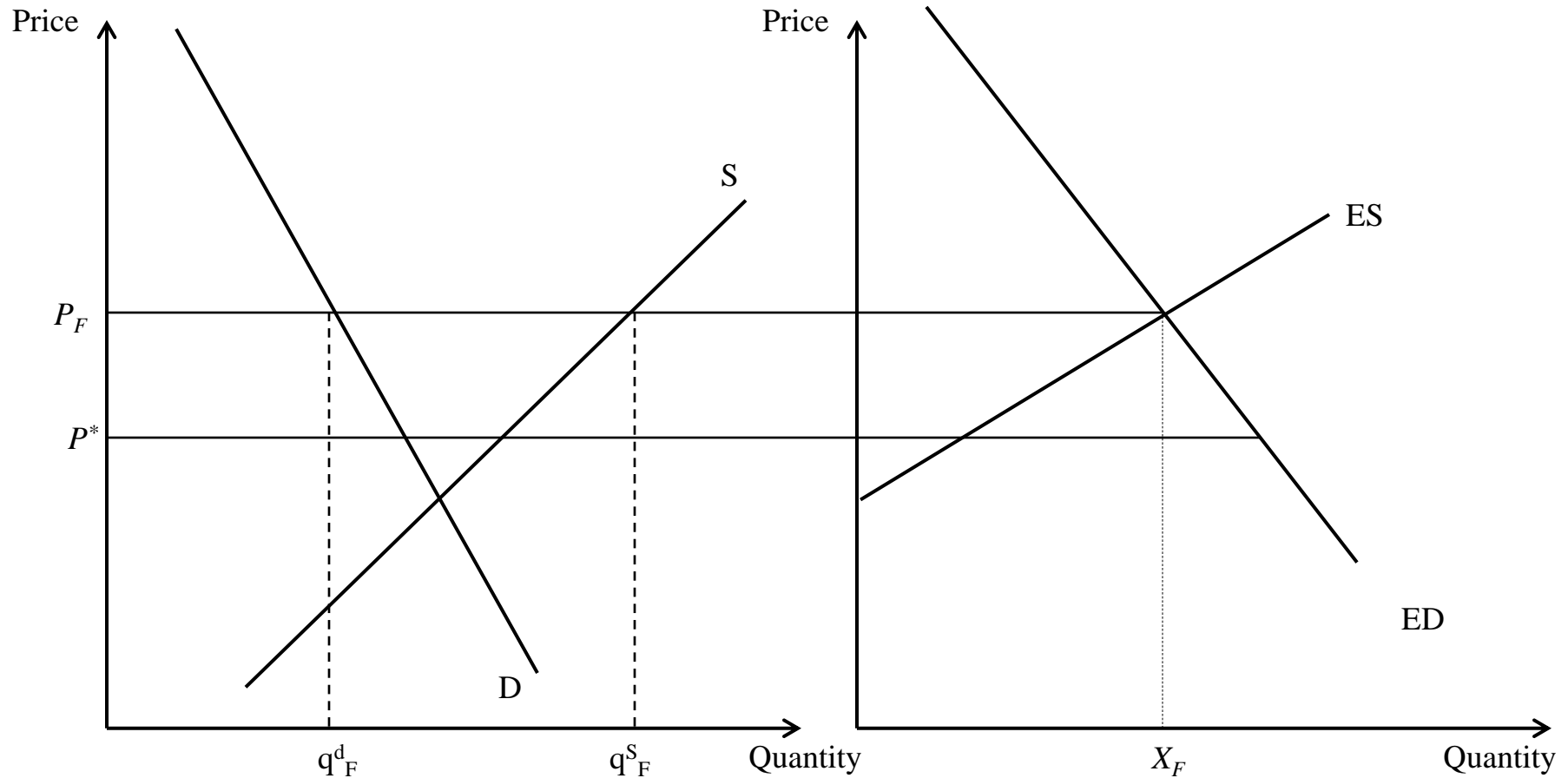
- In place from 1985-1995
- Designed to match subsidized EU prices
- Designed to reduce accumulating U.S. grain stocks
- Wheat most important crop to receive EEP benefits
 - 1994: \$1.15 billion payment (highest under EEP)

2. *PIK program*

- Worked via the set aside provision

(1) Export Enhancement Program

P_F is the free market price. A company applies to export grain at price P^* . Cost to U.S. Treasury equals EEP bonus \times quantity shipped



Program expands exports from X_F to X_E and increases domestic price to P_E from P_F while world price falls from P_F to P^* . The EEP bonus = $P_E - P^*$ (paid by U.S. taxpayers.)

U.S. taxpayers pay $a+b+c+d+e+f+g+x+y+z$

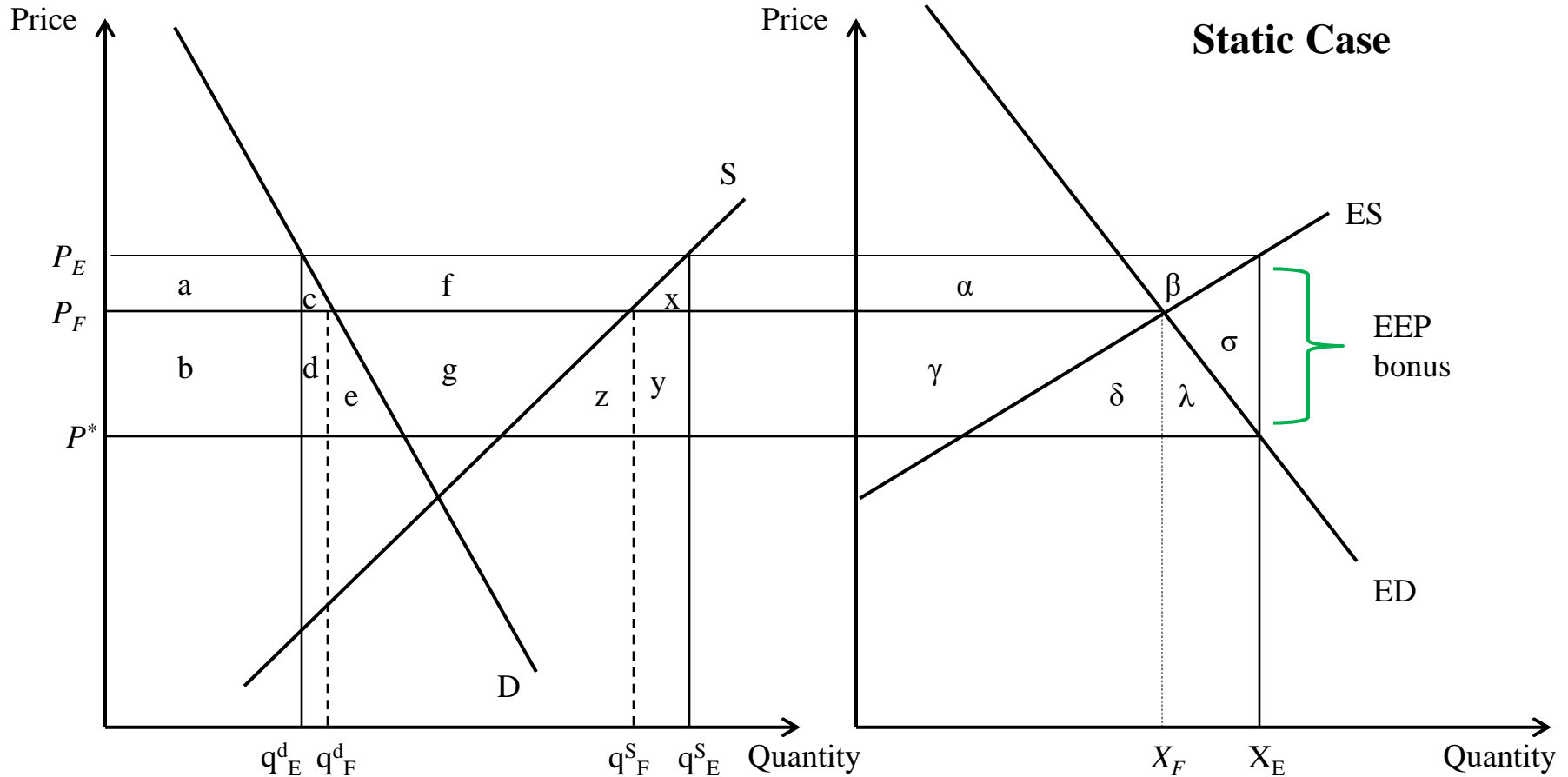
U.S. consumers lose $a+c$

Foreign consumers gain, producers lose

U.S. producers gain $a+c+f$

Net U.S. loss = $(c+d+e) + (x+y+z)$

Net gain to foreign countries = $\gamma + \delta + \lambda$



Export Enhancement Program: Dynamic Effects

- EEP reduced world price so much that U.S. imported barley at one point as its US price was so high relative to world price
- EEP actually encouraged more production.
 - Greater production led to additional changes in subsequent farm bills and efforts to reduce the loan rate and decouple production from prices
- Two immediate actions to address over production
 - Loan rate reduced in 1986:
 - This reduced world price of wheat by \approx \$1/bu
 - BUT deficiency payments to farmers remained.

(2) Payment-In-Kind (PIK)

- PIK allowed farmers to remove an additional 10-20% of their acreage in return for commodity credits – 95% for wheat, 80% for other commodities
 - Farmer would get a commodity credit with CCC for 95% (80%) of crops that would otherwise have been grown (credit for crops not grown)
 - certificates for the commodity
 - Alternatively, a farmer would bid for the % of in-kind payment to retire the entire farm
- PIK program identified 231 million acres as eligible and ended up retiring (removing from production) 188 million acres
- Wheat and corn production each declined by 25%
- PIK met two goals:
 - (1) Reduced Treasury costs of agricultural programs in late 1980s

1996 Farm Bill: Federal Agricultural Improvement and Reform (FAIR) Act

- Target price removed in an effort to reduce production by decoupling payments from output. Loan rate kept but farmer sells at market price and receives difference as payment → no storage
- Acreage set-aside programs removed
- Introduced Agricultural Market Transition Act Payments
 - Seven declining annual market transition payments that replaced the deficiency payments
 - Based on historical plantings and yields
 - Payments NOT tied to market prices or planting decisions → decoupled. This resulted in:
 - 1) a more market-oriented agricultural policy
 - 2) policy more in line with WTO-mandated agricultural policies

2002 Farm Bill: Farm Security and Rural Investment Act

- Reintroduced target prices
 - Direct deficiency payments from 1996 continued
 - Changes to direct payments:
 - New deficiency payment paid on only 85% of base acres at historical yields
 - historical yields NOT to change over time – i.e., fixed!
 - unlike deficiency payment, producer does not need to plant crop for which payment is received.
 - Payment based on historical crop pattern.
- **optimal inputs used in agriculture no longer depend on the target price so TP does not affect supply**

2002 Farm Bill (cont)

- Introduced the **countercyclical payments (CCP)** program
 - provided payments if effective price of commodity was below the target price
 - based on historical prices and yields
- Effective price: Greater of (1) Loan Rate or (2) Season average price
- There is a payout under CCP if:
effective price + direct payment rate < target price

2008 Farm Bill

Food, Conservation and Energy (FCE)

Act

Identical to 2002 Farm Bill (FSRI) except:

1. Lower limit established on total program payouts made to a farm or individual → family farm divided among family members
2. Extended to include some speciality crops (peas & lentils)
3. Again target prices and loan rates are spelled out
4. Introduced **Average Crop Revenue Election** (ACRE) Program: Farmers can choose Option A or Option B:
 - **Option A:** (1) countercyclical payments, (2) 20% of their direct payments and (3) 30% reduction in their marketing loan rates

Congressional Budget Office (2012) Estimated Annual Average Expenditures Under the Provisions of the 2008 Farm Bill: 2013-2017

Expenditure Category	CBO Annual Average Expenditure Estimates (\$ billions)
Commodity Programs (including Direct Payments, Countercyclical Payments, Milk Income Loss Contract Outlays, Loan Deficiency Payments, and ACRE Payments)	\$6.29
Conservation Programs (including Conservation Reserve, Wetlands Reserve and other Conservation Programs)	\$6.41
Nutrition Programs (including SNAP and School Meals Expenditures)	\$77.11
Federal Crop Insurance Programs	\$9.09
Other Programs (excluding credit programs)	\$0.55
TOTAL OUTLAYS*	\$99.28

* The categories do not sum to the total because CBO estimates that various USDA credit programs will, on average, generate about \$266 million a year in net income.

2014 Farm Bill

Agriculture Act of 2014

- Passed: February 4, 2014 by U.S. Senate
- Benefits:
 - Food stamps for the poor and
 - Agricultural support for farmers (often resulting in large crop subsidies for the rich)
- **Total cost: \$965 billion over 10 years**
- **Share of 2014 farm bill spending which has nothing to do with farming: 80%**

The Economist, 8-14 February, 2014, pp.27-28

2014 Farm Bill (cont)

- New farm bill passed in time for mid-term elections in November 2014.
- Senate members probably voted ‘yes’ to avoid the “dairy cliff”:
 - If a new bill had not been passed, the 1949 Farm Bill would become the default piece of legislation
 - 1949 Farm Bill would oblige government to buy dairy products at twice the going rate.
- Food Stamps included in the 1977 Farm Bill (although Food Stamp Act, 1964) to get urban support for agriculture
- House Republicans want to reduce food stamp payments because they believe welfare payments discourage work

2014 Farm Bill (cont)

- Food stamp use has risen dramatically since 2000
- Numbers of people on food stamp program:
 - 2000: 17 million
 - 2007: 26 million
 - 2013: 48 million
- Increase in food stamp recipients caused by:
 1. weak economy
 2. demographic change
 3. effort to make more people eligible
- Program is projected to shrink as growth revives.

Problems of food stamp program

- High administrative costs
- Open to corruption
- 126 anti-poverty programmes that overlap and are confusing

Problems of agricultural part of farm bill

- Other businesses may question why farmers are treated differently. Lots of businesses have good and bad years.
- Bill moves away from direct payments to insurance, with farmers paid if crops fail and/or prices fall too far. Problems:
 - Insurance locks in high prices when farming is profitable
 - Payouts may be much higher than the crops would have been worth.
- Insurance companies make money off the farm bill by providing policies. Could lead to corruption and higher costs to tax payers.
- Montana State University study found for every \$1 spent on farmers, \$1.44 went to insurance companies.
- Crop insurance payments are skewed towards wealthier farmers, though new bill tries to cap amount any one farmer can receive.

Problems combining food stamps and agricultural support

- Has created products that are economically not supported in the rest of the world (e.g., making sugar from corn)
- WTO has penalized the U.S. for keeping cotton subsidies in place. Must pay Brazilian farmers \$147 million per year as compensation.

Main Provisions

- Income caps on farm subsidies
- A price support program for dairy farmers
- Ends direct payment subsidies, which paid farmers whether or not they actually grew any crops
 - This subsidy had cost \$5 billion a year
- Removes federal restrictions aimed at growing industrial hemp and allows any states that have legalized its manufacturing to set up research programs to study the benefits of cultivating it

Budget/Cost Breakdown

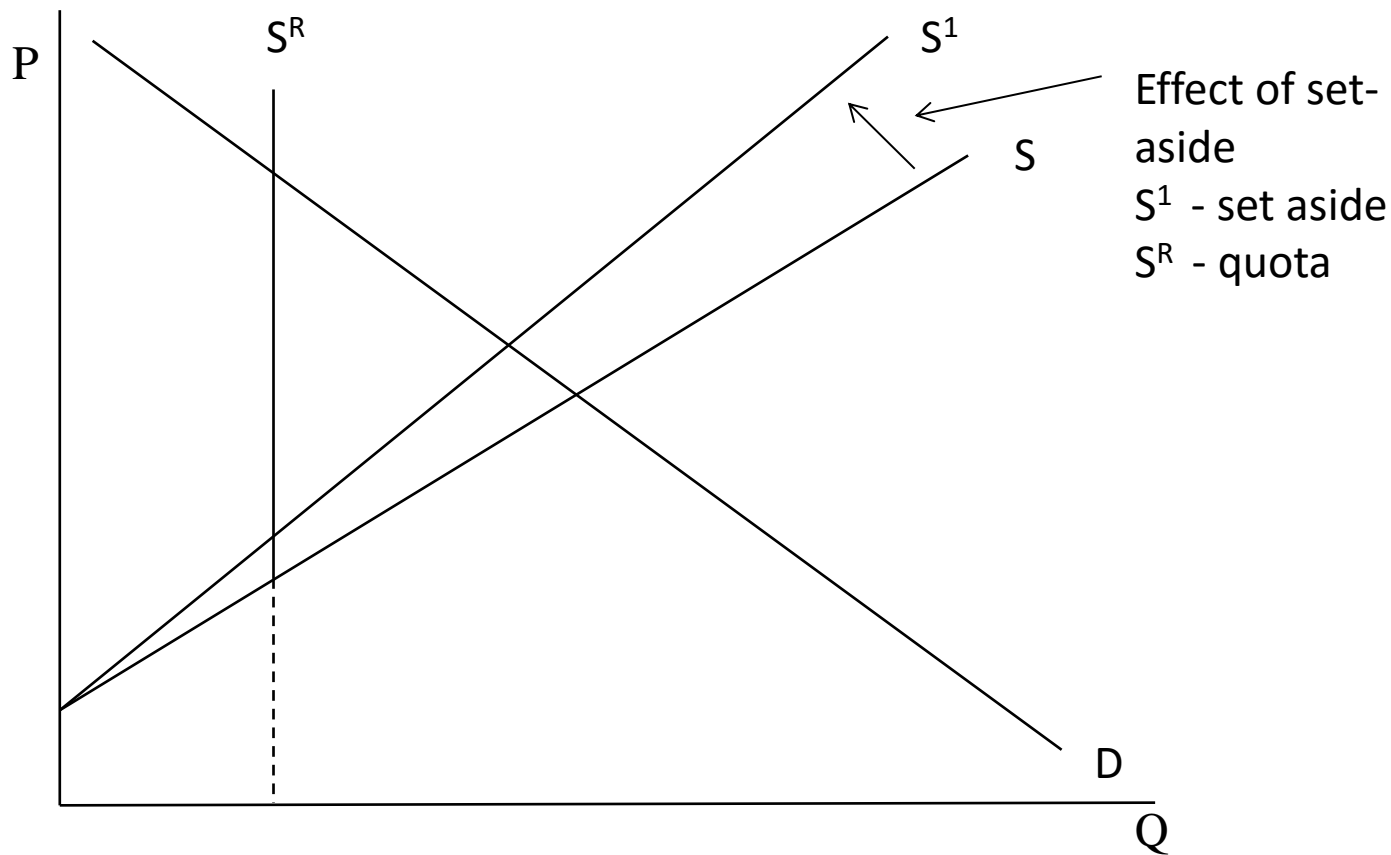
- Food stamps and nutrition: \$756.0 billion
- Crop insurance: \$89.8 billion
- Conservation: \$56.0 billion
- Commodity programs: \$44.4 billion
- Everything else: \$8.2 billion

Interesting Facts

- **Famous recipients of farm subsidies:**
 - Bruce Springsteen (rock star)
 - Jimmy Carter (former U.S. President)
 - David Rockefeller (billionaire entrepreneur)
- **Share of subsidies received by largest 10% of farm enterprises: 75%**
- In 2013, 10 members of the House who voted for the bill accepted donations from agriculture lobbyists amounting to almost the same dollars as some farmers received.

Perspective After 75 Years

- Price floor in place since 1933. Three mechanisms:
 - 1) production quotas (1933 Farm Act)
 - 2) loan rates with set asides (1965)
 - 3) loan deficiency payments (1990)
- Supported basic commodities: corn, cotton, soybeans, wheat
- What the set-aside provision does is shift the supply curve to the left (pivot the supply curve) as indicated in the next slide. Now, when you introduce the loan rate, less is produced than



- Non-recourse loan
 → if market price > loan rate + interest charges, farmer sells grain in market;
 otherwise, the CCC takes over the commodity
- Deficiency payment: = (market price – loan rate) × quantity

Now Examine Some Specific Programs

- Conservation Reserve Program (CRP), 1985
- Marketing Agreements/Orders (again), 1937
- U.S. Dairy Program,
- U.S. Sugar Program
- Peanut Program
- Tobacco Program
- Organic farming (micro loans)

Conservation Reserve Program (CRP)

- Established in 1985 Food Security Act
 - provision in the 1985 Food Bill to retire highly erodible land for a period of 10-15 years
- Objectives:
 1. reduce soil erosion
 2. reduce output to increase price
 3. bolster net farm income
- To protect rural communities no more than 25% of land in any county could be removed.
- Per acre payment with \$50,000 limit per person

CRP (cont)

- 1991: 38 million acres in CRP
- 2000: 34 million acres in CRP
- 2008: 32 million acres in CRP

- As a result of the 1985 Food Security Act, the majority of land in CRP came from the Great Plains. Why?
- Subsequently, to increase CRP lands in the mid West, the 1990 Farm Bill (Food, Agriculture, Conservation & Trade Act) emphasized water quality in determining CRP eligibility
- 1996 Farm Bill (FAIR Act) included wildlife habitat conservation as a criterion
 - By converting row crops to grasslands soil erosion is reduced and wildlife habitat enhanced

U.S. Peanut Program

- Quota used to regulate production for U.S. edible peanut market
 - mid 1990s → quota exceeds domestic demand
- Quota buyout program compensated farmers for the value of their peanut quota based on 2001 quota ownership
 - \$220/ton offered in annual installments (2002 – 2006) or lump-sum in the fiscal year chosen by the farmer
 - Done in 2002 to comply with NAFTA and WTO agreements

U.S. Tobacco Program

- Program started in 1938 to stabilize market and ensure “Fair” prices
- Quota and price supports
 - annual acreage-based quota on basis of historical production
 - Converted over time from acreage-based to pound-based marketing quota
- Quota based on:
 1. Purchasing intentions of domestic tobacco manufacturers
 2. 3-year average of exports
 3. Stock adjustment

U.S. Tobacco Program (cont)

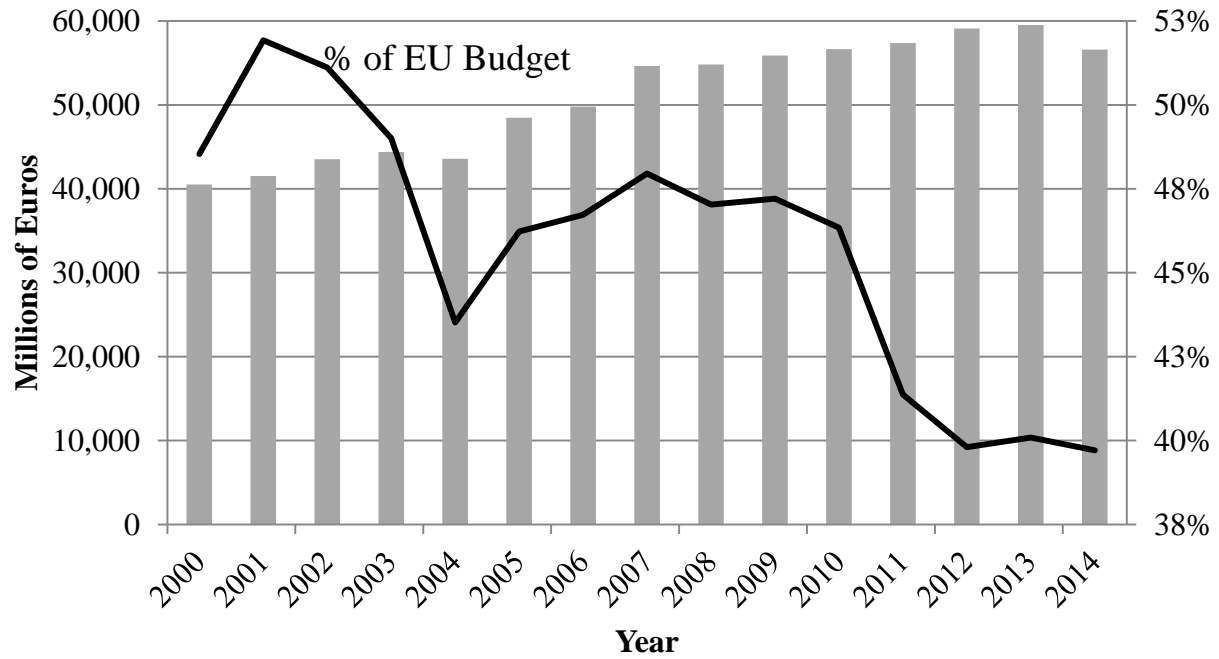
- Imports and direct manufacturer-farmer contracts undermined the quota system. Direct contracts by-passed the auction system.
- 2004: Fair and Equitable Tobacco Reform Act (tobacco buyout) as part of the American Job Creation Act
 1. Terminated federal tobacco price support and supply control programs
 2. Payments to quota owners and active growers to eliminate quota asset
 3. Orderly disposal of CCC holdings of tobacco stocks
- Cost of buyout program \$10.14 billion paid for by taxes on companies and tobacco imports
- Growers now completely free to produce and sell tobacco in a free market with no government support

Summary

- Market prices have generally exceeded the loan rate since the early 2000s and, in corn and wheat, exceeded the target price
 - In 2008, wheat loan rate was \$2.94/bu and target price was \$4.17/bu
- Academic economists do NOT generally support the agricultural programs used by the U.S. and other countries
 - transfer payments have been large
 - programs lead to inefficiency
 - distorted world prices, trade flows and the ability to conclude WTO negotiations

Summary (cont)

- Agricultural Programs are one of two kinds:
 1. political-economic-seeking transfers (PESTS)
 2. political-economic-resource transfers (PERTS)
- PESTS lead to net welfare losses (most programs)
- However, while PERTS are also a form of income transfer, they might in some instances enhance welfare
 - Crop insurance might be an example, and we study it in other lectures



European Union Budget, 2014

