

PubPol/Econ 541

Class 13

Multi-Market Analysis

by

Alan V. Deardorff
University of Michigan
2022

Announcement

- Quiz:

Q3	Q4	Q5	Q6
6.78	8.03	8.62	7.20
6.5	8	9	8
9.5	10	10	9.5
4	5.5	6	3
1.97	1.24	1.21	1.86

- No quiz this week

Announcement

- **Next class: Visit by Ira Shapiro**
 - General Counsel in the Office of the U.S. Trade Representative during the Clinton administration
 - Slides posted and required
 - Come prepared with questions to ask Mr Shapiro

Pause for News

Outline

- Large country tariff
- Differentiated-Product Import, Small Country
- Imported Input to Production of Final Good
- Tariff on Import from One Country but Not Another

Recall: Small-Country Tariff

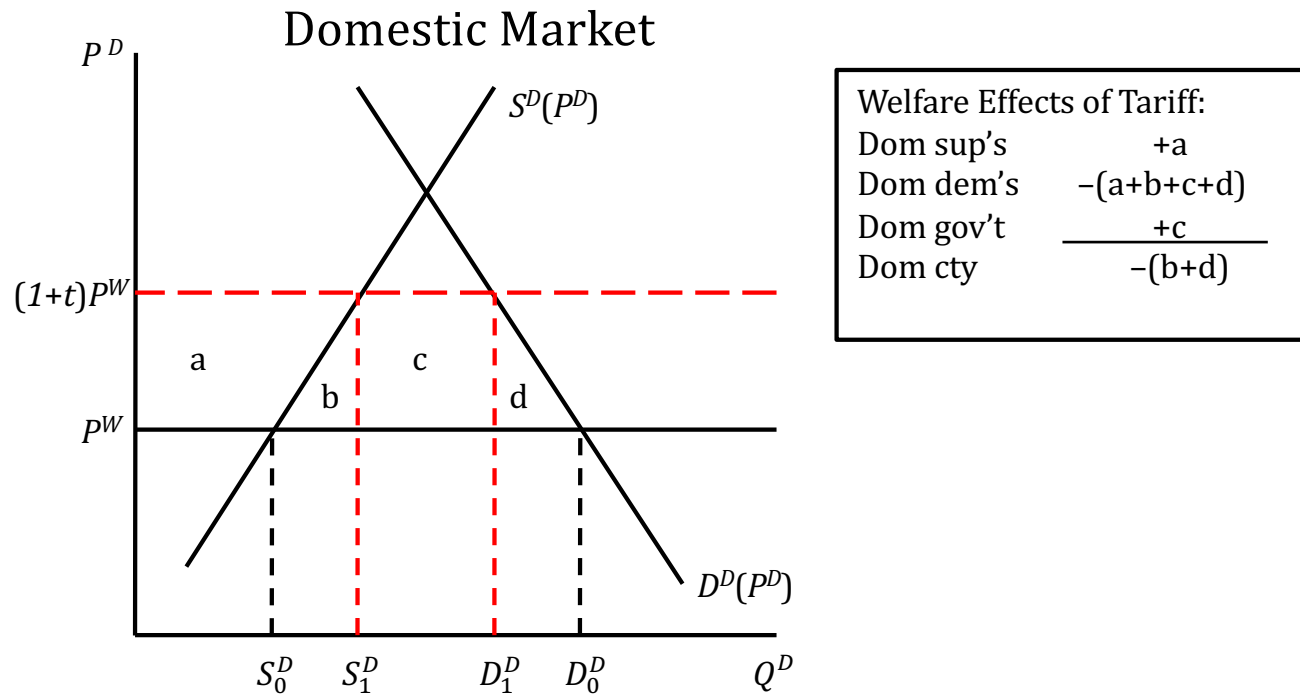


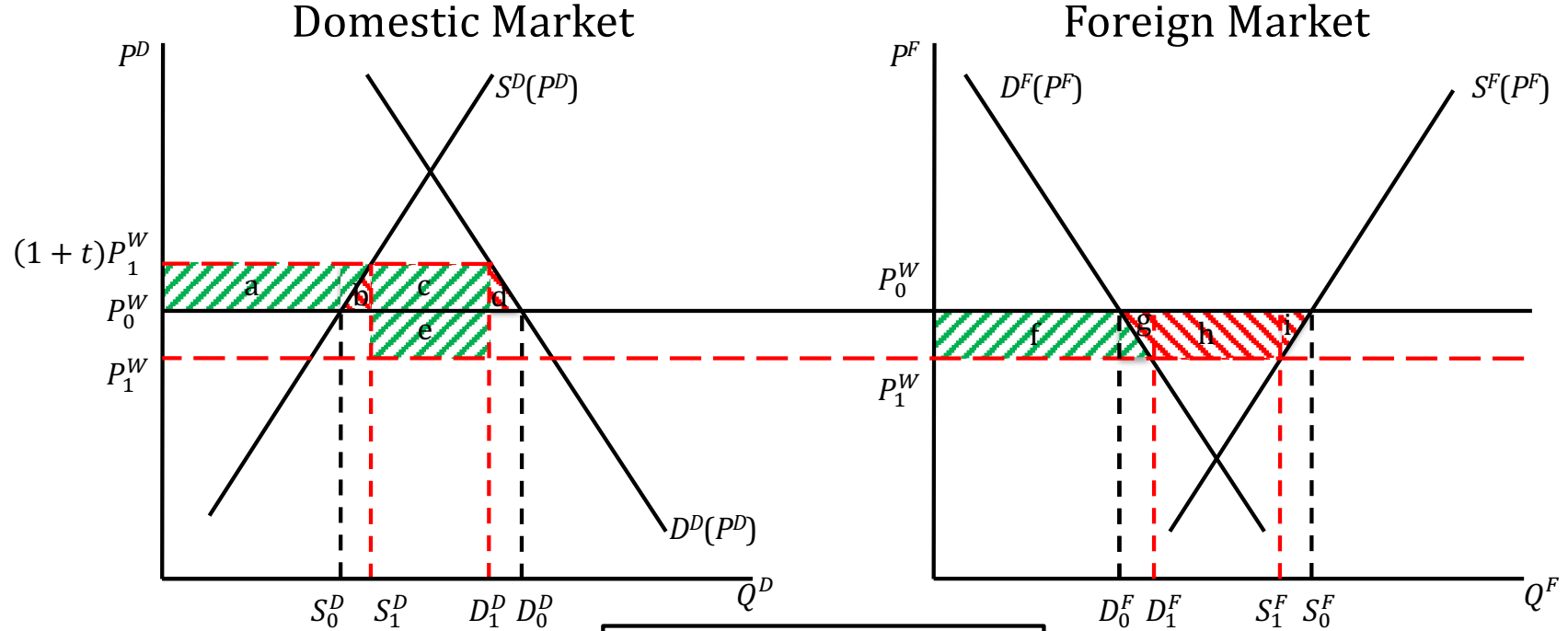
Figure 1

Tariff in a Small Country on a Homogeneous Good

Outline

- Large country tariff
- Differentiated-Product Import, Small Country
- Import Input to Production of Final Good
- Tariff on Imports from One Country but Not Another

Recall: Large-Country Tariff



This was a multi-market analysis

Welfare Effects of Tariff:	
Dom sup's	+a
Dom dem's	-(a+b+c+d)
Dom gov't	$\frac{+(c+e)}{}$
Dom cty	+e-(b+d)
For sup's	-(f+g+h+i)
For dem's	+f
For gov't	$\frac{0}{}$
For cty	-(g+h+i)
World	-(b+d+g+i)

Figure 2

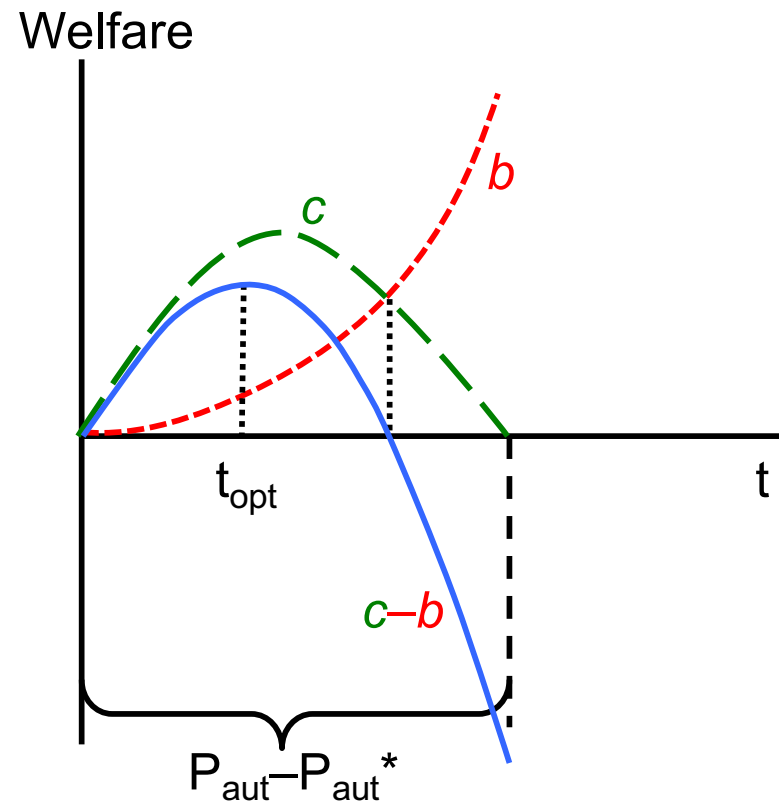
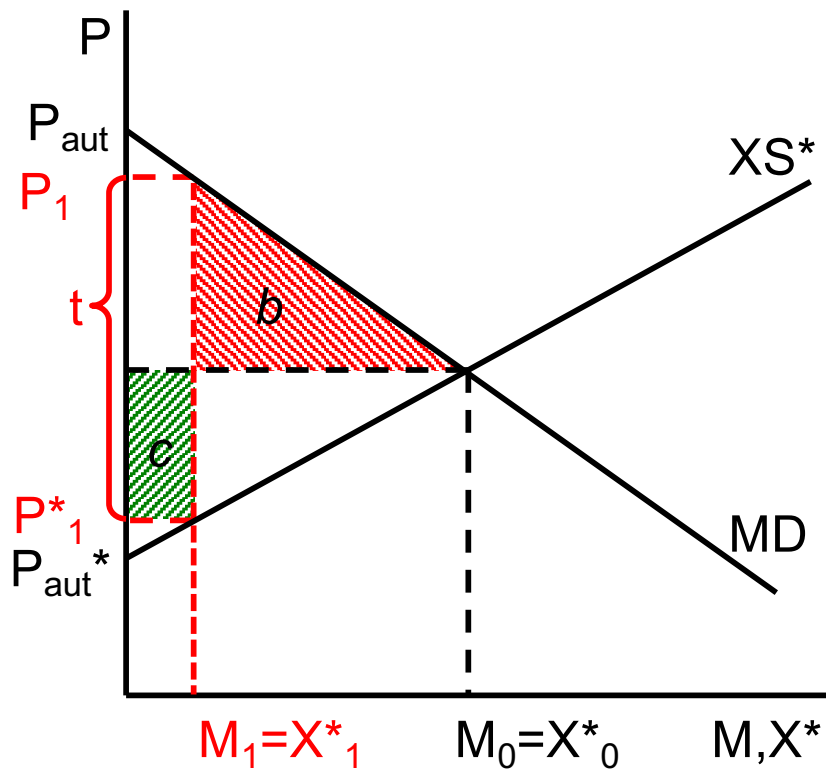
Tariff in a Large Country ("Domestic") on a Homogeneous Good

Pause for Discussion

Questions

- In the case of a large-country tariff, what would a graph of the welfare of the tariff-levying country look like as a function of the size of the tariff?

From Class 4, Sept 13:



Questions

- In the case of a large-country tariff, what would a graph of the welfare of the tariff-levying country look like as a function of the size of the tariff?
- With an unchanged tariff, what will happen to prices in the two countries if there is a right-ward shift of
 - Home supply
 - Home demand
 - Foreign supply
 - Foreign demand

Outline

- Large country tariff
- **Differentiated-Product Import, Small Country**
- Import Input to Production of Final Good
- Tariff on Imports from One Country but Not Another

Differentiated-Product Import, Small Country

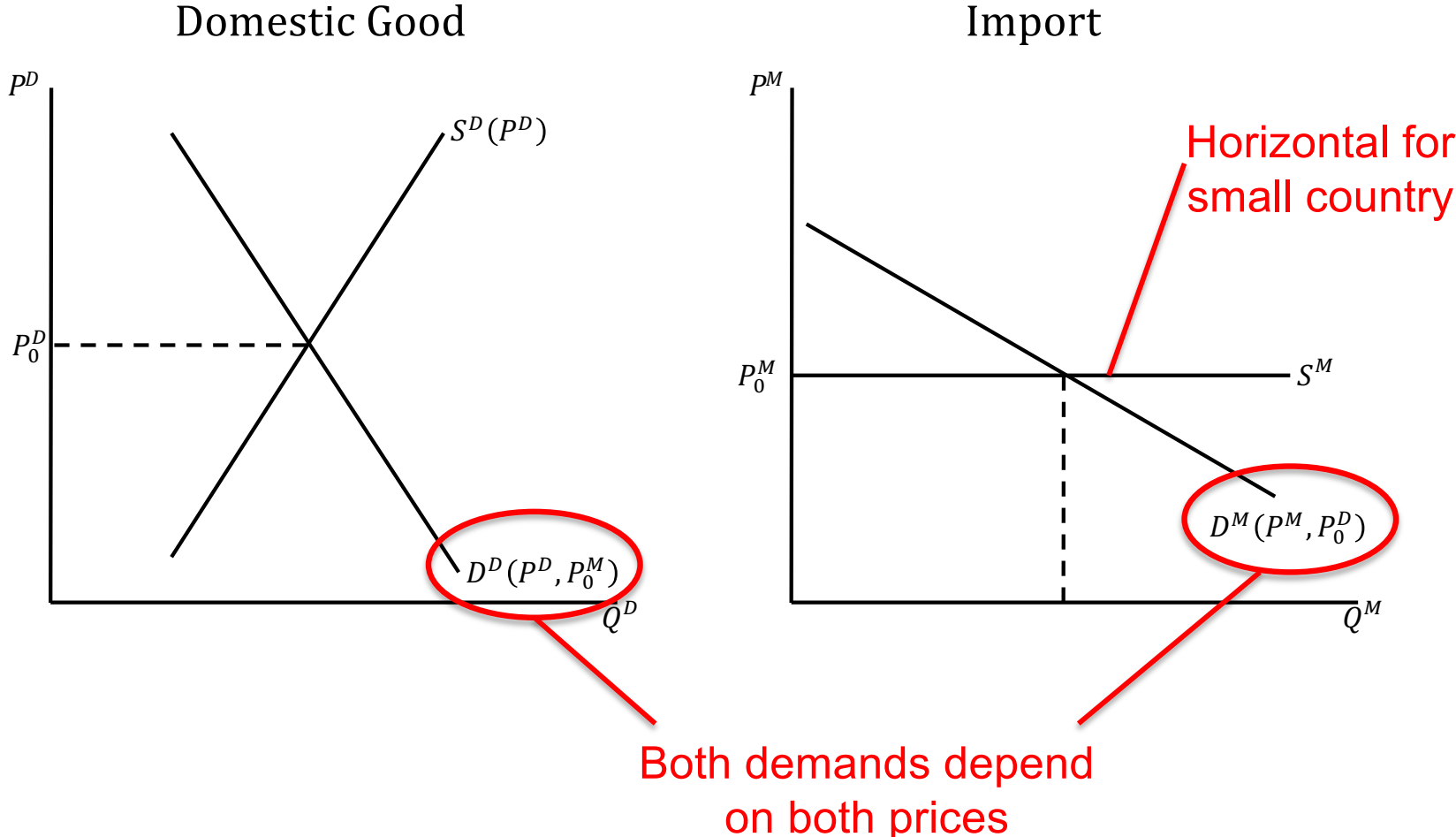
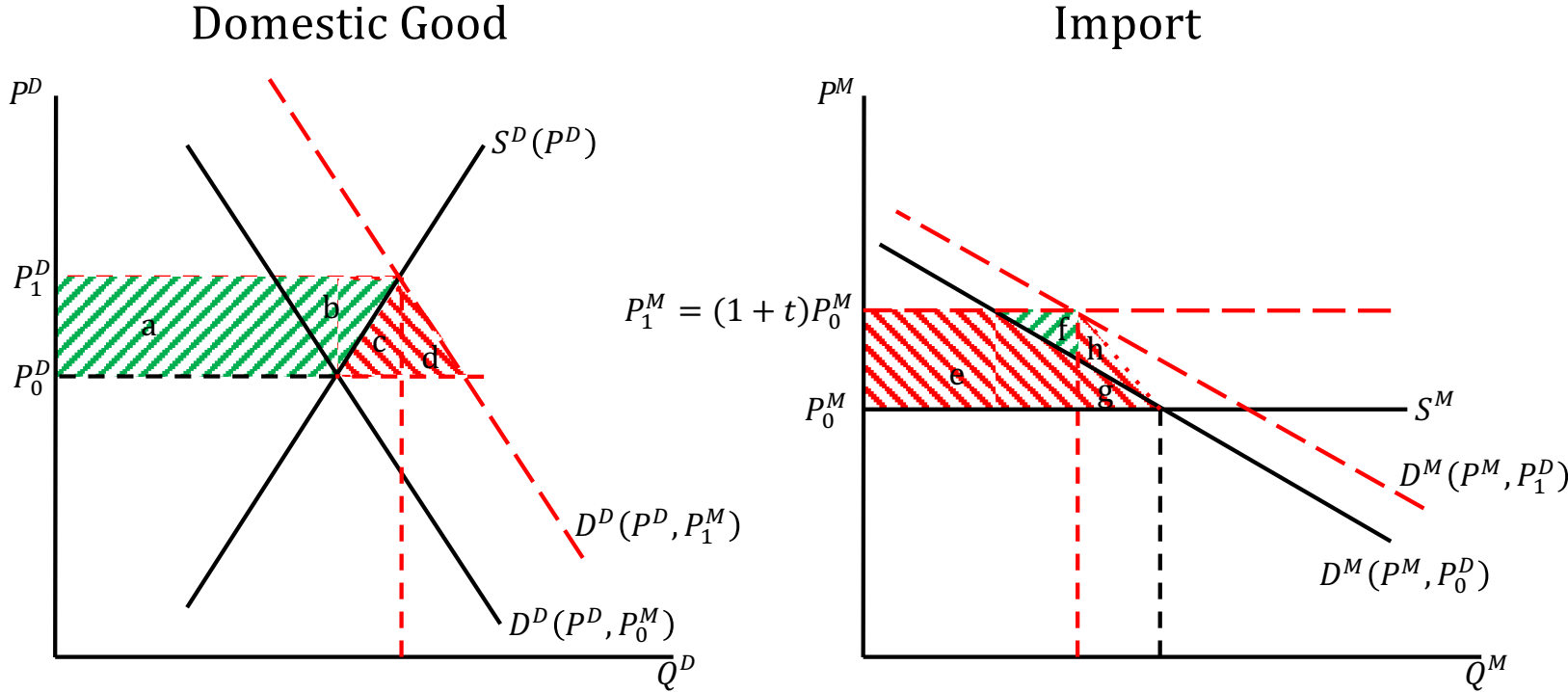


Figure 4
Tariff on Imported Imperfect Substitute for Domestic Good

Differentiated-Product Import, Small Country



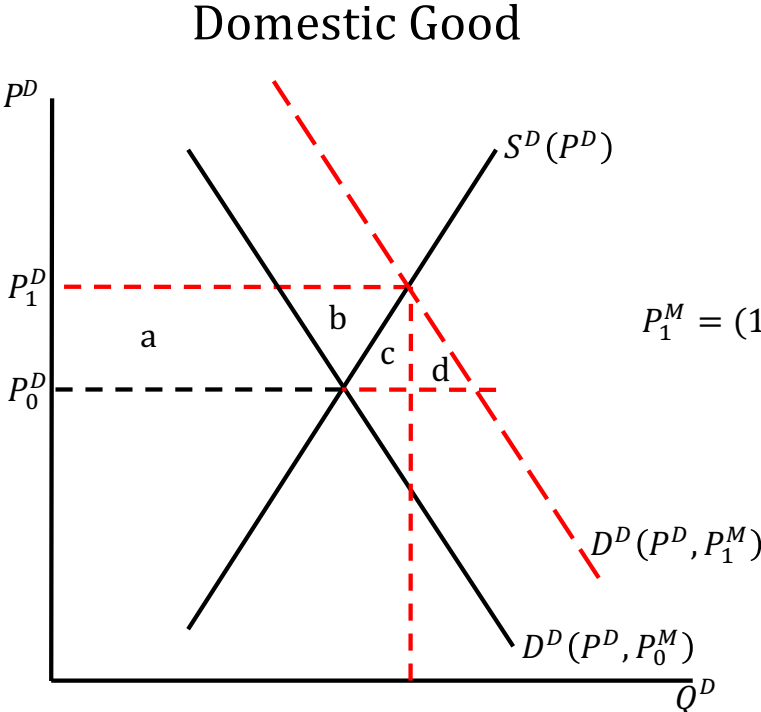
Welfare Effects of Tariff:	
Dom sup's	$+(a+b)$
Dom dem's	$-(a+b+c+d)$
	& $-(e+g)$
Dom gov't	$\frac{+(e+f)}{-(c+d+g-f)}$
Dom cty	

But $(c+d) = (f+h)$
(Why? Trust me.)

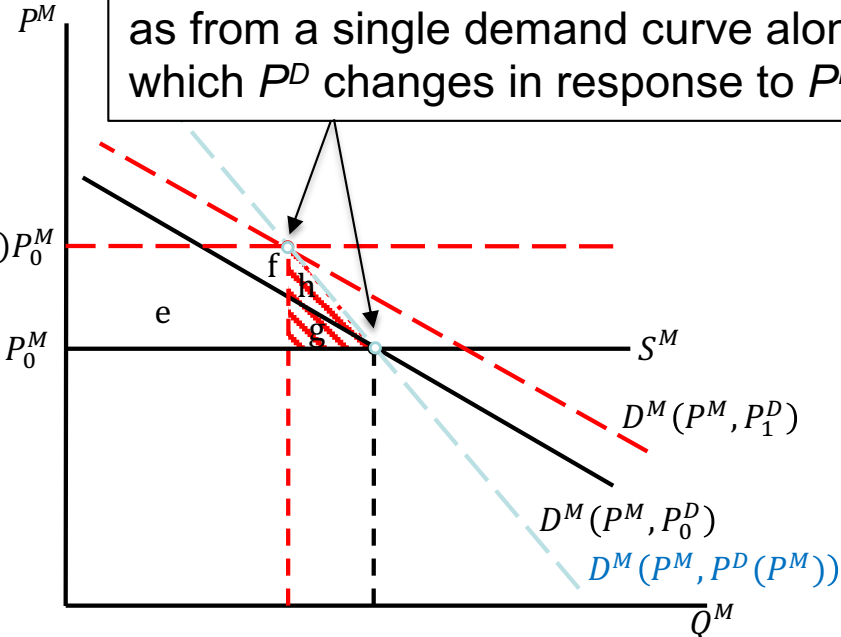
So
 Dom cty $-(f+h+g-f)$
 $= -(h+g)$

Figure 4
 Tariff on Imported Imperfect Substitute for Domestic Good

Differentiated-Product Import, Small Country



These 2 pts from 2 demand curves for different P^D s can be thought of instead as from a single demand curve along which P^D changes in response to P^M .



$D^M(P^M, P_0^D)$
Is “*ceteris paribus*”
demand curve

$D^M(P^M, P^D(P^M))$
Is “*mutatis mutandis*”
demand curve

Welfare Effects of Tariff:	
Dom sup's	+(a+b)
Dom dem's	-(a+b+c+d)
	& -(e+g)
Dom gov't	$\frac{+(e+f)}{}$
Dom cty	-(c+d+g-f)

But (c+d) = (f+h)	
<u>(Why? Trust me.)</u>	
So	
Dom cty	-(f+h+g-f)
	= -(h+g)

Figure 4
Tariff on Imported Imperfect Substitute for Domestic Good

Note on the Latin

- *Ceteris paribus* =
 - “other things being equal”
 - or here: “other prices being held constant”
- *Mutatis mutandis* =
 - “with things changed that should be changed”
 - or here: “other prices changing in response”

Differentiated-Product Import, Small Country

- Bottom line:
 - You can correctly analyze a tariff on a differentiated import if you
 - Use just the market for it
 - With “*mutatis mutandis*” import demand curve
 - That is, one that does not hold the domestic price constant
 - But rather allows that price to change in response to the change in price of import
 - This will not, however, tell you what happens to
 - Price and quantities of the domestic good

Differentiated-Product Import, Small Country

- What is needed to fully analyze a tariff on a differentiated product

- “Cross elasticity of demand”

- The elasticity of demand for the domestic good with respect to the price of the import:

$$\chi^{MD} = \frac{\Delta Q^D}{Q^{D0}} / \frac{\Delta p^M}{p^{M0}}$$

- The elasticity of demand for the import with respect to the price of the domestic good:

$$\chi^{DM} = \frac{\Delta Q^M}{Q^{M0}} / \frac{\Delta p^D}{p^{D0}}$$

Differentiated-Product Import, Small Country

- Cross elasticities
 - These will both be positive if the goods are substitutes
 - As they will be for differentiated products
 - Larger cross elasticity means closer substitutes
 - They would both be negative if the goods were complements, such as different products that are typically used together (e.g., bread and butter, wine and cheese, cars and gasoline)
 - These are even harder to find out values for than (own) supply and demand elasticities

Pause for Discussion

Questions

- If a country does not produce a good that is identical to something that it imports, does it follow that there would be no interest in levying a tariff on those imports?
- How would the analysis in Figure 4 differ if the imported good were a complement to the domestic good rather than a substitute?

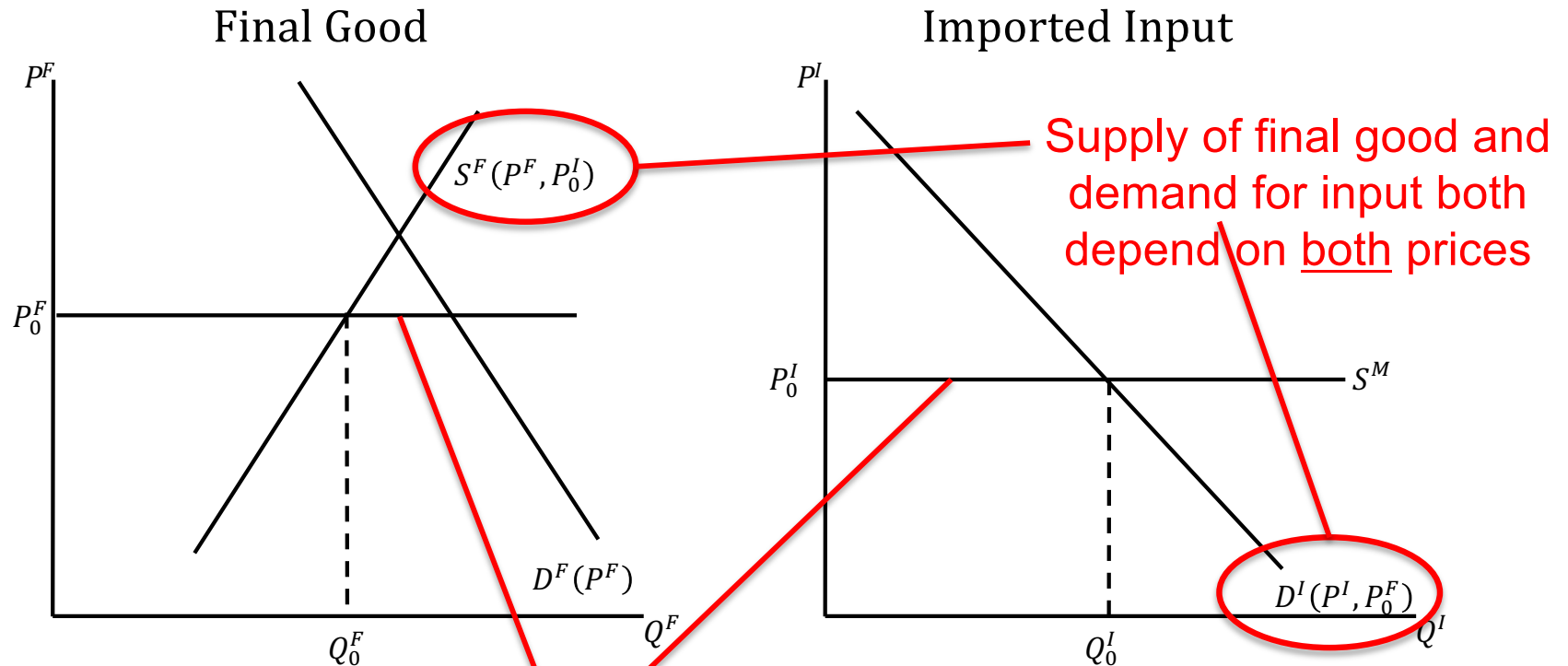
Questions

- How does the effect of a tariff in a small country differ depending on whether the import is identical to the domestic good or it is differentiated?
- With an unchanged tariff in the two-country model with imperfect substitutes, what will happen to prices in the two countries if there is a right-ward shift of
 - Home supply
 - Home demand
 - Foreign demand

Outline

- Large country tariff
- Differentiated-Product Import, Small Country
- **Import of Input to Production of Final Good**
- Tariff on Imports from One Country but Not Another

Tariff on Input to Production of Traded Final Good

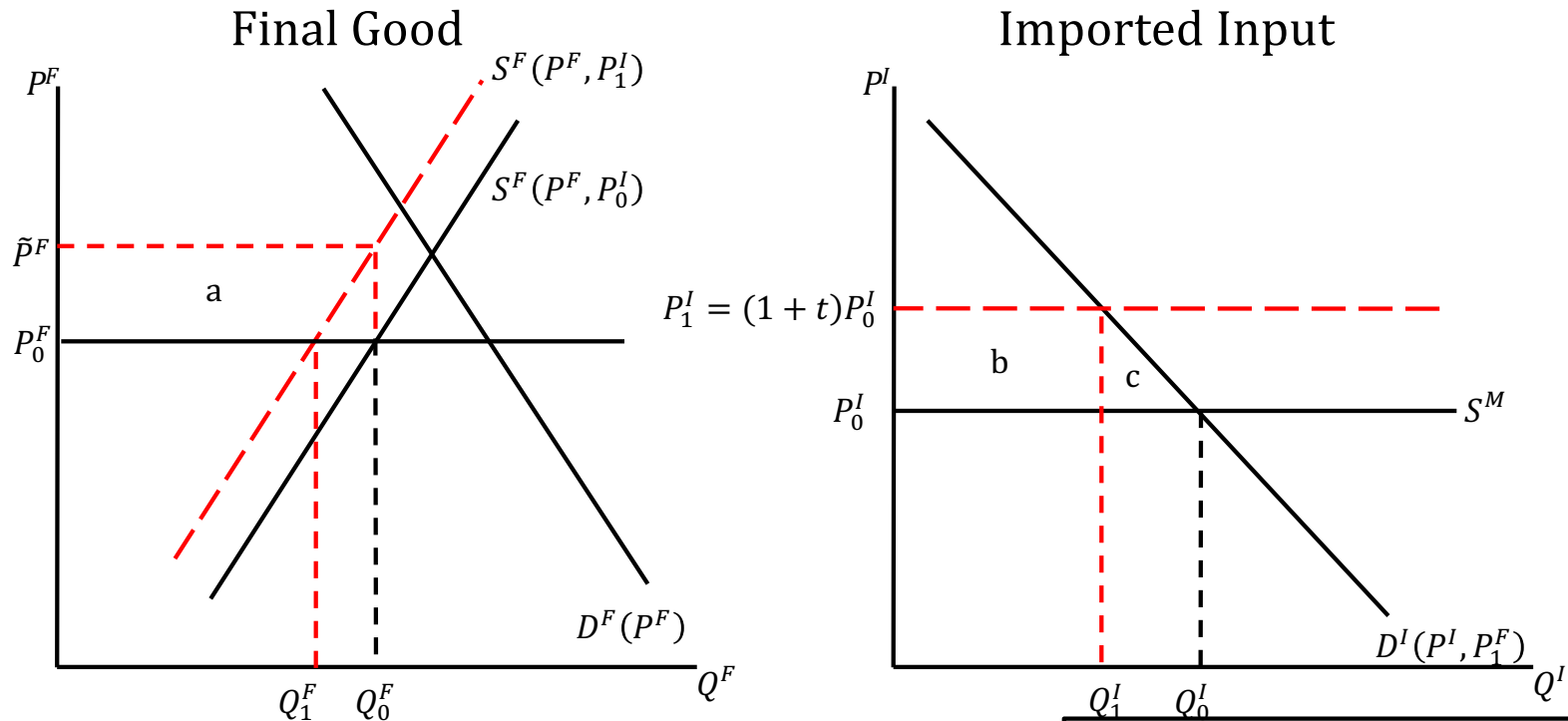


Note: In this case the position of DF does not matter, since PF does not change. Final good may be imported or exported.

Small country again, and both goods traded, so prices fixed in world market

Figure 5
Tariff on Imported Input to Traded Final Good Production

Tariff on Input to Production of Traded Final Good



Welfare Effects of Input Tariff	
• Dom sup's lose	$-a = -(b+c)$
• Dom dem's unhurt	0
• Dom gov't	+b
• Dom cty	-c

Why a?

- S^F shifts up by cost increase.
- If P^F had risen to \tilde{P}^F then suppliers would have been unharmed.
- Their loss from price not rising is area a

Figure 5

Tariff on Imported Input to Traded Final Good Production

Tariff on Input to Production of Non-Traded Final Good

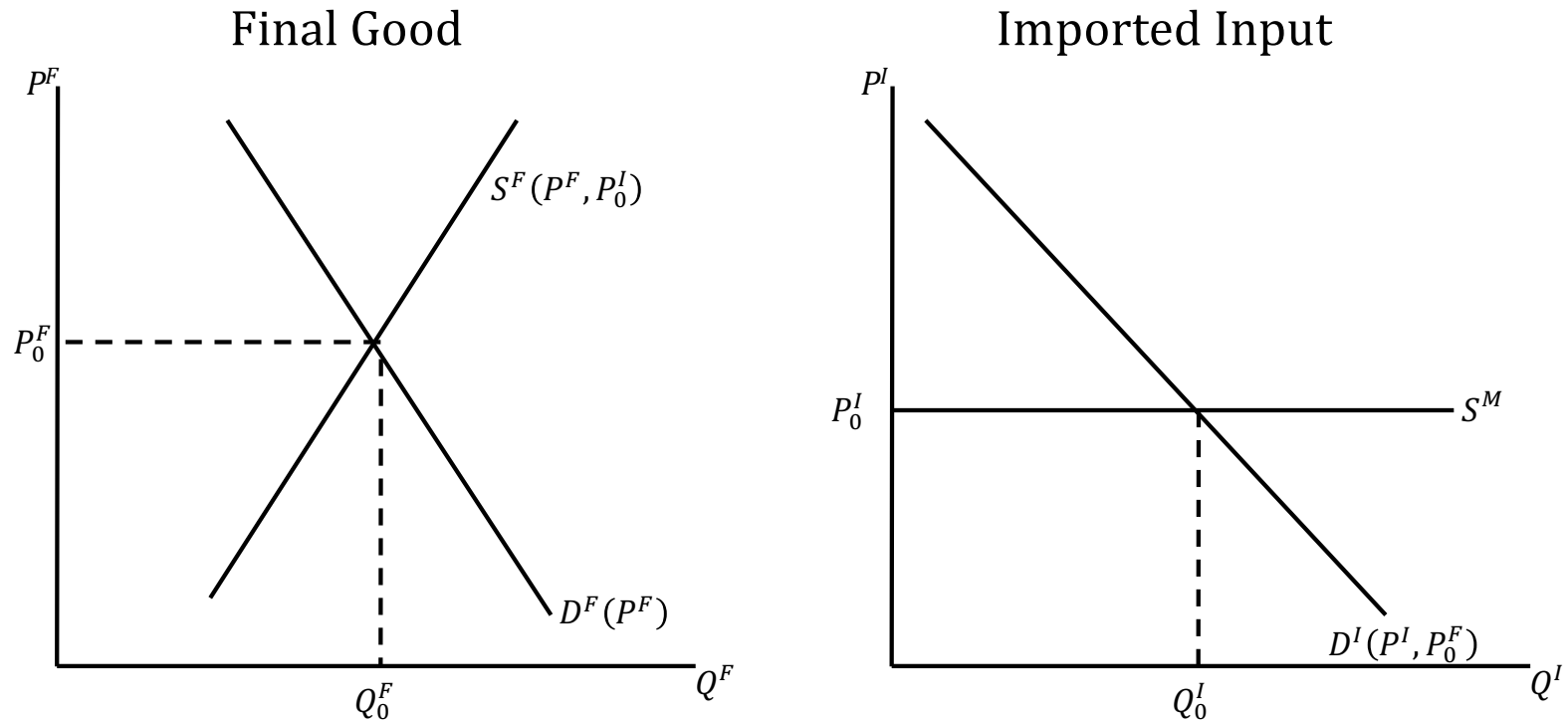


Figure 5

Tariff on Imported Input to Production of Non-traded Final Good

Tariff on Input to Production of Non-Traded Final Good

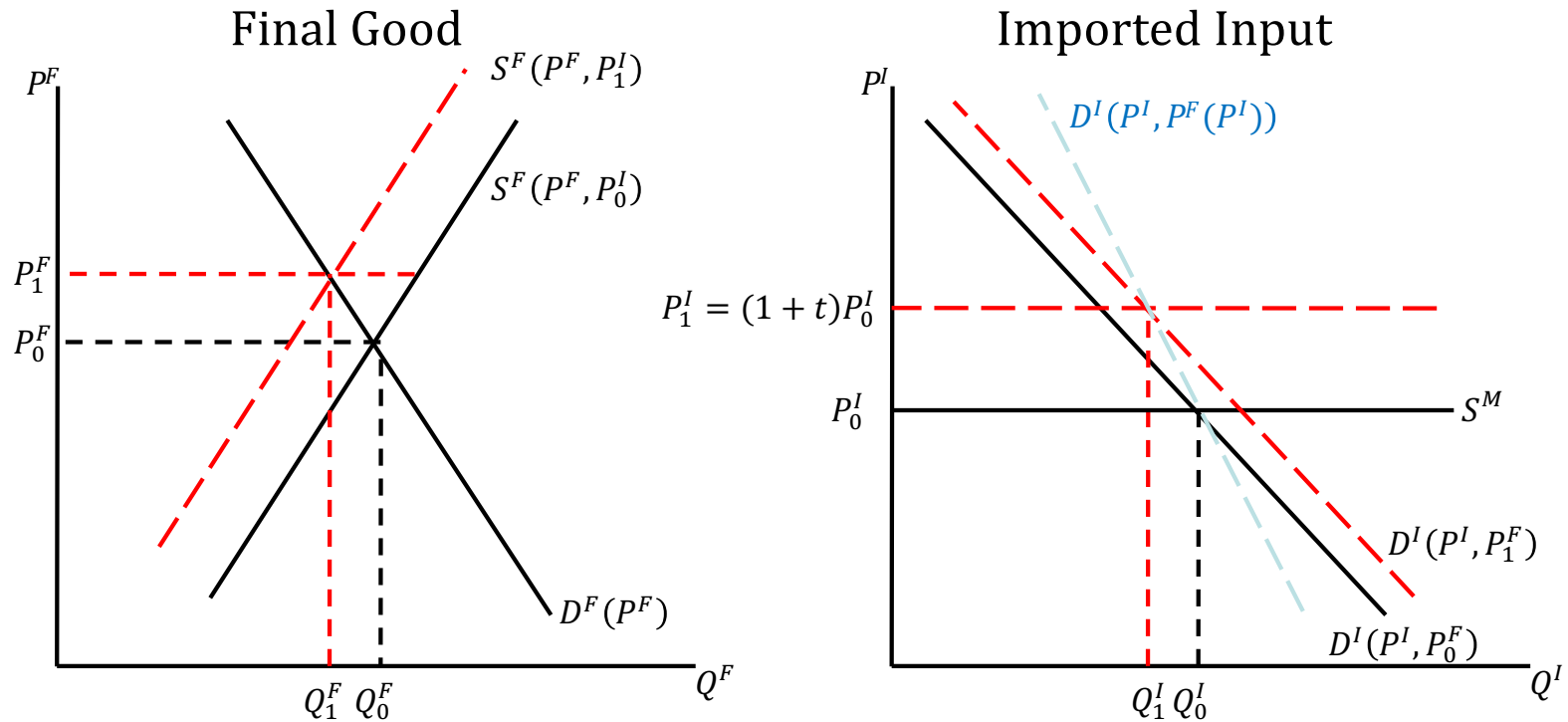
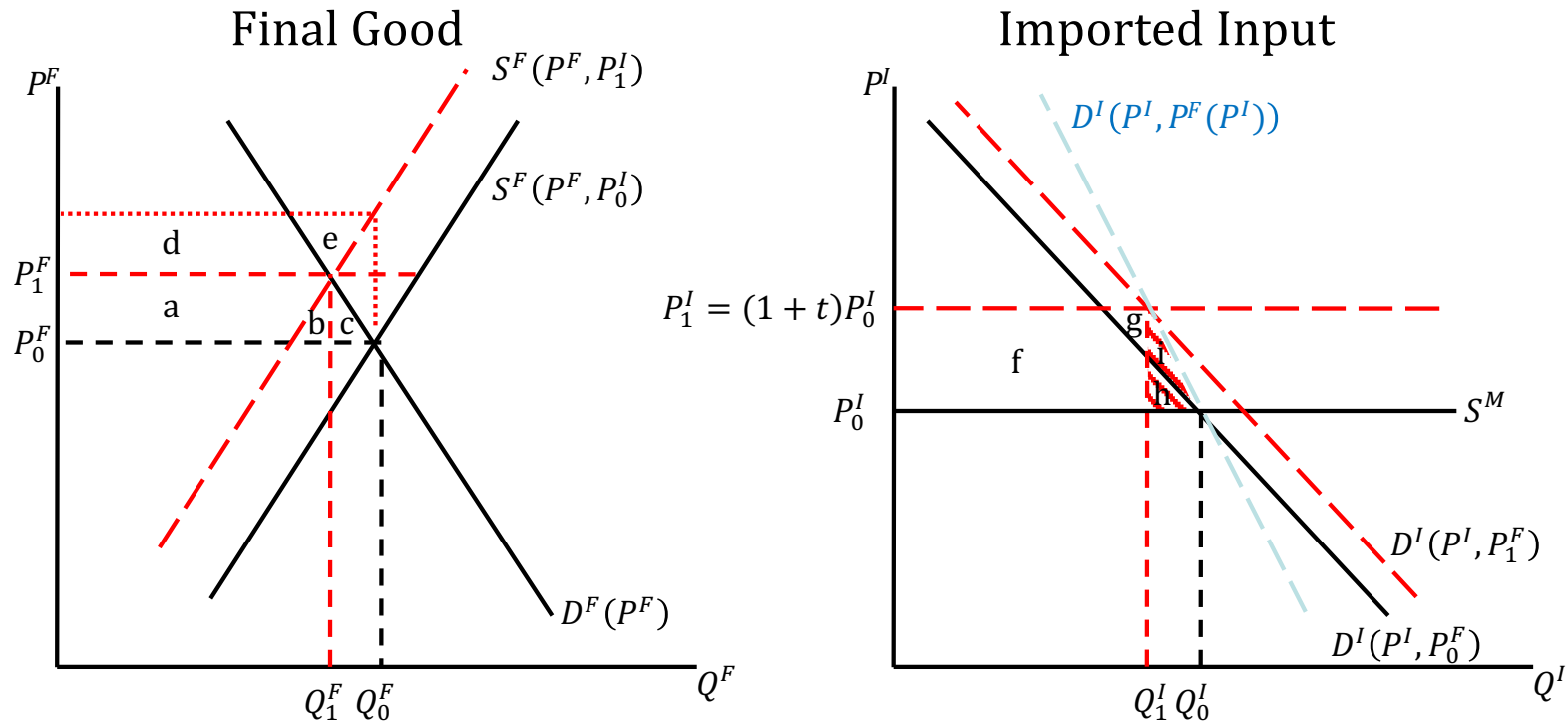


Figure 5

Tariff on Imported Input to Production of Non-traded Final Good

Tariff on Input to Production of Non-Traded Final Good



Welfare Effects of Input Tariff:		But $(a+d+e) = (f+h)$ = what suppliers would have lost if P^F had not risen So Dom cty $-(a+b+c+d+e)+(f+g)$ $= -(b+c) - (f+h) + (f+g)$ $= -(b+c+h)+g$	And $(b+c) = (g+i)$ The extra net loss to the private sector due to price rise from P_0^F to P_1^F So Dom cty $-(i+h)$
Dom sup's	$-(d+e)$		
Dom dem's	$-(a+b+c)$		
Dom gov't	$+(f+g)$		
Dom cty	$-(a+b+c+d+e)+(f+g)$		

Figure 5

Tariff on Imported Input to Production of Non-traded Final Good

Tariff on Input to Production of Traded or Non-Traded Final Good

- In either case, if we don't need to see the separate effects on domestic suppliers and demanders...
- The net welfare effect of the tariff can be found from just the import demand curve.
- BUT:
 - If the final good's price will rise with its increase in cost (thus other than the small country traded final good), the import demand curve should be the *mutatis mutandis* one that takes account of that final good price increase.

Pause for Discussion

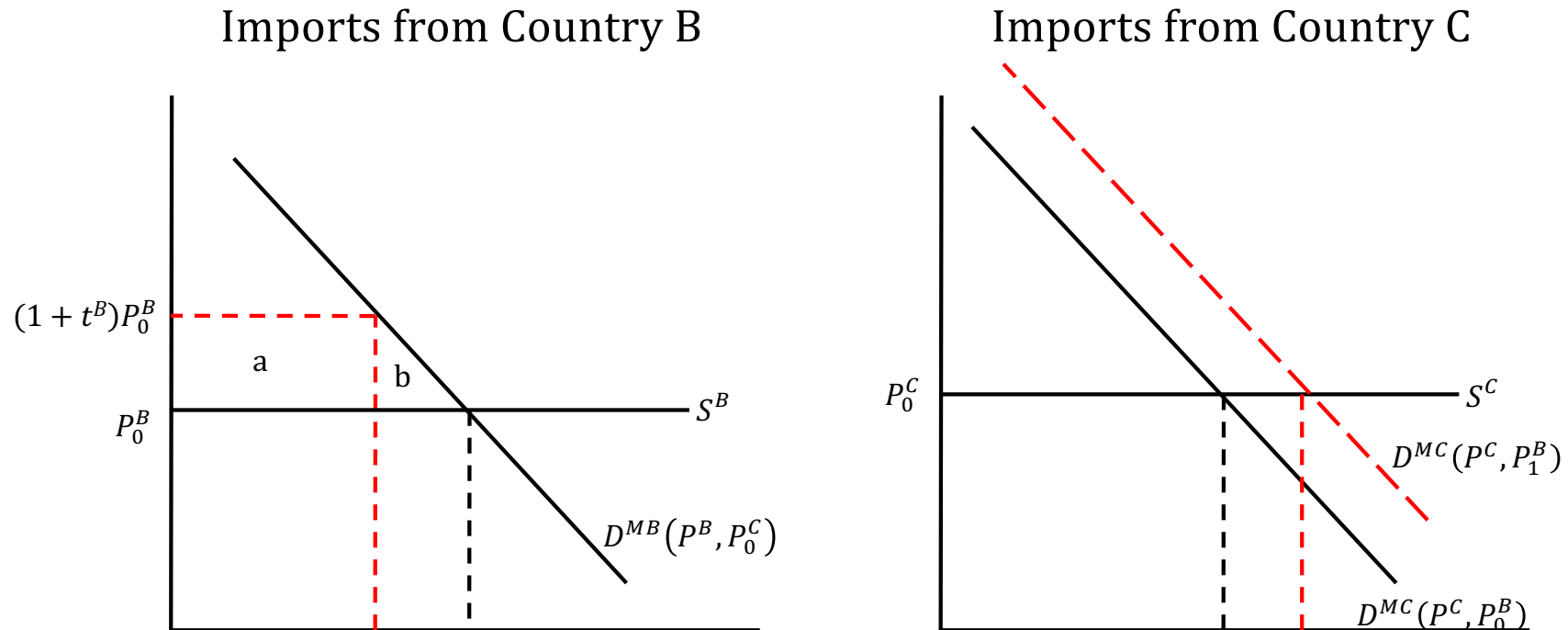
Questions

- What, if anything, does this analysis tell you about the effects of Trump's tariffs on steel and aluminum? Aside from producers of the metals themselves, who is hurt and who is helped?

Outline

- Large country tariff
- Differentiated-Product Import, Small Country
- Import Input to Production of Final Good
- **Tariff on Imports from One Country but Not Another**

Tariff on One Country but Not Another with foreign countries exporting imperfect substitutes



Welfare Effects of Tariff on B:	
Dom pvt	$-(a+b)$
Dom gov't	$\frac{+a}{\quad}$
Dom cty	$-b$

Figure 6
Tariff on imports from only Country B,
imperfect substitute for imports from Country C

Pause for Discussion

Questions

- Trump levied large tariffs on exports from China.
 - Based on this analysis, what would you expect the effects of those tariffs to be
 - On the exports of China?
 - On the exports of other countries?
 - How would it be different if foreign export supply curves were upward sloping?
 - How would it be different if imports from other countries were perfect substitutes?

