

Import Stockpiling & Anticipated Tariff Changes

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This sector-specific partial equilibrium (PE) model quantifies the reaction of imports to an anticipated future tariff increase. If it is economical to stockpile, there will be a surge of imports with the announcement of a future tariff increase and a magnified decline in imports after the tariff increase occurs. This version of the model has THREE sources of supply: domestic production, imports subject to the tariff policy change, and imports not subject to the tariff policy change. There are three periods in the model: an initial period prior to the announcement of the future tariff change (period 0), a second period when the future tariff change is announced (period 1), and a final period when the new tariff rate is imposed permanently (period 2). The model only addresses the possibility of stockpiling the subject imports, not non-subject imports or the domestic good. Consumers have CES preferences for foreign and domestic products, and there is perfect competition in the product market within each period. There is also a user-specified period 2 demand shift shock in the model.

The user inputs initial expenditures on the foreign and domestic products in the initial period, the initial and new tariff rate, elasticity parameters, time cost of money, and ad valorem storage costs. The user can modify data inputs in the simulation by changing the values in the ORANGE - shaded lines in the notebook below. The spreadsheet will update the estimated changes in economic outcomes that are reported in the GREEN - shaded cells once the user selects “Evaluate Notebook” under “Evaluation” in the Menu above.

This model is provided as a generic analytical tool, and the data and parameter values are fictional and illustrative. Actual data and parameter values should be supplied by the user based on the industry and market to which the model is applied. The model is the result of ongoing professional research of USITC staff and may be updated. The model is not meant to represent in any way the view of the U.S. International Trade Commission or any of its individual Commissioners. The model is posted to promote the active exchange of ideas between USITC staff and experts outside the USITC and to provide useful economic modeling tools to the public.

`ln[]:= ClearAll [f] ;`

Inputs

Elasticity of Substitution

$ln[\sigma] :=$ **$\sigma = 4;$**

Total Price Elasticity of Demand for the Sector

$ln[\eta] :=$ **$\eta = -1;$**

Supply Elasticity of Domestic Shipments

$ln[\epsilon_d] :=$ **$\epsilon_d = 2;$**

Supply Elasticity of Subject Imports

$ln[\epsilon_s] :=$ **$\epsilon_s = 5;$**

Supply Elasticity of Non-Subject Imports

$ln[\epsilon_n] :=$ **$\epsilon_n = 5;$**

Initial Ad Valorem Tariff on Subject Imports in Periods 0 and 1

$ln[ts_0] :=$ **$ts_0 = 0;$**

New Ad Valorem Tariff in Period 2

$ln[ts_2] :=$ **$ts_2 = 0.25;$**

Expenditures

$ln[v_{domestic}] :=$ **$v_{domestic} = 50;$**

$ln[v_{subject}] :=$ **$v_{subject} = 25;$**

$ln[v_{nonsubject}] :=$ **$v_{nonsubject} = 25;$**

Ad Valorem Carrying (or Storage) Costs

$ln[cc] :=$ **$cc = 0.05;$**

Interest Rate

$ln[r] :=$ **$r = 0.05;$**

Anticipated Exogenous Rate of Growth in Market Demand between Period 1 and Period 2 (could be positive or negative)

$ln[gr] :=$ **$gr = -0.10;$**

Hidden Sections

Summary of Economic Effects

Fraction of subject imports produced in period 1 that are stockpiled until period 2 (%)

$ln[*]:=$ **Fraction**

$Out[*]:=$ 5.50994

price of domestic shipments (% Change)

$ln[*]:=$ **pd1hat**

$Out[*]:=$ 0.134162

producer price of subject imports (% Change)

$ln[*]:=$ **ps1hat**

$Out[*]:=$ 0.721702

producer price of non-subject imports (% Change)

$ln[*]:=$ **pn1hat**

$Out[*]:=$ 0.0894216

quantity of domestic shipments (% Change)

$ln[*]:=$ **qd1hat**

$Out[*]:=$ 0.268505

quantity of subject imports (% Change)

$ln[*]:=$ **qs1hat**

$Out[*]:=$ 3.66097

quantity of non-subject imports (% Change)

$ln[*]:=$ **qn1hat**

$Out[*]:=$ 0.447908

Effects in period 2 with stockpiling

price of domestic shipments (% Change)

$\ln[\ast] :=$ **pd2hat**

$\text{Out}[\ast] := -1.01504$

producer price of subject imports (% Change)

$\ln[\ast] :=$ **ps2hat**

$\text{Out}[\ast] := -11.5789$

consumer price of subject imports (% Change)

$\ln[\ast] :=$ **cps2hat**

$\text{Out}[\ast] := 10.5263$

producer price of non-subject imports (% Change)

$\ln[\ast] :=$ **pn2hat**

$\text{Out}[\ast] := -0.677844$

quantity of domestic shipments (% Change)

$\ln[\ast] :=$ **qd2hat**

$\text{Out}[\ast] := -2.01978$

quantity of subject imports

$\ln[\ast] :=$ **qs2hat**

$\text{Out}[\ast] := -45.9522$

quantity of non-subject imports

$\ln[\ast] :=$ **qn2hat**

$\text{Out}[\ast] := -3.34358$