Derivation of price for trade between high-wage land and low-wage land

price of imported item in High Wage Land:

\[
\text{Price} \left( \text{dollars per item} \right) = \left( \frac{1}{\text{LWL productivity item}} \right) \left( \frac{\text{wage coins per hour}}{\text{wage}} \right) \left( \frac{1}{\text{share}} \right) \left( \text{ER dollars per coin} \right)
\]

Derive this equation by rewriting

labor share \times price \times quantity produced = wage \times labor hours

price of domestically-produced item in High Wage Land:

\[
\text{Price} \left( \text{dollars per item} \right) = \left( \frac{1}{\text{HWL productivity item}} \right) \left( \frac{\text{wage dollars per hour}}{\text{wage}} \right) \left( \frac{1}{\text{share}} \right)
\]

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The equation is derived from equation ?? on page ??.

Note: there is no exchange rate conversion for the domestically manufactured item, and the high wage land (HWL) productivity is used.

Multiply the low-wage-land wage rate by the exchange rate to convert that wage to dollars:

\[
\left( \text{LWL wage in dollars per hour} \right) = \left( \frac{\text{wage coins per hour}}{\text{wage}} \right) \left( \text{ER dollars per coin} \right)
\]

Suppose the shares paid to labor are the same in the two countries. Then the price ratio of the domestically produced product to the imported product becomes:

\[
\frac{\text{domPrice} \left( \text{dollars per item} \right)}{\text{impPrice} \left( \text{dollars per item} \right)} = \left( \frac{1}{\text{HWL productivity item}} \right) \left( \frac{\text{wage dollars per hour}}{\text{wage}} \right) \left( \frac{1}{\text{share}} \right) \left( \frac{1}{\text{LWL productivity item}} \right) \left( \frac{\text{wage coins per hour}}{\text{wage}} \right) \left( \frac{1}{\text{share}} \right)
\]

Cancel out the shares:

\[1 \text{Rewrite } s_1 \left( \frac{Z}{L_1} \right) = \frac{w_1}{p} \text{ as } p = \left( \frac{L_1}{Z} \right) w \left( \frac{1}{s_1} \right) \text{ and recall } L_1/Z \text{ is the reciprocal of productivity.} \]
\[
\frac{\text{domPrice}}{\text{impPrice}} = \frac{1}{\HWLproductivity \text{ hours per item}} \left( \frac{\text{wage dollars per hour}}{\text{wage coins per hour}} \right)
\]

If the low-wage-land wage is only an eighth of the high-wage land, but the productivity is also one-eighth of the high wage land productivity, the low wage land has no cost advantage:

\[
\frac{\text{domPrice}}{\text{impPrice}} = \frac{1}{\HWLproductivity \text{ hours per item}} \left( \frac{\text{wage dollars per hour}}{\text{wage coins per hour}} \right)
\]