Data Lab 3

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I. Baseline results

Equilibrium relative price. The equilibrium relative price (P_M/P_A) is 0.8338, indicating that manufactured (M) goods are relatively cheaper than agriculture (A) goods in the baseline equilibrium.

Wages. In the Home country, the wage (w_H) is 0.6251. In the Foreign country, the wage (w_F) is 0.4375. Home has a higher wage due to its greater factor endowments (K_H=4.0 vs K_F=2.0 for capital, and T_H=3.0 vs T_F=1.0 for land).

Labor allocations. In the Home country, M employed 2.29 workers (45.8% of labor) and A employed 2.71 workers (54.2% of labor). In the Foreign country, M employed 2.80 workers (56.0% of labor) and A employed 2.20 workers (44.0% of labor). Foreign allocates more labor to M despite having less capital, due to the equilibrium price structure.

Outputs. In the Home country, the M output (Y_H,M) is 2.86 units whereas the A output (Y_H,A) is 2.82 units. In the Foreign country, M output (Y_F,M) is 2.45 units whereas the A output (Y_F,A) is 1.61.

Baseline observations. Given that both countries have identical demand shares ($\alpha = 0.5$ for A) and incomes are determined by production, Home has an absolute advantage in both goods but a comparative advantage in A. However, with the equilibrium price P_M/P_A = 0.8338, the Foreign country specializes more in M (56% of labor vs Home's 46%), suggesting Foreign may export M while Home exports A.

After shock analysis on next page →

II. After shock (a 20% increase in M productivity) results

New equilibrium price & productivity changes. The new equilibrium price (p* = new P_M/P_A) decreases from 0.8338 to 0.6948 (a 16.67% decline). The productivity increase in M shifts the relative supply curve rightward, creating excess supply of M goods and requiring a lower relative price to clear the market. M productivity (Z_M) increases from 1.0 to 1.2 in both countries. A productivity (Z_A) remains at 1.0.

Labor allocations. In the Home country, M employed 2.29 workers, whereas A employed 2.71 workers. In the Foreign country, M employed 2.80 workers, whereas A employed 2.20 workers. Despite higher productivity, equilibrium price adjustments offset incentives for labor reallocation, keeping distribution stable.

New outputs. In the Home country, M increases from 2.86 → 3.44 units (+20.0%), whereas A remains unchanged at 2.82. In the Foreign country, M: increases from 2.45 → 2.94 (+20.0%), whereas A remains unchanged at 1.61. M output rises proportionally with productivity, while A remains unchanged.

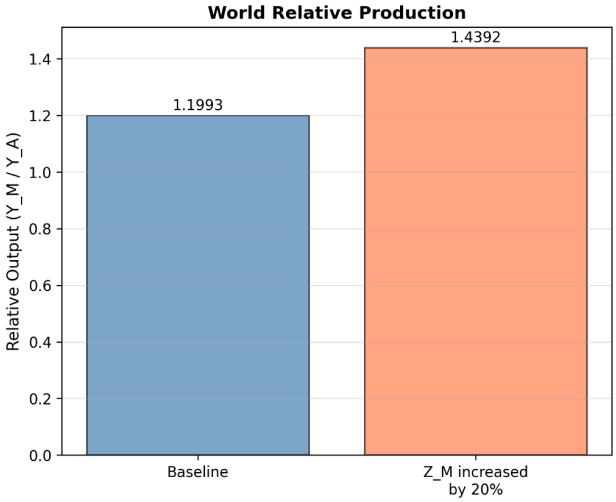
Relative world production & prices. The relative world production (Y_M/Y_A) increases from 1.199 → 1.439 (+20.0%). Relative price (P_M/P_A): decrease from 0.8338 → 0.6948 (–16.67%). Supply increases drive down relative price to restore equilibrium.

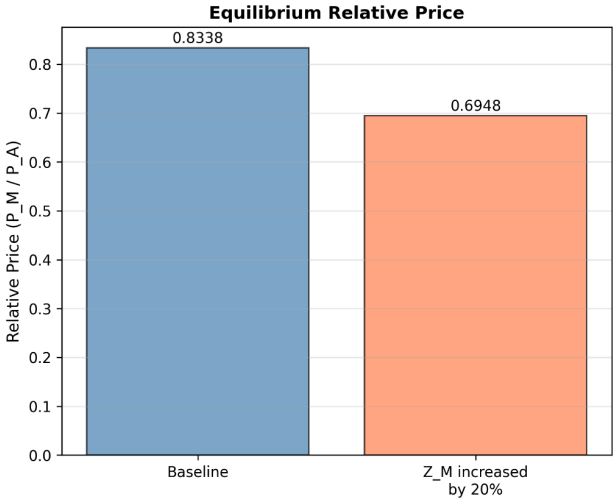
Real wages & welfare. Real wages in terms of A (w/P_A) remain unchanged (Home: 0.6251, Foreign: 0.4375). Comparatively, real wages in terms of M (w/P_M) saw an increase from 0.7497 → 0.8996 (+20.0%) in the Home country and 0.5247 → 0.6296 (+20.0%) in the Foreign country.

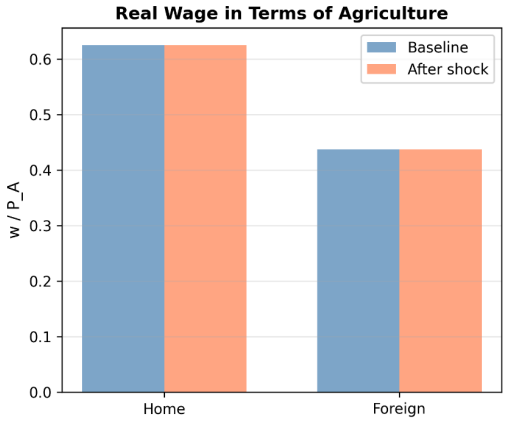
After shock observations. Both countries experience welfare gains following a 20% rise in Z_M. Higher M productivity shifts relative supply rightward, lowering the relative price P_M/P_A. With wages in A-units remaining constant, real wages in M (w/P_M) rise 20%, boosting purchasing power for M goods while w/P_A remains unchanged. Productivity gains pass through to consumers via lower prices, yielding economy-wide welfare improvements through market adjustment.

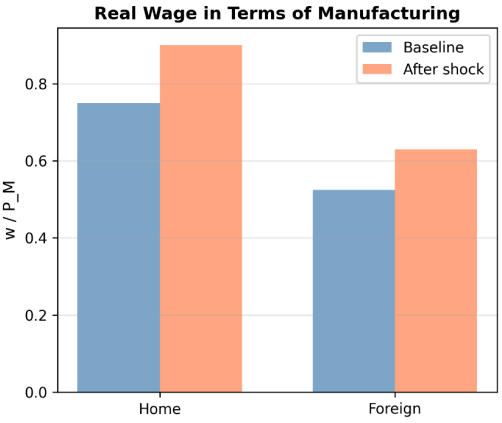
Figures on next page →

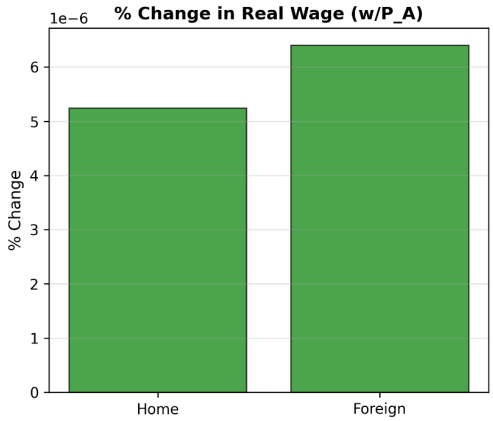
III. Figures

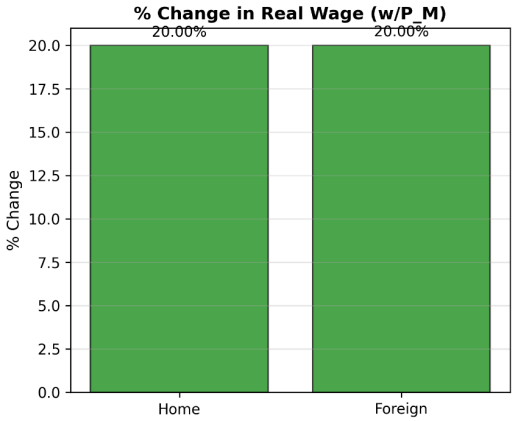

World Relative Production
Relative Output (Y_M / Y_A)
1.1993
1.4392
Baseline
Z_M increased by 20%


Equilibrium Relative Price
Relative Price (P_M / P_A)
0.8338
0.6948
Baseline
Z_M increased by 20%


Real Wage in Terms of Agriculture
w / P_A
Baseline
After shock
Home
Foreign


Real Wage in Terms of Manufacturing
w / P_M
Baseline
After shock
Home
Foreign


% Change in Real Wage (w/P_A)
1e−6
% Change
Home
Foreign


% Change in Real Wage (w/P_M)
20.00%
20.00%
% Change
Home
Foreign