



ANSWER KEY: Robert Solow and Total Factor Productivity

Table 1. Direct effects of 10% TFP growth in US manufacturing (% change from base)	
Item	% change
MFG output quantity (QX)	3.6
MFG sales price (PA)	-3.8
Labor employed in MFG	-5.9
Domestic demand quantity for MFG (QQ)	2.6
Export quantity of MFG (QE)	5.8
Import quantity of MFG (QM)	1.0

Table 2. General equilibrium effects of 10% TFP growth in US manufacturing (% change from base)	
Item	% change
Real GDP (GDPMP)	1.5
Private consumption (PRVCON)	1.5
Investment demand (FIXINV)	1.5
Gov't demand (GOVCON)	0.5
Agriculture output quantity (QX)	1.8
Agriculture export quantity (QE)	-1.2
Services output quantity (QX)	1.2
Services export quantity (QE)	-2.4
Exchange rate (EXR)	-1.0

2. As productivity increases, a smaller quantity of labor can produce a larger quantity of output.
3. Price of labor input falls.
4. Due to product differentiation, consumers want to consume some of both varieties, so domestic supply will not fully replace imports. Income growth increase demand for both varieties.
6. Savings-driven closure. MPS is fixed so level of household savings rises with income. Increased supply of savings leads to higher investment spending.
7. Negative result means exchange rate appreciation. Increased productivity leads to higher export supply. Closure fixes trade balance – to prevent trade surplus, exchange rate must appreciate.

8. Full employment closure means that labor leaving MFG must be employed in AGR and SER. Wages fall so demand for labor by and AGR and SER increases.
9. The exchange rate effect is one factor.