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What Determines the Demand for Goods and Services?

In Chapter 3, Mankiw presents a simple model of aggregated demand. The model is simple in the sense that it ignores some economic ideas that will be introduced later in the course. The following equations provide a linear version of Mankiw's model. Y^D is the level of aggregate demand.

$$Y^D = C + I + G + NX \quad (1)$$
$$C = a + c(Y-T) \quad (2)$$
$$I = \bar{I} - dr \quad (3)$$
$$G = \bar{G} \quad (4)$$
$$T = \bar{T} \quad (5)$$
$$NX = \bar{NX} \quad (6)$$
$$Y^D = Y \quad (7)$$

Note: Y^D is aggregate demand, C is consumption, I is investment, G is government spending, NX is net exports, T is government taxes, and r is the real rate of interest. The bars signify constant values. The symbols c and d are "sensitivity parameters." Parameter c gives the increase in C that results from a one-dollar increase in Y-T. Parameter d gives the decrease in I that results from a one percentage point increase in the interest rate.

The first equation is a definition of aggregate demand based on the national income accounts. The second equation is a hypothesis about consumption–that consumption is a linear function of disposable income, Y-T. The third is a hypothesis about investment–that investment is inversely related to the real rate of interest. The fourth, fifth and sixth equations say that government spending, Taxes, and net exports are assumed to be exogenous. We will relax those assumptions later. The seventh equation says that the economy is in equilibrium in that the quantity of goods demanded equals the quantity supplied.

A solution is a rule that shows how an endogenous variable depends on the set of exogenous variables provided that each structural equation holds. It is the mapping from the exogenous to the endogenous variables induced by the structural equations. The exogenous variables are: $\bar{I}, \bar{G}, \bar{T}, \bar{NX}$.

The solution for Y is obtained as follows:

$$Y = Y^D$$
$$Y = C + I + G + NX$$
$$Y = (a + cY - c\bar{T}) + (\bar{I} - dr) + \bar{G} + \bar{NX}$$
$$Y = \frac{A - dr}{1-c}$$

where $A = a + \bar{I} + \bar{G} + \bar{NX} - c\bar{T}$

Questions:

1. If NX goes up by one dollar, by how much will output rise? The answer is not 1–why not? What economic forces explain why Y increases by a multiple of the increase in NX?
2. For what question is d/(1-c) an answer?