

## 8.1: Overview of National Output Determination

### Learning Objective

1. Understand the structure and results of the basic Keynesian model of national output determination.

This chapter describes how the supply and demand for the national output of goods and services combine to determine the equilibrium level of national output for an economy. The model is called the goods and services market model, or just the G&S market model.

In this model, we use gross national product (GNP) as the measure of national output rather than gross domestic product (GDP). This adjustment is made because we wish to define the trade balance ( $EX - IM$ ) as the current account (defined as the difference between exports and imports of goods, services incomes payments/receipts, and unilateral transfers). This adjustment is discussed in more detail in [Section 8.6](#).

The diagram used to display this model is commonly known as the Keynesian cross. The model assumes, for simplicity, that the amount of national output produced by an economy is determined by the total amount demanded. Thus if, for some reason, the demand for GNP were to rise, then the amount of GNP supplied would rise up to satisfy it. If demand for the GNP falls—for whatever reason—then supply of GNP would also fall. Consequently, it is useful to think of this model as “demand driven.”

The model is developed by identifying the key determinants of GNP demand. The starting point is the national income identity, which states that

$$GNP = C + I + G + EX - IM,$$

that is, the gross national product is the sum of consumption expenditures ( $C$ ), investment expenditures ( $I$ ), government spending ( $G$ ), and exports ( $EX$ ) minus imports ( $IM$ ).

Note that the identity uses GNP rather than GDP if we define  $EX$  and  $IM$  to include income payments, income receipts, and unilateral transfers as well as goods and services trade.

We rewrite this relationship as

$$AD = C^D + I^D + G^D + EX^D - IM^D,$$

where  $AD$  refers to aggregate demand for the GNP and the right-side variables are now read as consumption demand, investment demand, and so on. The model further assumes that consumption demand is positively related to changes in **disposable income** ( $Y_d$ ). Furthermore, since disposable income is in turn negatively related to taxes and positively related to transfer payments, these additional variables can also affect aggregate demand.

The model also assumes that demand on the current account ( $CA^D = EX^D - IM^D$ ) is negatively related to changes in the domestic real currency value (i.e., the real exchange rate) and changes in disposable income. Furthermore, since the domestic real currency value is negatively related to the domestic price level (inflation) and positively related to the foreign price level, these variables will also affect current account demand.

Using the G&S market model, several important relationships between key economic variables are shown:

- When government demand ( $G$ ) or investment demand ( $I$ ) for G&S rises (falls), equilibrium GNP rises (falls).
- When disposable income rises (falls) due to a decrease (increase) in taxes or an increase (decrease) in transfer payments, equilibrium GNP increases (decreases).
- When the real exchange rate depreciates (appreciates), either due to a depreciation of the nominal exchange rate, an increase in the domestic price level, or a decrease in the foreign price level, equilibrium GNP rises (falls).

### Connections

The G&S market model connects with the money market because the value of GNP determined in the G&S model affects money demand. If equilibrium GNP rises in the G&S model, then money demand will rise, causing an increase in the interest rate.

The G&S model also connects with the foreign exchange (Forex) market. The equilibrium exchange rate determined in the Forex affects the real exchange rate that in turn influences demand on the current account.

A thorough discussion of these interrelationships is given in Chapter 9.

## Omissions

There is one important relationship omitted in this version of the G&S model, and that is the relationship between interest rates and investment. In most standard depictions of the Keynesian G&S model, it is assumed that increases (decreases) in interest rates will reduce (increase) demand for investment. In this version of the model, to keep things simple, investment is assumed to be exogenous (determined in an external process) and unrelated to the level of interest rates.

Some approaches further posit that interest rates affect consumption demand as well. This occurs because household borrowing, to buy new cars or other consumer items, will tend to rise as interest rates fall. However, this relationship is also *not* included in this model.

### Key Takeaways

- The Keynesian, or G&S, model of output determination is a demand-driven model in that the amount of national output produced by an economy is determined by the total amount demanded.
- One important relationship omitted in this version of the G&S model is the lack of a relationship between interest rates and investment.
- The main results from the G&S model are the following:
  - When government demand ( $G$ ) or investment demand ( $I$ ) for G&S rises (falls), equilibrium GNP rises (falls).
  - When disposable income rises (falls) due to a decrease (increase) in taxes or an increase (decrease) in transfer payments, equilibrium GNP increases (decreases).
  - When the real exchange rate depreciates (appreciates), either due to a depreciation of the nominal exchange rate, an increase in the domestic price level, or a decrease in the foreign price level, equilibrium GNP rises (falls).

### exercise

1. **Jeopardy Questions.** As in the popular television game show, you are given an answer to a question and you must respond with the question. For example, if the answer is “a tax on imports,” then the correct question is “What is a tariff?”
  - In the Keynesian, or G&S, model, this is the primary determinant of aggregate supply.
  - Of *increase, decrease, or stay the same*, this is the effect on equilibrium GNP if government spending decreases in the G&S model.
  - Of *increase, decrease, or stay the same*, this is the effect on equilibrium GNP if investment spending increases in the G&S model.
  - Of *increase, decrease, or stay the same*, this is the effect on equilibrium GNP if tax revenue decreases in the G&S model.
  - Of *increase, decrease, or stay the same*, this is the effect on equilibrium GNP if transfer payments increase in the G&S model.
  - Of *increase, decrease, or stay the same*, this is the effect on equilibrium GNP if the domestic currency depreciates in the G&S model.
  - Of *increase, decrease, or stay the same*, this is the effect on equilibrium GNP if the domestic price level decreases in the G&S model.
  - Of *increase, decrease, or stay the same*, this is the effect on equilibrium GNP if the foreign price level decreases in the G&S model.

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