

CHAPTER TWO

THE CLASSICAL MODEL OF THE MACROECONOMY

2.1 Introduction

The Production Possibility Frontier (PPF) is a handy reminder that economic choices confront us whichever way we turn. It's always "this or that?" and "now or later?". When we forget or ignore this message, unwanted consequences often follow. But the PPF framework itself tells us little about these consequences because it doesn't reveal the underlying causes of unemployment, inflation, the business cycle, dwindling productivity growth, volatile foreign exchange rates, soaring levels of indebtedness, and other economic disorders. So our next step, a big one that will concern us through most of the book, is to turn to **economic theory** for some insights into the linkages between our economic *choices* (private and public) and the resulting *outcomes*.

An economic theory, embodied in an **economic model**, becomes a device for predicting the consequences of alternative economic paths without having to actually journey along them. Such models are simplified representations of the much more complicated "real" world. As you will see throughout the book, a careful analytical model, intelligently used, can help us avoid the costly trial-and-error approach to economic policy making. You'll also see examples where a "bad" model turns out even worse than trial-or-error. It can act as a set of blinders that prevents us from understanding or even perceiving some of the consequences of our actions.

It's a common mistake to view "theory" as something exotic, mysterious, impractical, or inherently complicated. Economic theory is the "bridge" from choices to outcomes. It connects *if with then, cause with effect*. Therefore it is exactly the same kind of process that we engage in every day just to get through the ordinary business of life—looking for *connections, patterns, and inter-relationships*. Those who claim to dislike "theory" probably misunderstand it. Avoidance of theory and models is often defended as a way to be "practical", "let the facts speak for themselves" and "get to the bottom line". But this so-called "common sense" attitude ensures a superficial understanding of complex situations and often leads to decisions and policies that waste scarce resources. The many examples and discussions of economic policy throughout this book should convince you what is merely asserted now: Effective choices—private or public—must have a foundation in an understanding of cause-and-effect linkages. In other words, good practical choices *start* with a good theory.

But what happens in situations where two or more theories seem to make sense? How do we choose among them? What if the available evidence is consistent with several different explanations? Do we then pick according to hunch or other subjective criteria, flip a coin, or just remain agnostic? We'll explore this important issue later when you have a solid working knowledge of basic macroeconomic analysis. In this chapter we take a first look at the two major theoretical bridges between choices and outcomes in macroeconomics—the **Keynesian** and **classical** models. Though similar in most respects, they differ in a few telling ways. These differences, examined with increasing precision in later chapters, have created most of the controversy and stimulated much of the progress in macroeconomics over the past 70 years.

2.2 Macroeconomics & the Keynesian Tradition

It was not until the 1930s that macroeconomics emerged as a separate field within economics. Befitting its birth during the depths of the Great Depression, it has remained decidedly policy-oriented. The prominent British economist **John Maynard Keynes** (it rhymes with "brains", he would say) identified *unemployment* as a vital issue about which mainstream economics of that time, which he called classical economics, had too little to say. In his influential book, *The General Theory of Employment, Interest, and Money* (1936), Keynes claimed to have discovered a policy mechanism for ending unemployment and stimulating overall economic activity.

The "Keynesian Revolution" means different things to different people. But even its critics have agreed that Keynes's *General Theory* triggered a series of analytical innovations and policy experiments that resulted in dramatically higher expectations about the government's ability to favorably influence overall economic performance. Over half a century later the very practical, applied focus of **Keynesian economics** remains strong. Keynes's vision of an active policy role for government in guiding and stabilizing the economy is now so widely accepted in practice that it's hard to imagine how radical it was in 1936. Most of us take it for granted that the Federal government should respond quickly and appropriately to signs of a weakening economy, though we may disagree over the specifics and extent of that action. Our perspective is reflected in and reinforced by the news media's close attention to macroeconomic issues. Inflation, recession, and the latest round of outsourcing; taxes, deficits, and the national debt; interest rates, Federal Reserve policies, the international value of the dollar, and the rate of growth of economic activity—all are newsworthy items for which we hold our governments accountable. Candidates for public office are expected to tell a convincing story about how they will use government power to improve the situation, whereas their opponent's schemes will only make things worse.

The appeal of **policy activism** is powerful even though experience has shown that the government's ability to control the macroeconomy is probably much more limited than is popularly believed. This tendency to look to the government for solutions to macroeconomic issues is due, in part, to some dramatic past successes but perhaps also to a need to believe that we can control our economic destiny. It has fostered levels of government involvement in the U.S. economy that would have been unthinkable in earlier decades and has also created strong resistance from those who fear such concentration of power. Reaganomics and Thatcherism, for example, were movements to reverse the activist influence that is in part a legacy of the work of John Maynard Keynes. Were he alive today, however, this change in the role of government and the ongoing controversy it continues to generate would not surprise the man who wrote that:

" . . . the ideas of economists and political philosophers, both when they are right and when they are wrong, are more powerful than is commonly understood. Indeed the world is ruled by little else. Practical men, who believe themselves to be quite exempt from any intellectual influences, are usually the slaves of some defunct economist. Madmen in authority,

*who hear voices in the air, are distilling their frenzy from some academic scribbler of a few years back.*¹

In alerting us to our dependence on ideas and slogans from the past, Keynes was also foretelling the future of Keynesian economics. Many of his ideas, even some that have not held up to careful scrutiny, continue to hold us in their grip.

2.3 THE CLASSICAL TRADITION IN MACROECONOMICS

Though macroeconomics as a separate branch of economics is relatively young, there is a long history of theories and policies about such vital issues as prosperity and depression, inflation, and the economic role of government. The most prominent and enduring of these earlier theories is known as **classical economics**—the focus of Keynes's attack in *The General Theory*. The policy implications of Classical economics are in stark contrast to the activism of Keynes and his followers. For more than 150 years following the publication of **Adam Smith's** masterpiece, *The Wealth of Nations* (1776), most political economists, moral philosophers, and policy makers held the belief that the workings of private enterprise and the market system, unfettered by much direct governmental involvement, was the best prescription for overall economic health. Smith's famous "invisible hand" metaphor describes how individual self-interest is translated by a competitive market system into a coherent, efficient, and stable outcome for the whole nation.² There was no need, in the classical view, for a distinct field concerned with aggregate or *macroeconomics*.

At the onset of the Great Depression, the classical perspective dominated economic thinking in Western industrial nations. It advocated a limited but still very important role for the public sector. First, and most importantly, the government must set up and enforce the basic **institutional structure** (such as private property, enforcement of contracts, and prevention of monopoly power) around which a market-oriented economy revolves. This vital role has become increasingly appreciated as we watch the nations of the former Soviet Bloc struggle to lay institutional foundations consistent with a market system. Secondly, the classical tradition envisions the government as **provider of a limited number of public goods and services** (national defense, highways, and education made Adam Smith's list) to be paid out of *current* taxes except in national emergencies (namely wars) when temporary borrowing was acceptable.

¹ John Maynard Keynes, *The General Theory of Employment, Interest, and Money* (London: Macmillan Publishing Company, 1936), p. 383.

² "As every individual . . . endeavours as much as he can both to employ his capital in the support of domestic industry, and so to direct that industry that its produce may be of the greatest value; every individual necessarily labours to render the annual revenue of the society as great as he can. He generally, indeed, neither intends to promote the public interest, nor knows how much he is promoting it. By preferring the support of domestic to that of foreign industry, he intends only his own security; and by directing that industry in such a manner as its produce may be of the greatest value, he intends only his own gain, and he is in this, as in many other cases, led by an invisible hand to promote an end which was no part of his intention. Nor is it always the worse for the society that it was no part of it. By pursuing his own interest he frequently promotes that of the society more effectually than when he really intends to promote it. I have never known much good done by those who affected to trade for the public good." (Adam Smith, *An Inquiry Into the Nature and Causes of the Wealth of Nations*, Glasgow ed. of the *Works and Correspondence of Adam Smith*, [Oxford: Oxford University Press, 1976 (1776)], 1:456.

This limited direct role for government had deep roots in the abundant historical evidence of abuse of concentrated political and economic power by governments. That this power would typically be used to reward friends and punish enemies was taken as self-evident. In fact, deep mistrust of government remains widespread and often coexists in our minds side-by-side with its opposite—a naive faith that government action can and should solve all our economic problems. It's no wonder that we find the "role of government" issue so perplexing and so frustrating.

This general aversion to direct economic participation by the government is echoed and reinforced by the classical theory of how a market economy functions. With only a small handful of exceptions (national defense, highways, etc.), public sector actions to promote economic prosperity are doomed to failure according to the classical analysis. At best, government involvement is ineffective; at worst, it can impede the "engine of economic growth" which resides in the private sector and is powered by the incentives of private property and competitive markets.

This classical theory of limited government effectiveness, reinforced by abuses of public power throughout recorded history, came to dominate economic policy-making in the industrialized countries for most of the 19th and early 20th Centuries. Though the classical model was often criticized, most notably and severely by Karl Marx, it was never seriously challenged until the publication of Keynes's *General Theory*. Keynes and his followers were the first to provide a substantive and careful counter-alliance of facts and theory to rival the authority of the orthodox classical view.

WHO'S RIGHT? KEYNES or the CLASSICS?

The two views differ markedly in their picture of how the macroeconomy functions and what the government can and cannot accomplish. It would seem that we could simply look at the facts and decide who's right and who's wrong. Is it the Keynesian or the classical view that best describes economies at the end of the 20th Century?

This seemingly straightforward question turns out to be both too involved and too important for us to tackle in a responsible way at this point. By the end of this chapter you should begin to see why. By the end of Chapter Fifteen you will have the background and analytical skill to carefully assess the two central and distinct questions defining the Keynesian and classical traditions: What *can* the government do? and What *should* the government do?

The *General Theory* was written in the midst of the Great Depression, a time when many were proclaiming the fulfillment of Karl Marx's prediction that class conflict would lead to the inevitable destruction of capitalism and the abolishment of private ownership of economic resources. Keynes rejected the Marxian diagnosis along with the passive optimism of the classical tradition. The abolition of private property in favor of state ownership was repugnant to Keynes. But, in his view, the mechanism underlying the classical "invisible hand" was much too

weak to sustain prosperity in a growing industrial nation. Keynes thought that an expanded and active economic role for government was needed to maintain a healthy macroeconomic environment within which free enterprise and a market economy could flourish. A fair and thoughtful assessment of this view requires us to begin with a clear understanding of the classical model.

2.4 ELEMENTS OF THE CLASSICAL MODEL

To speak of *the* classical model is an obvious distortion since no single framework can encompass all economists working in the classical tradition for more than two centuries. Variations continue to arise and sometimes the differences are significant enough to warrant a new label like "Neoclassical", "Austrian", or "New classical". But from our present vantage point, what is most striking is the *similarities*, not the differences. There is a remarkable continuity in the classical tradition that extends over the centuries right down to the present. It is these similarities that are embodied in the representative classical model of this chapter.

Any model of a market-oriented economy must go beneath all the noise and commotion on the surface of economic life to the underlying forces that power and guide the system. The classical model is built around two basic elements: the process of **market clearing** in competitive markets and the **Quantity Theory of Money**. Together they define a set of activities and interactions designed to represent (that is, simulate or approximate) the workings of a real world, market system.

The classical system describes a process in which *competition* and *self-interest* "control" economic activity in much the same way that a thermostat controls temperature. A smoothly operating classical world is one in which "market clearing" insures that the thermostat is set on full employment. Moreover, the "Quantity Theory", as we'll see, yields a clear and simple policy for price stability: let the money supply grow at approximately the same rate at which the full employment level of output is expected to grow. These two characteristics—automatic full employment and a simple rule for achieving price stability—make this model sound almost irresistible. The obvious question is whether the "model" bears much resemblance to the "real world" in which we live.

The classical tradition contends that such a model presents a reliable picture of the actual workings of the macroeconomy and that its policy conclusions follow logically from its analytical insights. Keynes, as we have seen, believed the classical model to be a *misrepresentation* of reality. Its thermostat, in his view, was unreliable and the government had both the ability and the obligation to alter the setting or over-ride the mechanism altogether. To understand the Keynesian remedy (and its limitations) we must first understand the classical theory (and its limitations).

Market Clearing

The adjustment process of a market system, called "market clearing", lies at the heart of the classical model. The emphasis is on the interplay and resolution of market forces through price and quantity adjustments in competitive markets. The familiar graphs in Figure 2.1 portray

hypothetical supply and demand curves, representing the preferences and interactions of buyers (demanders) and sellers (suppliers). The downward slope of the demand curve (D) reflects the observation that when the price (p) of the commodity falls, other things the same, quantity demanded (q^d) will rise as individuals increase their purchases of this now relatively cheaper good. Any other event that changes the amount purchased—such as a change in income or in consumer preferences—will shift the entire curve, leaving the slope unchanged. The upward-sloping supply curves (S) in Figure 2.1 show that as the price of the good rises (other things the same) quantity supplied (q^s) increases as sellers step up production of this now relatively more profitable good. Any other event that changes the amount produced—such as a change in the cost of inputs, new taxes, or environmental restrictions—will shift the entire curve. *In short, all factors that affect buyers are incorporated either in the slope or the position (intercept) of the demand curve (D); all factors that affect sellers are captured in either the slope or intercept of the supply curve (S).*

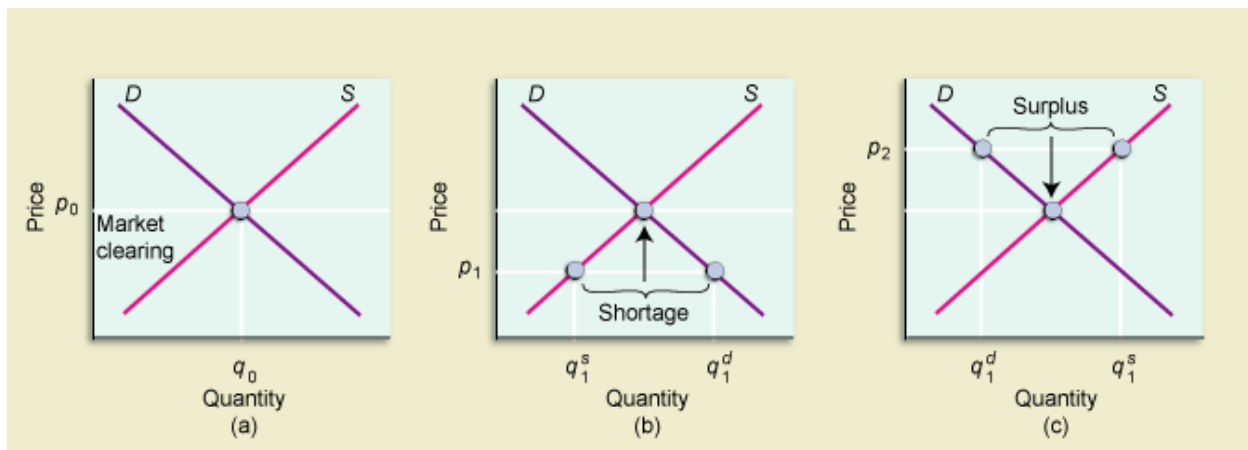


Figure 2.1 Basic Mechanics of Supply and Demand

The basic supply and demand diagram essentially brings buyers and sellers together and demonstrates how their ensuing interactions can lead to a resolution (equilibrium) of conflicting interests. For example, in Figure 2.1(a) the price of the commodity is p_0 and the quantity traded is $q^d=q^s=q_0$. This is the only point at which the two curves intersect, meaning that it's the only market price at which the decisions of buyers and sellers are consistent. It doesn't mean that either party is necessarily pleased with the price. Buyers will always like it lower, sellers higher. But this is the only price that is acceptable to both. When there is neither **surplus** ($q^s>q^d$) nor **shortage** ($q^d>q^s$) at the prevailing price, the market is said to be **cleared**.

Suppose the initial price is *below* the market clearing level, at p_1 in Figure 2.1(b). Compared to the first picture, buyers will now demand more than q_0 but sellers will supply less. Therefore p_1 results in a *shortage* of the amount $(q_1^d-q_1^s)$. As long as there are no restrictions (legal or otherwise) fixing the price at p_1 , this shortage will create an upward pressure on the price. Buyers unable to get as much as they want at this price will, in effect, bid up the price to entice sellers to increase their production—both sides merely following the dictates of their own self-interest. As p_1 rises, some buyers drop out of the market at the same time as some sellers are expanding production. Together these reactions reduce the gap between the quantities demanded and supplied. With stable (non-shifting) supply and demand curves, this upward

pressure continues until the price has risen to its equilibrium level. Only at p_0 will the shortage disappear.

What if the price is *above* the market clearing level, as shown by p_2 in Figure 2.1(c)? Suppliers respond by producing q^s_2 , whereas buyers demand only q^d_2 . As long as prices are free to adjust, the resulting *surplus* ($q^s_2 - q^d_2$) generates downward pressure on the price as sellers compete for buyers. As the price falls, suppliers cut back on production levels and the surplus diminishes and finally disappears when the price reaches p_0 and the market is again cleared.

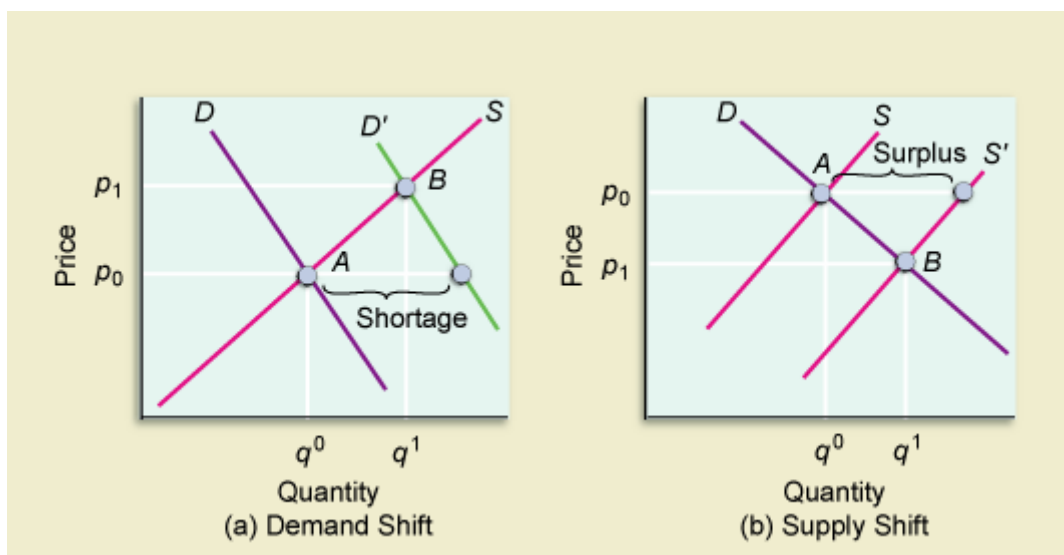


Figure 2.2 Market Responses to Shifting Demand & Supply

This framework—supply, demand, and market clearing—is the most basic and frequently used of all economic models. It offers a simple, reliable way to describe and predict market events and interactions. For example, suppose we're at point A in Figure 2.2(a) when an increase in demand for this good occurs. D shifts to D' and the initial price (p_0) no longer clears the market. This demand shift has created a shortage which forces the price upwards as more buyers compete for the available supply. Only when the price reaches p_1 , at point B, will the market again clear. Figure 2.2(b) shows how a positive supply shift (S shifts out to S') creates a surplus. Market clearing is restored only when the price falls to p_1 , as the economy adjusts from point A to B.

IN SUMMARY . . . MARKET CLEARING

Three simple assumption—demand curves slope down, supply curves up, and prices adjust automatically until markets "clear"—lie at the heart of much economic analysis. They form our most basic model of prices and quantities and the conditions under which they change.

The market clearing price can change only in response to a shift in demand or supply. Moreover, the market clearing price represents a stable equilibrium. Any disturbance of price from p_0 will set in motion events that, for given supply and demand curves, return price to its original market clearing level. The market mechanism—responding to the dictates of self-interest of its participants—works automatically (as if controlled by an "invisible hand") to maintain or restore the equilibrium price.

We assume for now that when a shift in demand or supply occurs, the price adjust "quickly" to its market clearing level. The actual speed of price adjustment is a controversial issue that will be examined more carefully in later chapters.

From Labor Market Clearing to Aggregate Supply

Much of the appeal of supply and demand analysis stems from its remarkable versatility. It can be usefully applied to virtually any type of exchange. Though never the "whole truth", it almost always yields important insights that are difficult to see in any other way. Our present interest in the classical view of the automatic functioning of the macroeconomy leads us to examine the workings of supply and demand in the so-called **labor market**. The demand for labor services by employers and the supply of these services by workers are brought together by market forces, thereby determining the real wage ("price" of labor) and the number of hours worked ("quantity" of labor).

Starting with supply, we ask what happens to the *quantity of labor supplied* (denoted by n^s) as the *real wage* rises? Letting W denote the "money wage" (such as \$7.50 per hour) and P the average price of goods and services (as measured, for example, by the Consumer Price Index), then W/P represents the purchasing power or real value of the money wage. As this **real wage** rises, some potential workers who did not seek jobs before are now attracted to the labor market by the higher earnings. In addition, the higher real wage will induce some currently employed workers to work overtime or take a second job.³

This is illustrated by the upward sloping labor supply curve, n^s in Figure 2.3, which says that as the real wage rises, total hours worked also increase. Note that a change in the real wage can come from either a change in the money wage (ΔW) or a price level change (ΔP).

³ At the same time, some workers may decide to work *fewer* hours, essentially taking this pay raise in the form of more leisure rather than higher income. Statistical evidence confirms that the *net* economy-wide effect is a relatively small increase in total labor supply when the real wage rises.

But if, for example, both the price level and the money wage rate double, there is no change in labor supply since the *real* wage is unchanged (that is, $W_0/P_0 = 2W_0/2P_0$). This characteristic of the labor supply curve is sometimes described as the absence of "money illusion" by workers. They respond to changes in the purchasing power not just the nominal value of their wages.⁴ In macroeconomic policy making—especially prospects for smoothing the ups and downs of the business cycle—a lot depends on *which* specific events do and do not influence the labor supply relationship. Our initial working hypothesis of an *upward sloping labor supply curve with no money illusion* is the classical benchmark from which later variations depart.

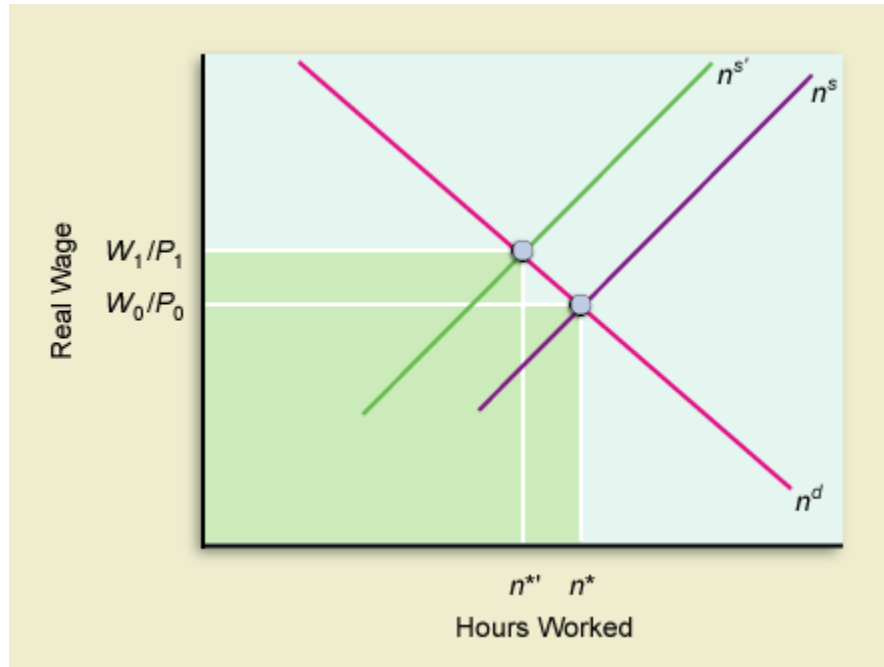


Figure 2.3 Supply & Demand in the Labor Market

On the demand side, the downward sloping labor demand curve, n^d in Figure 2.3, embodies the well-established and common sense notion that a rise in the real wage (other things the same) leads firms to cut back employment as they substitute capital for labor. Again we assume that it is the *real* wage, not the money wage, that matters—this time to the firm, earlier to the worker. One way to think about this is that P represents the average price of output in the economy. So the typical firm will be concerned with changes in the money wage it *pays* (W) relative to the price it *receives* (P) for its output. If both W and P should double, this firm is assumed to continue to demand the same amount of labor.⁵

⁴ But what if some workers actually *do* respond solely to changes in the money wage (ΔW) and ignore, at least initially, what's happening to the price level (ΔP)? They are said to have *money illusion*, an "affliction" that has played a large role in the debate between classicals and Keynesians. This issue will be explored in Chapter 8.

⁵ As with labor supply, further discussion of the factors underlying the slope and shifts of the labor demand curve is postponed to Chapter 8.

For given labor demand and supply curves, a market clearing real wage occurs at their intersection, such as point A in Figure 2.3. **Full employment**, in this context, means that all who want jobs at the going real wage (as shown by the labor supply curve) will be hired (demanded) by firms. Assuming that real wages adjust to clear the labor market, shifts in labor supply or demand lead to new market clearing levels of the real wage and hours worked. For example, a decrease in labor supply will shift labor supply to n^s in Figure 2.3 and create a new market-clearing, full employment equilibrium at point B.

In Chapter 1 we said that the production process, as summarized in the production function, converts labor (n), capital (k), and technology (tn) for a given institutional structure (i^{nst}), into final goods and services (y). When the labor market is in equilibrium (or cleared) the economy will be at full employment and we can write this as:

$$y^* = F(n^*, k_0, tn_0, i^{nst}_0),$$

where k_0 is the fixed level of capital (including natural resources as well as plant and equipment, among other inputs), tn_0 is the current level of technology, i^{nst}_0 refers to a given institutional structure while n^* and y^* are, respectively, the full employment levels of employment and output.

Suppose we want to determine how a change in the price level will affect the level of real output in an economy with a fixed capital stock and given institutional structure. The production function above makes it clear that the only remaining way for output to change is through a change in the labor input (n). If a change in the price level is to influence the level of real output it will have to be through the labor market.⁶

So let's use some basic market mechanics to see what effect, if any, a change in the price level has on the labor market. The initial impact of a price level change is obviously to change the real wage which, in turn, will affect *both* labor demand and supply. Turning to Figure 2.4, suppose we start at the full employment, market clearing equilibrium of point A. If the price level were to suddenly double, the real wage would fall from W_0/P_0 to $W_0/2P_0$, as shown. The declining real wage means a reduction in the quantity supplied of labor, moving us down the labor supply curve. At the same time it will stimulate the demand for labor, moving us down the labor demand curve as well. The result is a labor shortage, portrayed as the gap between the two curves at the lower real wage, $W_0/2P_0$.

⁶ Holding the levels of the non-labor inputs (capital and the institutional structure) constant not only simplifies the analysis but seems to be realistic for a good many macroeconomic issues. But when we turn to longer run issues (such as economic growth) we will allow all the inputs to vary with whatever events or policies are being considered.

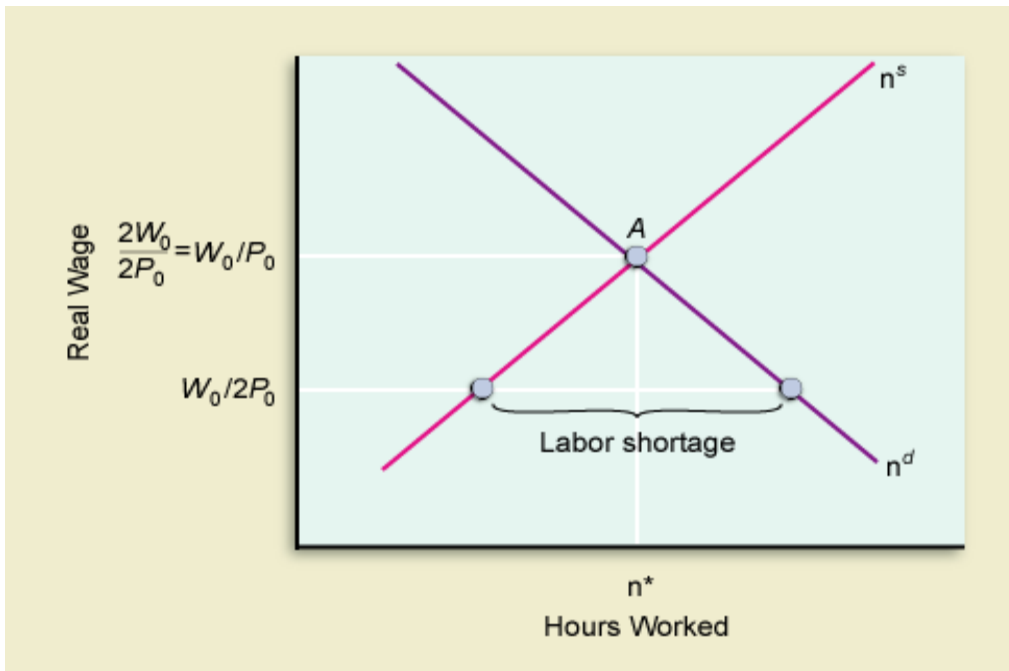


Figure 2.4 Temporary Labor Shortage from an Increase in the Price Level

Starting at point A, a doubling of the price level will reduce the real wage ($W_0/P_0 \rightarrow W_0/2P_0$), creating a temporary labor shortage. The resulting excess demand for labor (at $W_0/2P_0$) puts upward pressure on the money wage until the shortage is eliminated ($W_0 \rightarrow 2W_0$).

This shortage—just like the one shown earlier in Figure 2.1(b)—puts upward pressure on the price (W/P in this case). So assuming the price level stays at $2P_0$ this forces a rise in the *money wage*, $+\Delta W$. In fact, market clearing insures that the money wage must *also* double in order to eliminate the labor shortage. So the real wage will have returned to its original level ($2W_0/2P_0 = W_0/P_0$) and we'll be right back at point A with a higher price level, a proportionately higher money wage, but the same real wage and quantity of labor (n^*).

The end result is that a doubling of the price level does *not* alter equilibrium in the labor market because neither suppliers nor demanders of labor had "money illusion". They focused on the real wage, not the money wage, in making their labor market decisions. And because changes in the price level don't change the level of employment in the classical model they will have *no* impact on the level of real output. This is captured in the **classical aggregate supply curve (AS^{*})** shown in Figure 2.5. It is this curve—vertical at the full employment level of output—that *defines* full employment in the classical model. It plays the same role of portraying the limits imposed by scarcity that the Production Possibility Frontier (PPF) did in our earlier setting.

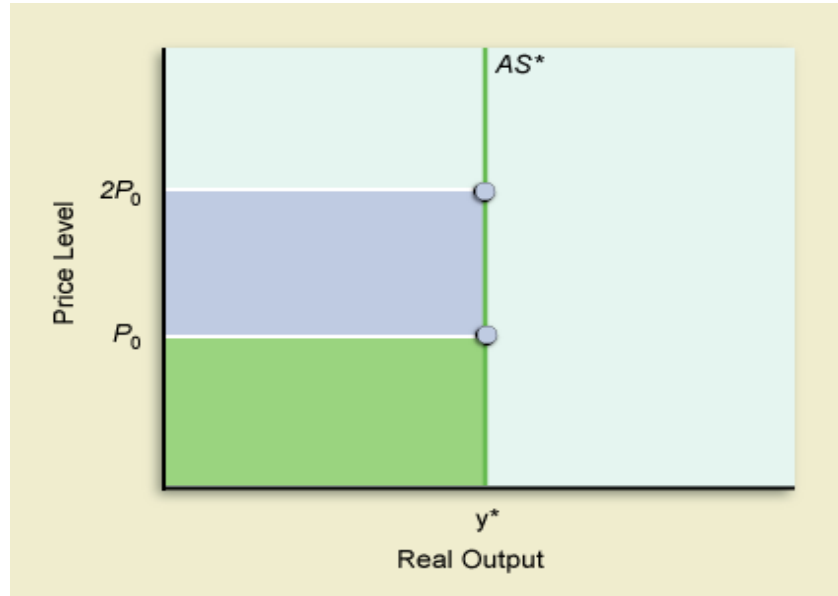


Figure 2.5 Classical Aggregate Supply Curve (AS*)

For a given capital stock, technology, and institutional structure, the process of market clearing keeps equilibrium real output always at full employment. Changes in the price level are met with equiproportionate changes in the nominal wage, leaving the real wage, employment (hence, real output) unchanged.

IN SUMMARY . . . Aggregate Supply

The classical aggregate supply model applies basic supply and demand analysis to a competitive labor market with flexible wages and no "money illusion" to tell the story of an economy that adjusts automatically to full employment. A situation in which actual output (y) deviates from its full employment level (y^*) is viewed as exceptional and short-lived. This is because flexible wages and prices allow market clearing to keep employment close to its full employment level, n . It is this mechanism that makes the classical aggregate supply curve (AS^*) vertical.

The "thermostat" of market-clearing is set to keep the economy at full employment and therefore on its Production Possibility Frontier. This is the "invisible hand" idea and the classical presumption is that whichever metaphor you choose—hand, thermostat, magnetism, or gravity—it is strong enough to keep the economy from straying very far or for very long from full employment. No government action, other than insuring competitive markets, is required.

and in prospect . . . Aggregate Demand

While the labor market and aggregate supply determine employment and output, they have told us nothing about what determines the price level. For this, we need to supplement the analysis with a theory of aggregate demand.

From the Quantity Theory of Money To Aggregate Demand

If market clearing is the cornerstone of classical aggregate supply, the **Quantity Theory of Money** plays the same role in aggregate demand analysis.⁷ The Quantity Theory relates the price level to the quantity of money circulating in the economy. It leads to a theory of aggregate demand (AD) which, combined with the market clearing model of aggregate supply (AS^*), tells the classical "story" of the workings of the macroeconomy. The classical AD/ AS^* model, as we'll refer to it, is an explanation of the levels of output, employment, and the price level in a market system. This section presents the demand side and the next will combine it with supply to complete the classical macroeconomic model.

Aggregate demand is another name for total spending on goods and services. And spending can change either because of a change in the *quantity* (or *real value*) of goods we purchase (denoted by y^{AD}) or a change in the *average price* (P) we pay for these goods. This definition of total spending, also called *nominal* aggregate demand, can be written as:

$$\text{Total Spending} = \text{Nominal Aggregate Demand} = Py^{AD}.$$

Note that if we divide all three parts of this expression by the price level (P), real demand (y^{AD}) equals nominal aggregate demand (or total spending) *deflated* (divided) by the price level. The point here is to separate changes in total spending, $\Delta(P \cdot y^{AD})$, into price change (ΔP) and quantity change (Δy^{AD}).

Since spending entails the use of *money*, this gives us a second and equivalent way to express total spending or nominal aggregate demand. Total spending is equal to the available **money supply** (M), the number of dollars in circulation, *times* the **velocity of money** (V), the number of times that the *average* dollar changes hands during a particular time period. Combining these two equivalent measures of total spending, we have:

$$Py^{AD} = \text{Total Spending} = MV.$$

The above equation states that the total amount spent on goods and services (Py^{AD}) must equal the amount of dollars available (M) times the average speed at which they circulate through the economy (V) during, say, a particular year. It provides the foundation for an explanation of the real demand for output, y^{AD} . Dividing both sides by P , we have:

$$y^{AD} = MV/P.$$

An equation can be thought of as a sentence about relationships and balance. This one says that aggregate real demand for output varies *directly* with changes in either the amount of

⁷ While hints of the Quantity Theory go far back in history, it is most often associated with the work about 250 years ago of the Scottish philosopher, David Hume. The American economist Irving Fisher gave it its present form early in this century and Milton Friedman is largely responsible for its modern revival among Monetarists..

money or its speed of circulation (M and V , respectively) but *inversely* with the average level of prices (P). Most of us find it easier to remember short equations than sentences like the last one. So one important use for mathematics in economics is as a convenient shorthand for describing and remembering key relationships like the Quantity Theory of Money : $y^{AD} = MV/P$.

Let's first focus on the inverse relationship between the real demand for output and the price level. As the price level falls (other things the same), y^{AD} will rise—a result that is simply common sense. If we spend a given amount of money (M) at a constant rate (V), a fall in the average price ($-\Delta P$) must increase the total amount ($+\Delta y^{AD}$) we can buy. This relationship between the demand for output and the price level (geometrically, a rectangular hyperbola) is captured in the downward slope of the **classical aggregate demand curve (AD)** in Figure 2.6. As the price level changes, we move along the aggregate demand curve. So by design we're building the impact of a changing price level into the *slope* of the aggregate demand curve. Anything else that changes aggregate demand must *shift* the entire curve in or out. From the demand equation, $y^{AD}=(MV)/P$, we see that only two events can cause shifts in the aggregate demand curve—a change in the supply of money (ΔM) or a change in its velocity (ΔV). We assume for now that the money supply is completely controlled by the Central Bank. In other words, M is a **policy instrument** that could become a source of instability in aggregate demand only if the Central Bank (the Federal Reserve in the U.S.) chooses a volatile, stop-and-go time path for the money supply. Let's presume, for now, that they do not.

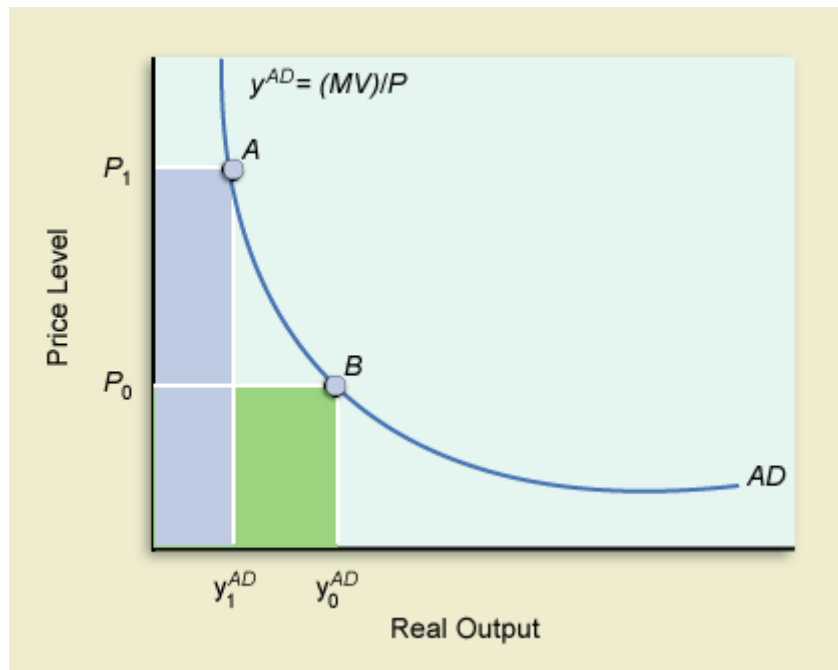


Figure 2.6 Classical Aggregate Demand Curve

For a given supply of money and velocity of money, the demand for real output must vary inversely with the price level, shown as the movement from points A to B.

What about the stability of the velocity of money? Unlike the money supply, velocity is not controlled by policy-makers. The rate at which dollars change hands is the outcome of literally trillions of economic decisions each year, by anyone, anywhere in the world, who uses

dollars—individuals, businesses, and governments alike. To discuss even the relative handful of the most important determinants of velocity could obviously prove lengthy and involved. It is highly convenient, then, that the basic *long run* facts about movements in velocity can be captured with a very simple, almost superficial, theory. The classical Quantity Theory of Money typically assumes that velocity can be considered a constant over relatively long periods of time. Is such a strong assumption reasonable? Statistical evidence is generally clear on this point—while velocity often fluctuates substantially from year-to-year, these ups and downs have usually offset one another over longer periods of time. In a later chapter we will look more carefully at long run trends in velocity. For now we'll just accept the classical approximation that the velocity of money can be treated as a constant.

The classical tradition contends that the assumption of constant velocity, when combined with actual monetary actions of Central Banks and the market-clearing adjustments that lead to a vertical aggregate supply curve, paints a faithful, broad-brush picture of observed economic activity in market-oriented economies. Specifically, this portrait is one of *long run equilibrium at full employment*, overlaid with *short-lived, disequilibrium fluctuations* around full employment, and punctuated by the *occasional panics and crises*, attributable either to irresponsible Central Bank manipulation of the money supply or the inevitable Acts of God or man (like earthquakes or wars) that take their toll on any economic system.

IN SUMMARY . . . Aggregate Demand

The classical aggregate demand curve displays an inverse relationship between the price level and the real demand for output in an economy with a given money supply and constant velocity of money. Changes in M shift aggregate demand; changes in P are movements along the curve.

and in prospect . . . *The complete classical AD/AS* model looks past day-to-day and, on occasion, even year-to-year changes, toward those forces thought to be the enduring determinants of overall economic activity and prices. The classical tradition contends that volatile and haphazard factors in short run events tend to distract our attention from the fundamental forces and relationships that dominate economic activity and emerge only in the longer run. On this basis, it justifies the twin assumptions of market clearing and constant velocity of money.*

*Put another way, a model seeking to explain **short run events** will face two substantial challenges: (1) it must provide a theory of observed short run changes in velocity in a world in which (2) markets are not always cleared. We'll see in the next chapter that such short run models become considerably more complex than the long run classical Model.*

2.5 FOUR IMPLICATIONS OF THE CLASSICAL MODEL

Remember that a model, no matter how crude or sophisticated, is always a representation of something else. It's a *reflection* of the "real" thing and is of interest only if it is *simpler and more manageable* than its real world counterpart. At best a model is an imposter, a *good mimic*

of the original. In this section we use the classical macroeconomic model to predict consequences of hypothetical macroeconomic events or policy changes. We ask "*What if . . . ?*" and let the logic of the model respond with "*Then . . .*".

More specifically, we now look at four major implications of the classical Model: (1) Full employment prevails; (2) Aggregate demand has no impact on output or employment; (3) Supply is the key to economic growth; and (4) Inflation is a result of the actions of the monetary authority. The section following this will then consider, in an informal and preliminary way, how faithfully these implications echo the sound of the real world.

1. Full Employment Prevails!

Classical theory combines the vertical AS^* curve (which assumes market clearing) with the downward-sloping AD curve (derived from the long run Quantity Theory) to form a model of output and the price level. Output in this model can be in equilibrium only at full employment (y^*). If the price level is too high for market clearing, there will be *excess supply* (a surplus) which leads to price cutting until an equilibrium price level is reached and the market clears. A similar story holds for an *excess demand* (shortage) when the price level is below equilibrium. The "thermostat" is in control, insuring that the economy stays at or near its full employment level of output, as shown in Figure 2.7.

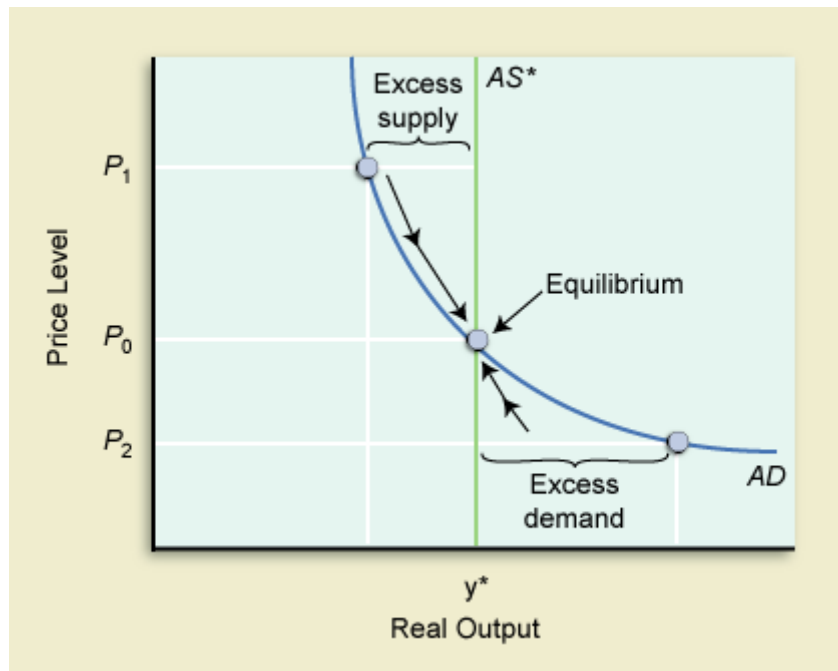


Figure 2.7 Equilibrium is Always at Full Employment

There is nothing subtle about this implication. The model is obviously constructed (contrived, some would say) to yield equilibrium only at full employment. How does it explain periods of recession ($y < y^*$) when the economy is inside its PPF? In a nutshell: as unfortunate, inevitable, but thanks to automatic market adjustments, temporary. Unemployment is said to be

a "disequilibrium phenomenon" in this model.

There have always been doubts and misgivings about this implication. It's an obvious target for criticism and even parody. Keynes's critique of automatic full employment equilibrium is certainly the best known as well as the most forceful, and we'll examine it in the next two chapters. But there is a long history of earlier theories (including one by Thomas Robert Malthus of population dynamics fame) that were variously termed "over-production", "under-consumption", or "over-saving" hypotheses. While differing in specifics, they all concluded that in a market system total demand may not be large enough to buy the entire full employment level of production. According to these theories there may be too much saving (too little spending) to purchase the full employment amount of goods and services. The result of this over-production is a subsequent cutback in output levels so that some workers will be fired and unemployment will rise. Loss of jobs means a further drop in income and hence spending and the situation continues, perhaps even worsening. The automatic adjustment of prices and wages, stressed by the classicals, cannot correct the under-spending problem because falling wages only reduce spending further. Consequently, unemployment cannot just be dismissed as a short-lived disequilibrium phenomenon.

HOW MUCH UNEMPLOYMENT AT "FULL" EMPLOYMENT?

THE *NATURAL* RATE OF UNEMPLOYMENT

Not mentioned in our discussion so far is the fact that there is unemployment at "full employment". This **natural rate of unemployment** (denoted by U^*) has two broad categories. The first is frictional unemployment and refers to those who are temporarily between jobs and will soon fill an available job vacancy. The second is structural unemployment and includes the long term or "hard core" unemployed. These groups are discussed carefully in Chapter 11, "Unemployment." Even an economy operating at full employment will have a certain percentage of its labor force out of work. For the U.S. economy today, U^* is thought to lie in the 5 to 6% range.

A "natural rate of unemployment" greater than zero is inevitable in any economy in which workers are free to quit and firms are free to fire them. In fact, a very low U^* is most typical of rigid and inefficient economies in which poor economic performance shows up in a very low standard of living rather than a high rate of unemployment. In these situations, even "full employment" may be at a point well-inside the country's potential PPF, reflecting a state of "hidden" unemployment.

What about those who don't fall in the frictional or structural categories, but are unemployed because the economy is currently operating below capacity? This gap between actual unemployment (U) and the natural rate of unemployment (U^*) is called cyclical unemployment and will play a central role in coming chapters.

Such criticisms strike at the heart of the classical proposition that the interplay of market forces guides the economy surely and smoothly to the efficient use of its scarce resources. The classical response has typically followed the reasoning of the French economist Jean-Baptiste Say (1767-1832). **Say's Law of Markets**, often compressed to the cryptic "supply creates its own demand", insists that in a system of competitive markets there will always be enough purchasing power generated at full employment to purchase all goods produced. The

production process itself creates exactly enough income to insure its purchase, since every dollar spent on output must also be a dollar received as income by someone. No dollars are thrown away or left lying around unclaimed.

Say's Law is far more than a footnote in the history of economic thought. It identifies a process that is critical to the success of any market system, yet is virtually invisible to the untrained eye. In nations that have forsaken planning in which the vast majority of jobs were created by the government, there is understandable anxiety about turning job creation over to an "invisible hand". Where will the millions and millions of jobs needed to reach full employment come from if no agency or commissar is there to officially define them and include them in the budget? And when the budget is tight, isn't it both necessary and fair for these planners to force older workers into early retirement to open jobs for new graduates of the high schools, technical schools, and universities? In a world of economic planning, this discarding of willing and able workers seems perversely reasonable since, after all, there are only so many jobs to go around.

Say's Law says that in a market economy the job of "job creation" occurs automatically until full employment is reached. More specifically, market clearing and Say's Law together define a process by which jobs and incomes are balanced at full employment. What makes you think there will be a job available for you when you graduate? After all, millions of new graduates went into the job market last year, millions more will flood the market this year, and so what will be left for the millions like you that will be graduating in the coming years? Where will the new jobs come from? Some space at the entry level will result from the process of retirement and promotion. But this will account for only a small fraction of the new jobs that are needed to keep the economy at full employment. Where will the rest come from? Remember the millions of people who have entered the job market over the past few years? They have been receiving income for their services and, accordingly, their consumption expenditures have risen notably since they were students. In buying cars and furniture and clothes and cribs, they are essentially transforming their newly-acquired incomes (generated by their supply of labor) into additional demand for goods and services. Hence, in Say's terms, supply creates its own demand.

Say's Law effectively silenced the view that people would consistently be unable to purchase the full employment volume of goods and services. Though the often stubborn dissenters from the classical orthodoxy weren't about to surrender, they were forced to modify their attack. Their response was that even though there may be enough income generated to purchase all the output produced at full employment, there's no reason to expect that it will all be spent on output. Specifically, there is no guarantee that all saving (non-consumption) will flow smoothly into investment or other spending.

This view points the finger at the "capital market" as a weak link in the chain connecting decisions of savers with plans of investors. We'll have more to say about this issue in coming chapters. For now we simply note that this restructured criticism does *not* invalidate the classical "equilibrium only at full employment" proposition. But it raises the possibility that such an equilibrium may be relatively slow in getting established (or re-established after a demand or supply shock) because of "frictions" in capital or other markets. In other words, this argument questions the *strength* of the magnet drawing the economy to equilibrium at full employment, but not its existence.

2. Aggregate Demand has NO IMPACT on Output or Employment!

A second implication of the classical model is that an aggregate demand shift changes the market-clearing price level, but *not* the equilibrium level of real output. This is shown by the movement from A to B in Figure 2.8. Put another way, the overall standard of living (y^*) stays constant even though the cost of living (P) rises. Demand shifts are said to have no "real" effects in this model, meaning that the equilibrium levels of output and employment are unchanged.⁸

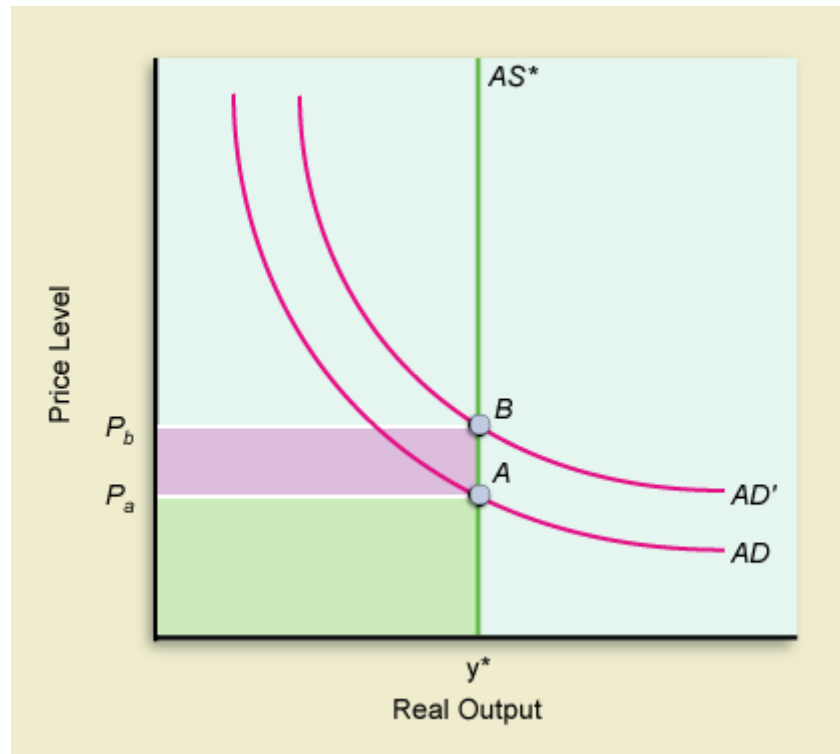


Figure 2.8 Demand Shifts Change the Price Level, Not Real Output

This simple but important implication can be stated in a variety of ways, including three common macroeconomic slogans.

"Money is a Veil"

Since an increase in the money supply shifts aggregate demand (but not supply), it follows that monetary expansion or contraction will alter only the price level, not real output. With the money supply having no impact on the standard of living, it is said to be a "veil" that is merely draped over the economy, leaving the underlying market conditions

⁸ Certainly the effects on the price level are "real" enough in every other sense of the word. But this definition of "real", which excludes price level changes, is widely used in economics and finance and, increasingly, among business journalists.

(supply and demand) and hence real economic activity undisturbed. **Monetary neutrality** is another term used to express this classical implication that monetary events don't influence "real" events. In equilibrium, expansionary monetary policy cannot raise the standard of living nor can contractionary monetary policy drive us into unemployment and recession. Note that it is a short step from this result to the policy recommendation that price stability should be the primary goal of monetary policy.

"Only Money Matters"

It may seem contradictory to say "money is a veil" in one breath and "only money matters" in the next, but both are important implications of the classical model of the macroeconomy. "Only money matters" simply says that with long run constancy of velocity, aggregate demand ($y^{AD} = MV(1/P)$) can shift only through a change in the money supply (as we saw in Section 2.4).

"Fiscal Policy is Powerless"

Like the dogs that didn't bark in the Sherlock Holmes story "Silver Blaze", the significant thing about government spending and taxing (together, fiscal policy) is that they have no impact on equilibrium output or prices in the classical model. If it seems obvious to you that an increase in government spending can't increase total productive potential (y^*), that's a good sign.⁹ For an economy at full employment, the adage that "you can't spend your way to prosperity" is certainly valid. Scarcity, the root of all economics, intervenes. To be more specific, we saw in Chapter One that an increase in government spending at full employment just transfers resources from private to public use. More public goods "crowd out" an equal value of private goods, leaving total output unchanged. Similarly, a permanent cut in taxes increases our personal spending and ends up transferring resources from other uses, typically investment, to consumption.

But what should be surprising to you is that neither an increase in government spending ($+\Delta g$) nor a reduction in taxes ($-\Delta t$) has any effect on the price level, according to the classical model. In discussing "money is a veil" we saw that printing more money didn't alter output, but definitely did push aggregate demand out and prices up. Why wouldn't an expansionary fiscal policy also shift AD to the right? There are several ways to answer this. The simplest is to note that government spending simply doesn't show up in the aggregate demand curve, $y^{AD} = MV(1/P)$. Your next question should be "Why not?". Isn't there something wrong with the classical model if it implies that expansionary monetary policy shifts aggregate demand out and increases the price level, but fiscal policy has absolutely no effect on either? Keynes certainly thought so and we'll see why in the next few chapters. But for now just note that as long as we confine our attention to long run implications, the observed constancy of velocity insures that neither fiscal policy nor anything else except a change in the money supply can shift aggregate demand. In this sense, then, fiscal policy is said to be powerless.

⁹ To the extent that the increase in government spending is spent on public capital goods there may be an effect on both AS^* and PPF. This will be relatively small and slow in coming and may be offset by other factors. Linkages between demand and supply will be discussed in later chapters.

3. Supply is the Key to Economic Growth!

Within a given institutional framework (i^{nst}_0), capital accumulation and technological innovation ($+\Delta k$), and growth in the quality and quantity of the work force ($+\Delta n^*$) are the only forces driving long run economic growth ($+\Delta y^*$). According to the classical model, economic stagnation comes from failure or inability to expand these inputs. So economic growth comes solely from shifts in aggregate supply such as that illustrated in Figure 2.9. The outward movement of AS^* forces equilibrium from point A to B as the price level falls, real output increases, and the PPF expands.

In the classical view, then, a higher level of real output is a "supply side" issue and demand stimulus simply won't help. For example, expansionary monetary policy shifts aggregate demand out, but cannot change the full employment level of output. Put another way, producing pieces of paper and naming them "money" doesn't increase our potential to produce goods and services. If it did, all nations would simply "print" their way to prosperity. Expansionary fiscal policy can have no impact on output (or even *total* demand) because it merely shifts inputs from one sector or use to another (e.g., private to public). In short, neither monetary nor fiscal policy, the two major weapons of macroeconomic policy-making, have any impact whatsoever on our standard of living since they do not alter aggregate supply. Slogans and epigrams being easier to remember than theorems or models, think of this result as a reminder that "there's no such thing as a free lunch" or that "you can't spend or print your way to prosperity."

4. Inflation is **CAUSED** by the Central Bank!

Defining **inflation** as a *continued* rise in the overall price level, we see that in the classical framework this could come either from a continuing leftward shift in aggregate supply, a continuing rightward shift in aggregate demand, or some combination of the two. Negative supply shocks do cause supply to shift left and thereby push up the equilibrium price level. Fortunately, however, we do not live in a world of negative economic growth with *continuing* leftward shifts in supply. Negative supply shocks are occasional events and often are more than offset by the capital accumulation that underlies positive economic growth.

If we can't find the continued leftward supply shifts that would cause inflation, the classical model leaves but one choice—continued growth of the money supply is the only thing that can cause an on-going long run rightward shift in aggregate demand. In other words, *inflation is always caused by the failure of the government to control the rate of growth of the money supply*. This is a remarkable conclusion and, if true, a serious indictment of Central Bankers throughout the world, past and present.

Viewed another way the classical model provides a simple policy prescription for price stability. In the long run, if the money supply increases at the same rate at which aggregate supply is growing, the equilibrium price level will not change. In other words, the Central Bank needs to control the money supply so that $\% \Delta M = \% \Delta y^*$. This would insure that both aggregate demand (AD) and aggregate supply (AS^*) shift at the same rate, leaving the equilibrium level of prices unchanged. Such a result is illustrated in the movement from A to C in Figure 2.10.

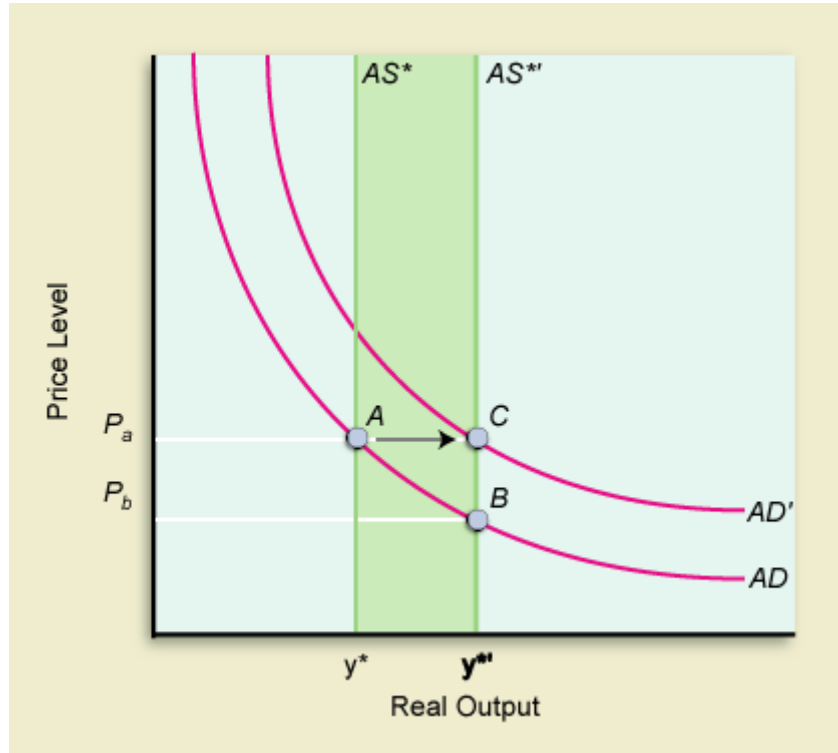


Figure 2.10 Price Stability in a Growing Economy

For the price level to stay at P_a as supply grows, aggregate demand must grow at the same rate (i.e., $\% \Delta AD = \% \Delta AS^$). In the classical model (constant velocity, hence “only money matters”), this requires that $\% \Delta M = \% \Delta Y^*$.*

2.6 SUMMARY & ASSESSMENT

Chapter One used the simple notion of the Production Possibility Frontier to display some of the ways that scarcity presents itself in the overall economy. Though useful in characterizing the many *choices* that confront us, the PPF said little about the *consequences* stemming from different choices. The present chapter began with a general discussion of “theory” as the indispensable bridge between choices and outcomes. Economic models embody that theory and provide a tool to address important policy questions. We usually think of a model as a scaled-down or simpler version of the real thing. Or it might be a purer, ideal version of reality (as in fashion models). Another metaphor may be even more useful at this point—think of a model as a device for converting questions (What if . . . ?) into answers (Then . . .).

Following a brief survey of the two major theoretical bridges in macroeconomics, Keynesian and classical, this chapter explored the workings of a macroeconomic model that captures the spirit of the classical approach. It’s important to appreciate that while the classical tradition has quite a long history, our interest in it is definitely *not* as an early artifact of primitive macroeconomics. It is very much alive today and continues to be revitalized with each successive generation of scholars. Much of the most innovative and technically sophisticated

research in macroeconomics in the past quarter century has come from within this tradition. The relatively simple classical model of this chapter is merely a starting point from which to develop the Keynesian alternative and the subsequent advances of both the New classical and New Keynesian economists. So one goal of this chapter has been to serve as a transition from the descriptive material in Chapter One to the more specific and precise reasoning that lies at the heart of macroeconomic analysis.

In the classical model we found that full employment of all resources is assured so long as prices and wages are free to adjust to their market clearing levels. We also determined that the long run position of aggregate demand in the classical model is firmly in the hands of the Central Bank ("only money matters"). Because of the vertical aggregate supply curve, however, this control translates into power over the price level rather than real output ("money is a veil"). This result, called "monetary neutrality", is central to the classical view. Rapid growth of the money supply cannot enrich the economy, it tells us. Monetary policy is neutral with respect to real output (y), though definitely anything but neutral with respect to the level of prices (P). The responsibility for inflation in a classical world lies squarely with the Central Bank.

Changes in the level of government spending or taxes (fiscal policy) also leave equilibrium real output unchanged at y^* . Unlike monetary changes, however, fiscal policy has no impact on aggregate demand or the price level. Once we are at full employment, any increase in public spending will just reduce private spending by an equal amount, leaving total demand constant. This phenomenon is called "total crowding out" and will be explained carefully in Chapter Four.

What *can* enrich or impoverish the economy in the classical model is a rightward or leftward shift in aggregate supply, which can occur only with changes in capital (Δk) or labor (Δn^*), or a changing institutional structure (Δi^{nst}) that alters the "rules of the game" within which capital and labor operate. For a given institutional structure and fixed capital stock, the market clearing process insures full employment in competitive labor markets, moving the economy persistently toward AS^* . Whether growth in AS^* is steady, erratic, or absent is entirely independent of events on the demand side of the model.

This model is clearly consistent with the "limited government" attitude of the classical tradition in economics. It is based on the presumed ability of individual markets, working together, to organize economic activity and also to propel and guide the economy to its productive capacity without public intervention. This is the first of many instances in which we'll see a model apparently serving two very different functions at once. The classical macroeconomic model represents a **scientific investigation**—what *can* the government do? But it is often interpreted as a **political conclusion**—what *should* the government do?. At this point, we simply note that there is no reason why "can" and "should" must be in agreement. For example, it could be the case that the classical model underestimates the actual power of the government to influence the overall economy. This need not change one's personal preferences about what role the government should play. Just because they "can" do more than the classical structure suggests doesn't mean they "should". Alternatively, to the extent the classical model is correct about the limited powers of government in the overall economy, someone who is predisposed toward using government policy to improve economic well-being can obviously make better policy proposals by understanding these limitations on public actions. Just because you think the government "should", doesn't mean it "can".

This leads to the central question—which model presents the most accurate portrayal of the "real world"? As noted earlier, Keynes believed that the classical model was flawed in its emphasis on long run results and particularly its faith in the powers of the market clearing process to keep an economy from coming to rest below full employment. "It may well be", said Keynes, "that the classical theory represents the way in which we should like our Economy to behave. But to assume that it actually does so is to assume our difficulties away."¹⁰

Those who have followed in the Keynesian tradition have always focused on unemployment as the Achilles heel of classical economics. Its preoccupation with market clearing seems to prevent it from explaining unemployment that persists month-after-month and even year-after-year. This dispute is obviously crucial to policy-making and we'll turn to it in detail in later chapters. However, don't let this controversy obscure the equally important fact that the classical model continues to be a very useful and blessedly simple guide to understanding both *inflation* and *long run economic growth*, as we'll also see in later chapters.

2.7 OVERVIEW

1. **Economic theory** is the framework we use to express our opinions about cause-and-effect connections in the economy. It can be as casual as "if we do ____, then ____ will happen." Or it can be stated more formally and precisely in terms of equations or graphs.
2. Either way, the point is the same—we try to use good sense (logic and whatever clues we can glean from the past) to discern important and continuing relationships within the economy. We want to see if there are some basic, preferably simple, patterns that we can count on in making decisions and policies.
3. Our theories are often embodied in **economic models**—simplified representations of reality that capture essential economic patterns and interactions. A model that works well for one purpose (say, understanding inflation) may not work well for another (forecasting economic growth), so there can be a number of models. In addition, there are often alternative models of the same thing reflecting different judgments as to what are the "essential" variables and relationships and different readings of past experience. "Reality" seldom reveals itself neatly and simply. Much of the appeal of being an economist is to be engaged in the process of trying to combine ingenuity with hard work in order to discover additional evidence in favor of some models and against others.
4. These models are then used to ask questions ("What if . . .") in the hope that the answers will give us a reasonable picture (simulation) of what would happen if we conducted actual experiments on the actual economy. There are a depressingly large number of ways in which a model can be biased, incomplete, and misleading. But it's important to keep in mind that the alternatives to using a carefully designed model suffer even more weaknesses and are far less reliable guides to policy. Slogans, dogma, good intentions, and wishful thinking are poor and costly substitutes to careful analysis.

¹⁰ *The General Theory of Employment, Interest, and Money*, p. 34.

5. Two basic perspectives dominate current thinking and policy-making in macroeconomics and these are embodied in the **classical** and **Keynesian** models. Among their differences, which will emerge more fully in coming chapters, are:

a. different judgments as to the speed and reliability of **market clearing** in the overall economy.

b. different views of the appropriate time horizon for policy-making, leading to disagreement over the relevance of observed long run (but not short run) regularities in the **velocity** of money.

c. different individual judgments about the desirability of giving an active economic role to the government rather than putting primary reliance on competitive market forces for attaining our macroeconomic goals, particularly full employment and economic growth.

6. Modern macroeconomics is very much a reaction to the Great Depression of the 1930s, in which industrial economies throughout the world experienced unprecedented levels of unemployment for an extended period of time. This event led many economists to question the dominant classical model, which had evolved from the framework and tradition of Adam Smith's monumental *Wealth of Nations* (1776). In 1936, John Maynard Keynes (in *The General Theory of Employment, Interest, and Money*) offered an explanation for the crisis of the Thirties and a policy prescription that involved an expanded and active role for the government. Since then, macroeconomics has attempted to improve our understanding of the issue of "what the government *can* do" in a world in which decisions must constantly be made as to "what the government *should* do".

7. The ensuing controversies—some resolved, some not, some unresolvable because they involve personal preferences rather than scientific results—continue to define the activities of macroeconomists and their actions as policy advisors to Presidents, legislatures, Central Banks, international agencies, and corporations. These are not issues that stay quietly within the ivied walls of academia. Like it or not, they affect each of us, every day of our lives. They are debated by experts and novices alike. Often the least informed and least thoughtful hold the strongest opinions on "What this economy needs is . . . !". And sometimes they are in high places and have important policy-making powers. It is often not clear whether disagreements are over objective facts or subjective preferences. Many people cling to theories that have no factual support. Economic analysis tries to create a structure within which these issues can be discussed with the care and responsibility they deserve.

8. Perhaps the most crucial element in the classical model is the reliance put on the process of market clearing. It assumes a quick, complete response of prices and wages to changes in underlying supply and demand factors throughout the economy. Price adjustments insure that shortages and surpluses are rapidly eliminated. In the labor market, this process means that wage flexibility is sufficient to keep employment at or very near its full employment level. With individual self-interest working like an "invisible hand", the economy is guided quickly and surely to an equilibrium at full employment. All this is assumed and captured in the very simple **vertical aggregate supply curve, AS***.

9. The second key element in the classical model is the **Quantity Theory of Money**, which provides a framework for determining total demand in the economy. The Quantity Theory yields a relationship between the price level and total demand that is summarized in the downward sloping aggregate demand (AD) curve. Combined with the approximate long run constancy of the "velocity of money" (roughly, the rate at which dollars change hands), it also implies that the only thing that can shift the AD curve is changes in the money supply.

10. Together, market clearing and the Quantity Theory yield a representation of reality called the classical model. Using this to simulate the possible effects of actual policy-making, we find that our simple model yields the following predictions:

- a. The economy will automatically come to rest at full employment.
- b. The aggregate demand curve can be shifted by changes in the money supply ("Only money matters."), but not by changes in government spending or taxes ("Fiscal policy is powerless.").
- c. Shifts in AD change the price level but not output or employment ("Money is a veil.").
- d. A rising standard of living can only come through events on the supply side, namely changes in the quality or quantity of labor and capital inputs or a more effective institutional structure.
- e. Only the Central Bank has the power to cause (or cure) inflation.

2.8 REVIEW QUESTIONS

1. Define the following basic concepts:

<i>Keynesian Economics</i>	<i>Quantity Theory of Money</i>	<i>Policy Instrument</i>
<i>Classical Economics</i>	<i>Surplus</i>	<i>Say's Law of Markets</i>
<i>John Maynard Keynes</i>	<i>Shortage</i>	<i>"Money is a Veil"</i>
<i>The General Theory</i>	<i>Labor Market</i>	<i>"Only Money Matters"</i>
<i>Policy Activism</i>	<i>Real Wage</i>	<i>"Fiscal Policy is</i>
<i>Adam Smith</i>	<i>Money Illusion</i>	<i>Powerless"</i>
<i>The Wealth of Nations</i>	<i>Aggregate Demand</i>	<i>Monetary Neutrality</i>
<i>Institutional Structure</i>	<i>Velocity of Money</i>	<i>Inflation</i>
<i>Market Clearing</i>	<i>Price Level</i>	

2. Using the classical model of the overall economy, what impact would the following events have on the equilibrium values of the price level and total real output?
- An increase in government spending financed by higher taxes.
 - An increase in government spending financed by printing money.
 - A substantial increase in the nation's stock of capital.
 - A simultaneous increase in the capital stock and in the money supply.
3. In Chapter One we used the PPF to profile an economy that raised government spending but refused to raise taxes to pay for it. Using the classical AD/AS^{*} framework, what impact would such a policy have on the price level and real output? (Remember that there are *two* ways to finance the increase in government spending.)
4. Use the classical macroeconomic model to evaluate the likely impact of a substantial negative supply shock on output and the price level if the government:
- does nothing in response.
 - runs an expansionary monetary policy.
 - runs an expansionary fiscal policy.
 - runs a contractionary monetary policy.
5. Explain how each of the three important slogans below describes an implication of the classical model. In other words, describe the meaning behind the slogan and demonstrate that it is a logical consequence of the assumptions of the classical model.
- "Money is a Veil."
 - "Supply creates its own demand."
 - "Inflation is everywhere and always a monetary phenomenon."
6. Each graduation sees a flood of new job hopefuls entering the labor force. And while there are also retirements, they are usually many fewer. How can the economy keep absorbing this growing labor force, year-after-year? Where will the new jobs come from? Have we just been lucky or is there some systematic process going on which guarantees, more or less, that a market system will be able to handle a growing labor force?
- Use the classical framework to analyze this in terms of both the demand and supply sides of the model. That is, *will* the new jobs be created and if they are will there be enough *spending* to support this additional production? Explain.
7. Suppose the economy finds itself in a situation in which aggregate demand is well below aggregate supply, resulting in unsold goods and real output below its full employment level. How does the classical model explain the existence of such a situation and what remedy, if any, would it propose?
8. A key assumption in the classical model is that wages and prices are perfectly flexible, responding quickly to any changes in market conditions. Suppose, instead, that the *money* wage (W) can move upward but not downward while the price level (P) remains flexible.
- With the addition of this minimum nominal wage assumption, derive the corresponding aggregate supply curve for this economy.
 - Using this new supply curve, what impact would a decrease in the money supply have on real output and the price level in this economy?

- c. Some of the major implications of the classical model are listed below. Would the addition of this minimum wage assumption change any of these results? Explain your reasoning.
- Money is a veil.
 - Full employment prevails.
 - Only money matters.
 - We can't print our way to prosperity.
 - Economic growth can only come from the supply side.
 - Inflation is everywhere and always a monetary phenomenon.
9. Suppose that flexible wages and prices hold, but that "constant velocity of money" is dropped from the classical assumptions. Which of the implications listed in the question above will remain true? Explain your reasoning.
10. Suppose we discover that the economy's aggregate supply curve is actually horizontal in the "short run". Which, if any, of the four basic implications of the classical macroeconomic model would be affected by this change in one of the underlying assumptions of that model? Explain your reasoning.

2.9 FURTHER READING

Todd G. Buchholz, *New Ideas from Dead Economists: An Introduction to Modern Economic Thought* (New York: Penguin/Plume, 1989).

Robert Heilbroner, *The Worldly Philosophers*, Sixth Edition (New York: Simon & Schuster, 1986).

John Maynard Keynes, *The General Theory of Employment, Interest, and Money* (London: Macmillan Publishing Company, 1936).

David Laidler, *The Golden Age of the Quantity Theory* (Princeton: Princeton University Press, 1991).

Harry Landreth & David C. Colander, *History of Economic Theory*, Second Edition (Boston: Houghton Mifflin Company, 1989).

Adam Smith, *An Inquiry Into the Nature and Causes of the Wealth of Nations* (Oxford: Oxford University Press, Glasgow Edition of the Works and Correspondence of Adam Smith, Volumes I & II, 1976).