



MICHAEL BRANDL

**MANAGERIAL
MACROECONOMICS**

MANAGERIAL MACROECONOMICS

Michael Brandl

The University of Texas at Austin



**Custom
Publishing**

Boston Burr Ridge, IL Dubuque, IA Madison, WI New York San Francisco St. Louis
Bangkok Bogotá Caracas Lisbon London Madrid
Mexico City Milan New Delhi Seoul Singapore Sydney Taipei Toronto

MANAGERIAL MACROECONOMICS

Copyright © 2004 by The McGraw-Hill Companies, Inc. All rights reserved. Printed in the United States of America. Except as permitted under the United States Copyright Act of 1976, no part of this publication may be reproduced or distributed in any form or by any means, or stored in a data base retrieval system, without prior written permission of the publisher.

McGraw-Hill's Primis Custom Series consists of products that are produced from camera-ready copy. Peer review, class testing, and accuracy are primarily the responsibility of the author(s).

1 2 3 4 5 6 7 8 9 0 QSR QSR 0 9 8 7 6 5 4

ISBN 0-256-62109-8

Editor: Nicole Baumgartner
Production Editor: Melanie Castleberry
Cover Design: Robert Giorgio
Printer/Binder: Quebecor World

Contents

Macroeconomic Measurement	1
The Keynesian Approach	7

Dornbusch-Fischer-Startz • *Macroeconomics, Ninth Edition*

Aggregate Supply and Demand	22
Aggregate Supply: Wages, Prices, and Unemployment	39

Saunders-Cornett • *Financial Markets and Institutions: A Modern Perspective, 2/e*

Determinants of Interest Rates	70
The Federal Reserve System, Monetary Policy, and Interest Rates	106

Rose • *Money and Capital Markets, Eighth Edition*

Roles & Services of Federal Reserve & Other Central Banks Around the World	137
The Tools & Goals of Central Bank Monetary Policy	165

Van den Berg • *International Economics*

International Economics and the Global Economy	198
The Open Economy	228
The Evolution of the International Financial System	264

CHAPTER 2 MACROECONOMIC MEASUREMENT

July, 2004

Preliminary draft. Do not quote without permission. ©Michael Brandl

- 2.1 Gross Domestic Product
 - Final Goods and Services
 - Income Method
 - Expenditure Method
 - GDP versus GNP
 - Savings.
- 2.2 Nominal versus Real GDP
 - Real GDP
 - Price Indexes
 - Nominal versus Real Rates of Return.
 - Nominal versus Real Wages
- 2.3 Problems with the GDP statistics
 - Initial Releases.
 - Problems with the CPI.
 - GDP as measurement of Welfare.
- 2.4 Labor Market Measurement
 - Measuring Unemployment
 - Why Unemployment Levels Change.
 - Types of

One of the most important issues in macroeconomics is the study of macroeconomic statistics. Some of the most important statistics macroeconomists use comes out of nations' national income accounting accounts. In this chapter we will only touch upon how these different statistics are collected, we will spend most of our time discussing why these statistics are important to managers.

When the managers of a firm attempt to forecast how well their firm or division will do in the not too distant future one of the most important variables they must consider is the overall health of the economy. For most firms the relative strength or weakness of their markets will be greatly influenced by the strength of the overall economy.

But how does one measure the overall strength or healthiness of an economy? One could rely on anecdotal evidence or story telling, as many businesspeople, journalists, and pundits unfortunately still do, or one could seek out the facts. National Income Accounting systems give us the facts. With these facts we can compare the strengths of different economies across the world and across time. The national income accounts provide managers with very powerful information.

One of the most widely used and discussed components of the national income accounts is the gross domestic product statistic or GDP. While the GDP statistic is often discussed it is also very often misused and misunderstood.

2.1 Gross Domestic Product.

The Gross Domestic Product or GDP gives us a way to measure the total volume of goods and services that our economy is producing.

Gross Domestic Product (GDP): The market value of all final goods and services produced *in* an economy over a stated length of time.

Notice a few things about the definition of GDP. “Market value” means that GDP is calculated at current market prices. This is designed to represent the value society places on these goods and services, however it also opens the statistic open the possibility of being distorted by inflation.

The term “all final goods and services” means that GDP includes only those goods that are not completely used up in the production of another good service. By doing this GDP avoids the double counting of intermediate goods and services. Notice also that this part of the definition shows that GDP includes both goods, such as clothes, automobiles, etc. but also services.

Finally, the term “in an economy” goes to the idea that Gross Domestic Product includes the value of final goods produced within an economy’s geographical location, regardless of who owns the means of production. Gross National Product, on the other hand, measures the value of output of an economy’s citizens, no matter where they are located throughout the world. For example, a US firm that produces tennis shoes in Argentina has a value of output that is included in the US Gross National Product, but it is included in Argentina’s Gross Domestic Product. In 1992 the United States, following the lead of the rest of the world, switched its national income accounting system from GNP to GDP. While the US has a GNP that is slightly larger than it’s GDP, mainly due to US corporations abroad earn more than foreign corporations located in the US, the difference is small, less than one-half of one percent.

The key to understanding the GDP statistics is to keep in mind what GDP is trying to measure: how much an economy produces in a given time period. If you think about it, there are a couple of different ways to calculate this. We could add up all of the spending that goes on in the economy, or we could add up everyone’s income in the economy. Either approach should give us, roughly, the same figure because one person’s spending is someone else’s income.

This is an important concept to keep in mind: one person’s spending is someone else’s income. Think of a very simple example: a farmer’s market on a Saturday morning. If you go to the farmer market and buy a basket of apples for \$5, your spending of \$5 is the farmer’s income of \$5. So, one person’s spending is another person’s income.

Now, let's aggregate that idea up to the entire economy. If we want to calculate the total amount of output, we could total up the amount of spending, or the total amount of income. They should all, roughly, equal the same thing. So we get:

$$\text{GDP} = \text{Total spending, total income, and/or total output.}$$

Let's look at each of these approaches a little more closely:

Income method: compensation of employees + rent + interest + proprietors income + corporate profits + depreciation + indirect business taxes.

With the income method we are totaling up all of the income in the economy. There are a few things to note about this approach. First, note that it says compensation *of* employees not compensation *to* employees. Thus, this figure is going to include things like fringe benefits, etc. Thus, it can get difficult to verify. Second, note the adding back of depreciation. As you have probably seen in your management accounting course, this figure is determined (rather arbitrarily) by government policy.

It is because of the difficulty to correctly measure these two components (there are other issues as well) that leads to the income method not being used that often. In government statistics and in the business press you will most often see GDP discussed in terms of the expenditure method.

Expenditure method: Consumption + Investment + Government spending + Net Exports.

$$\text{GDP} = C + I + G + (X-M)$$

To give you some idea of the breakdown of these components, here is what they were in the 3rd Quarter of 2003 (seasonally adjusted, nominal levels, from the Dept. of Commerce):

GDP	\$11,107 billion
Consumption	7,836.3billion (70.5%)
Gross Private Domestic Investment	1,689.1billion (15.2%)
Government	2,072.1billion (18.6%)
Net Exports	- 490.6billion (- 4.4%)

Consumption: The spending of households on final goods and services.

Consumption includes household spending on consumer durable goods (things that last longer than one year), non-durable goods (things that last less than a year) and services.

Notice what a large percentage of the GDP comes from consumption. This is one of the reasons why the business press is often filled with stories about consumer confidence,

unemployment rates, retail spending, etc. Consumption plays a huge role in our GDP statistic and thus in the overall well being of our economy.

Investment: Business expenditures that adds to (or replace) the economy's capital stock (plants, equipment, structures, inventory, etc.). These goods are not entirely used up in the production of another good or service. Investment gets divided up between fixed investment (machines, equipment, etc.) and inventory investment.

Government: Local, state and federal government purchases of final goods and service. Transfer payments are not included.

Net Exports: Exports of final goods and services minus imports of final goods and services.

Major changes in any of these will thus have an effect on the total level of output and thus on the health of the economy. Of these four variables investment, or business spending is the volatile. There is a great deal of disagreement among economists as to why this is the case, but it remains a fact. Throughout the remainder of the book we will take a much closer look at each of these different components of GDP.

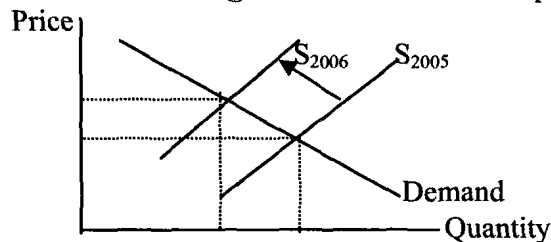
2.2 Nominal versus Real GDP.

When a businessperson wants to compare levels of output over time one of the first problems they must confront is the distortion caused by inflation. In this chapter we will show how inflation distorts managerial decision making and discuss the tools you will need to ensure that you, unlike your managerial predecessors, do not get fooled by inflation.

In our description and definition of gross domestic product you may have noticed that GDP is measured in current market prices, for the US in dollars. The problem is that the value of the dollar can and does change over time. Some times the dollar buys a lot, other times the dollar doesn't buy much at all. It would be foolish, for example to argue that the level of output in Russia is currently increasing by 250% a year. Most of the increase in the Russia GDP is coming from the increases in prices in Russia, not because the Russian economy is producing so many more goods and services. In order to get a true sense of the health of an economy we want to be able to measure the actual or true amount of goods and services that are being produced. That is we want to be able to get around the inflation distortion.

Real GDP v. Nominal GDP: Real levels are adjusted for changes in price levels.

Ex: Year Output
 2005 T-shirts @ \$8/ea. → nominal output = \$800.
 2006 T-shirts @ \$14/ea. → nominal output = \$900.



⇒ Real output in 2006 (using 2005 prices) = 60 X \$8 = \$480. In *real terms* the firm is worse off.

Price Indices. In order to do more realistic comparisons over longer periods of time we need to use price indices. (CPI v GDP deflator)

→ A price index compares the price in one period to the price in some base year.

$$PriceIndex = \frac{Currentyearprice}{baseyearprice} \times 100$$

Ex: CPI: Consumer Price Index
 Texas CPI
 GDP deflator

Using price indices to get real levels

$$Real = \frac{NominalLevel}{PriceIndex} \times 100$$

Ex:

<u>Year</u>	<u>Nominal</u>	<u>Price Index (2002 = 100)</u>
2003	100	105.0
2004	150	112.35
2005	175	115.7
2006	210	120.0

Real level in 2006 using 2002 as base year =

$$\frac{210}{120} \times 100 = 175$$

Real level in 2004 using 2002 as a base year =

$$\frac{150}{112.35} = 133.5$$

Q: What is the real level in 2006 using 2004 as a base year?

Main point: We want to compare real levels overtime and look at real growth rates.
Don't be fooled by nominal numbers.

Note: We will assume that increases in real GDP per capita overtime are a GOOD thing.

Nominal versus Real Rates of Return

Nominal versus Real Wages

2.3 Problems with the GDP statistics

- Initial Releases.
- Problems with the CPI.
- GDP as measurement of Welfare.

2.4 Labor Market Measurement

- Measuring Unemployment
- Why Unemployment Levels Change.
- Types of

CHAPTER 6 : THE KEYNESIAN APPROACH.

July, 2004

Preliminary draft. Do not quote without permission. ©Michael Brandl

- 6.1 Aggregate Demand
 - Wealth Effect
 - Interest Rate Effect
 - Exchange Rate Effect
- 6.2 Changes in Aggregate Demand
 - Autonomous Changes in Spending
 - Fiscal and Monetary Policy
- 6.3 The Original Keynesian Aggregate Supply Curve
 - Keynes and the Classicalists.
 - The Keynesian Spending Multiplier
 - Box: Shortcomings of the Keynesian Spending Multiplier
 - Box: Deriving the Keynesian Spending Multiplier.
 - The Economy at Full Employment
- 6.4 The Three Part Keynesian Aggregate Supply Curve
 - Sticky Prices.
 - Menu Costs.
 - Supply Shocks.
- 6.5 The Phillips Curve
 - Inflation/Unemployment Trade Off.
 - Phillips Curve In Action.
 - “Fine Tuning” the Economy.
 - Breakdown of the Phillips Curve.

One of the most useful models for businesspeople to use to analyze and understand the macroeconomy is the Aggregate Supply/Aggregate Demand framework. For shorthand we will refer to it as the AS/AD framework or model. The AS/AD framework is similar logically to the supply and demand framework that you may have used in a microeconomics course. Yet the AS/AD framework is not simply a summing of all of the individual supply and demand curves. While the AS/AD framework is very useful it remains controversial. We will discuss what this powerful management tool is, how it works, demonstrate its usefulness and discuss the controversies that surround it.

The British economist John Maynard Keynes first laid out the logic behind the aggregate supply/aggregate demand curve framework. Keynes was writing in the 1930s trying to explain the economic catastrophe of the Great Depression that had both Europe and the United States in its grips.

Throughout the 1920s and especially in the 1930s Keynes was very critical of the British government's economic policies. For example, he argued in 1929 that the British government should attempt to stimulate the economy and not fear running temporary budget deficits. However without a formal theory on which to base his argument Keynes' pleas were ignored. Keynes needed to provide an alternative theory to the classical laissez-faire doctrine that dominated economic thinking and economic policies of his day. His answer leads to the development of the aggregate supply-aggregate demand curves.

6.1 AGGREGATE DEMAND.

In analyzing the economy in terms of aggregate supply and aggregate demand it is important to remember that we are examining the entire economy. So instead of the looking at the price/quantity relationship¹ for an individual good or service, we are looking at the relationship between the *price level* and *total output*. For example, instead of looking at the demand for one good, such as laptop computers or luxury automobiles we are looking at the total or aggregate demand. Aggregate demand then is the relationship between the total real quantities of goods and services that households, firms, and governments want to purchase and the price level². Put more formally, aggregate demand shows the level of real national output that will be demanded at each price level. Aggregate demand is shown graphically in figure 6.1

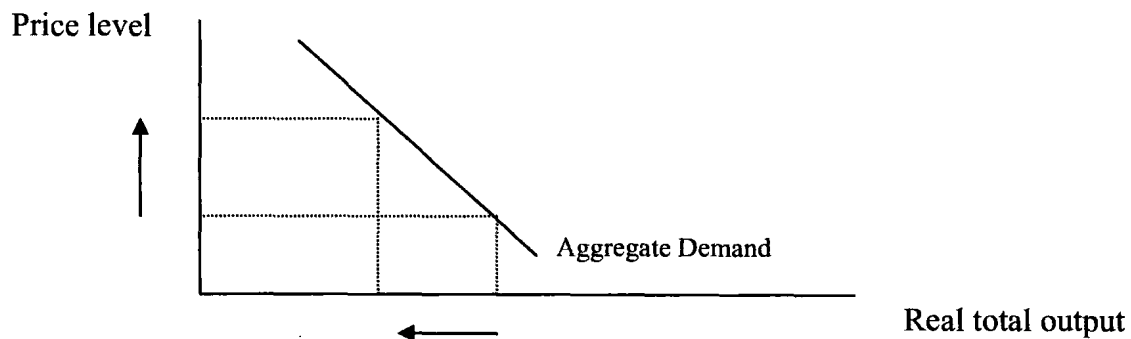


Figure 6.1

Notice in Figure 6.1 since we are discussing aggregate demand we now have price level on the vertical axis and real total output on the horizontal axis. Compare this to the microeconomic level discussion of supply and demand where the good or service's individual price is on the vertical axis and the quantity of the good or service is on the horizontal axis.

Remember from our discussion on national income accounting real total real gross domestic product, or real GDP can represent output. The expenditure method of GDP calculation tells us that real GDP levels are determined by the spending of households on

¹ An important distinction to remember is that in a microeconomic analysis when we speak of the price of a good we are referring to the relative price of the good. So when we say that an increase in the price of an ice cream cone will lead to a decrease in the quantity demanded of ice cream cones, it is in part because ice cream cones now are relatively more expensive than all other goods. Thus, consumers will substitute away from the more expensive ice cream cones and eat more of the less expensive candy bars. When we speak of the price level in our aggregate supply/aggregate demand discussion we are no longer talking about relative prices since we are looking at all prices at once.

² The aggregate demand schedule and corresponding aggregate demand curve are equilibrium concepts. That is they show for each price level the level of spending at which the goods and asset markets are simultaneously in equilibrium.

final goods and services (which we call consumption), spending by firms (which we call investment), all levels of government spending and net exports. Or

$$\text{GDP} = C + I + G + (X - M) \quad (6.1)$$

Where C is consumption, I is investment or business spending, G is government spending, X is the level of exports and M is the level of imports. Thus, the horizontal axis in Figure 6.1 measures the level of real GDP.

Notice also that the aggregate demand curve in Figure 6.1 slopes downward. That is, as the price level increases there will be a reduction in the total output quantity demanded. There are three general reasons why the aggregate demand curve slopes downward: the wealth effect, the interest rate effect, and the exchange rate effect.

Wealth effect. To see the wealth effects on aggregate demand consider how household behavior changes when the price level changes. As the price level falls the real value of the households wealth raises. That is, as prices across the economy fall, the purchasing power of your assets (your stock portfolio, your children's college funds, your rainy day savings accounts, etc.) increase. Holding everything else constant, as wealth increases household spending increases. On the other hand if prices across the economy are increasing the purchasing power of your assets is falling or the real value of your wealth is falling. Thus, in order to protect the real level of your wealth you must save more. However, if money incomes are not increasing the increased level of savings will mean less consumer spending. For example if you learn that the cost of sending your kids to college is going to be double of what you thought, then the real value of their college fund has been cut in half. In order to send them to college you will need to save twice as much. If your income does not increase that will mean that your spending will have to fall. Thus, when the price level increases consumption spending and thus total spending will fall due to the wealth effect.

Interest rate effect. As the price level falls economic agents will need less money to buy the same amounts of goods and services. If people need less money in their wallets or purses they will save the extra money. This extra savings will make its way either into the banking system, as people deposit the extra cash into their savings accounts, or into the bond market as people buy more bonds. The extra cash in the banking system or increased demand for bonds will both push down interest rates. As interest rates fall, firms will find their cost of capital has fallen and investment or business spending will increase. Thus as the price level falls there will be an increase in total spending, or as the price level falls there will be an increase in the aggregate quantity demanded.

Exchange Rate Effect. If the price level in the United States rises faster than the price level in other countries, the US will see an increase in imports and a decrease in exports. Thus, according to equation 6.1 an increase in the US price level relative to other countries will result in a lower level of aggregate quantity demanded. To see why, first assume that the money supply in the United States is held constant. As discussed above if prices increase people will need more money to buy the same amount of goods and

services. This increase in demand for dollars will force US interest rates upward. Higher US interest rates will cause an increase in demand for dollars by international institutional savers. This increase in demand for dollar will cause the dollar to appreciate in foreign exchange markets. This stronger dollar in turn will result in a higher level of imports in the US and depress US exports. The outcome again is the inverse relationship between the price level and the total level of real output.

The downward sloping aggregate demand curve can also be explained more formally if we consider the role of the real money supply. The wealth effect, interest rate effect and the exchange rate effects are all ways of saying the same thing: aggregate demand depends on the real money supply, that is aggregate demand depends on the true purchasing power or value of the money supply. To see why consider equation 6.2:

$$M = \frac{m_s}{P_L} \quad (6.2)$$

Where m_s is the nominal money supply, P_L is the price level, and M is the real money supply. If M increases then real interest rates fall, investment or business spending increases and aggregate quantity demanded increases. If on the other hand M decreases then real interest rates will increase, investment or business spending will fall, and real gross domestic product will fall. Thus, equation 6.2 captures the interest effect very simply.

The wealth and exchange rate effects can also be seen using equation 6.2. If the price level falls, and the money supply is unchanged, then M will increase. But M , or the real money supply, is one way in which economic agents can measure the true value of their wealth. If M is raising, people see their wealth increase and they will spend more pushing consumption and aggregate quantity demanded higher. This raising M will put down pressure on the dollar in foreign exchange markets leading to an increase in US exports and a decrease in US imports. Thus, a falling price level, holding everything else constant will result in a higher level of GDP.

We have seen in words, in mathematical symbols, and graphically that the aggregate demand curve slopes downward. However, the aggregate demand curve holds for only one point in time. What happens is that over time things can and do change that will bring about a whole new aggregate demand curve. That is over time things can and do change that will give us a whole new price level/total spending relationship. Graphically, over time the aggregate demand curve can move or shift.

6.2 CHANGES IN AGGREGATE DEMAND

What are the things that can and do change over time that will cause the aggregate demand curve to shift? Basically, they are changes in the money supply and changes in the level of spending that are independent of the price level. We look at each of these in turn.

Autonomous changes in spending. In explaining why the aggregate demand curve slopes downward we used equation 6.1 to show how the different spending component of GDP might react to a change in the price level. However, if you think about it, consumption, investment, government spending, and net exports can change for a number of reasons other than changes in prices. For example household spending and investment may be greatly affected by expectations about the future. If consumers are confident about their future economic well-being they might increase their level of spending. For example, if workers are confident that they will keep their jobs in the future, they might be more likely to buy more automobiles, home computers, eat out more often, etc. all of which would result in a higher level of total spending. Business spending is also very dependent on expectations. If your firm is confident that the market they sell into will continue to expand, upper management will be more likely to approve capital expenditures. Thus, an increase in confidence will lead to an increase in spending that is independent of the price level. Graphically, an increase in confidence that leads to an increase in spending will shift the aggregate demand curve outward as is seen in figure 6.2.

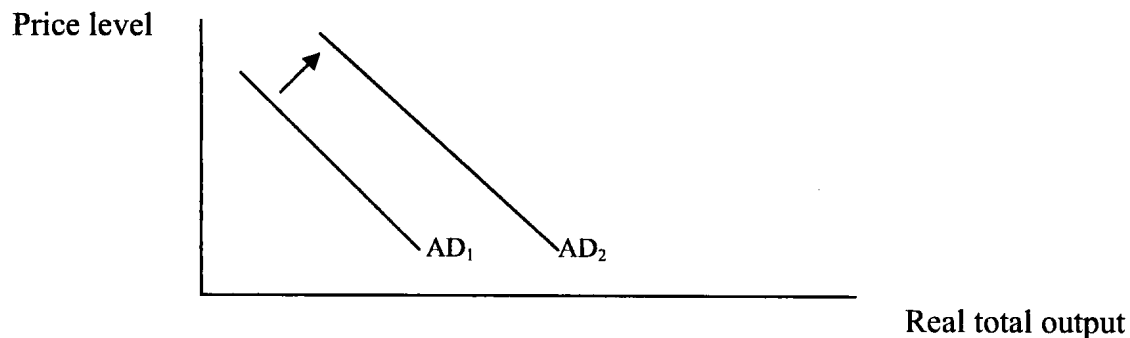


Figure 6.2

Notice the result of the increase in aggregate demand is that there is a higher level of real total output at every price level.

Fiscal and Monetary Policy. In addition to autonomous changes in private spending brought about by changes in expectations, changes in governmental economic policies can bring about movements in the aggregate demand curve. An expansionary fiscal policy such as an increase in real government expenditures and/or a reduction in tax rates will, *ceteris paribus*, increase the level of total spending at every price level. Thus, an expansionary fiscal policy will shift the aggregate demand curve outward. On the other hand, a reduction in the real level of government spending, and/or a tax increase, will shift the aggregate demand curve back or towards the origin. If the central bank increases the nominal money supply this will increase aggregate while a central bank

tighten of monetary policy by reducing the money supply³ will decrease aggregate demand.

Thus, increases in spending and increases in the money supply will increase aggregate demand and shift the aggregate demand curve outward. Decreases in spending and/or decreases in the money supply will decrease aggregate demand and shift the aggregate demand curve back or towards the origin.

6.3 THE ORIGINAL KEYNESIAN AGGREGATE SUPPLY CURVE

The concepts of aggregate demand and the causes for changes in aggregate demand are topics upon which most macroeconomists agree. There is much less agreement however on what the aggregate supply curve looks like and how it works. Thus, when you as a businessperson are listening to someone describe the state of the current macroeconomy and/or make predictions about the future state of the economy it is important that you understand the context in which this person is viewing the economy. One can have very different perceptions of economic activity depending upon what one's beliefs are as to the shape of the aggregate supply curve⁴. We will start off by examining the original Keynesian aggregate supply curve and its implications. We will then discuss the newest version of the Keynesian aggregate supply curve and how it differs from the original Keynesian aggregate supply curve. In the next chapter we will discuss a more complex version of the aggregate supply curve.

In general the aggregate supply curve is designed to show the quantities of real output that the economy is prepared to supply at different price levels. That is at different price levels how much real output is the economy willing to produce? In order to understand the original Keynesian aggregate supply curve, one must keep in mind the context in which Keynes was writing. Keynes was trying to explain the Great Depression of the 1930s. The conventional wisdom of the Keynes' day held that recessions and depression were really not a problem. Markets were self-correcting and the economy always operated at or near full-employment. If there was unemployment, conventional theory of Keynes' day held, wages would fall in long run and labor markets would clear. Keynes agreed that in the long run markets would clear but in a famous quote Keys declared, "in the long run we are all dead."

Keynes needed to develop an aggregate supply curve that could explain the Great Depression and offer remedies for it. According to Keynes labor markets in modern economies were not perfectly flexible. A major problem Keynes believed was that

³ Most likely it will be that the central bank will reduce the rate of growth of the money supply, not reduce the actual money supply. However the logic is the same.

⁴ Many economic textbooks, especially those written in the United States, seek to downplay this issue. They claim that there is now a growing "consensus" among macroeconomists and some even suggest that there is very little disagreement between macroeconomists. For businesspeople trying to decipher what the economic "experts" are saying this perspective is dangerous. The economic advice one hears is often contradictory and to believe that there is a great consensus among macroeconomists will result in making economists look foolish and economics impossible to understand.

money wages would not fall to alleviate unemployment. Due to things like union labor contracts, limited competition and monopoly market power, many prices, including wages were sticky down ward. The result is at less than full employment output levels y change but the price level will remain constant. The original Keynesian aggregate supply curve is shown in figure 6.3.

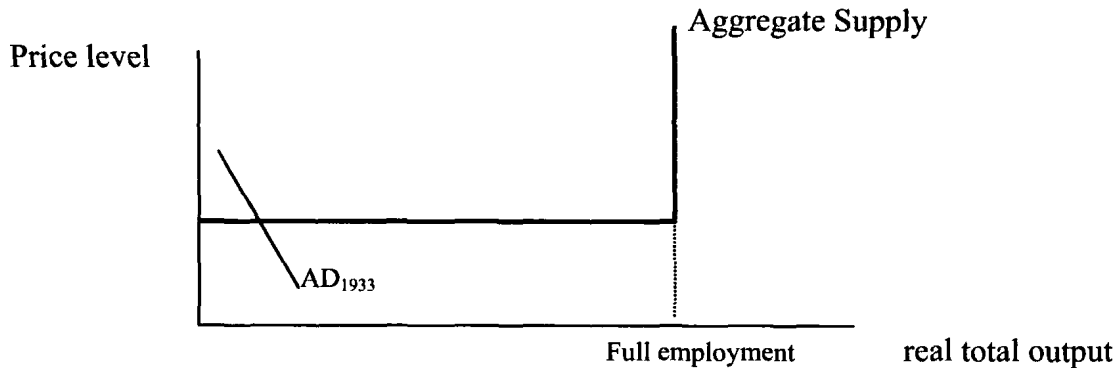


Figure 6.2

In terms of the Great Depression of the 1930s the economy had seen a significant drop in aggregate demand back to AD_{1933} . Notice the level of output is well below the full employment level of output but the economy is at equilibrium. However since the economy is at equilibrium, unless something else happens the economy will stay right there! Thus, according to Keynes since prices are sticky downward the economy can get stuck at an equilibrium that has a very low level of output and a corresponding high level of unemployment. This is exactly what Keynes was seeing in the 1930s! High unemployment, without much movement in prices. Something had to be done.

Keynes suggestion was to increase aggregate demand in order to increase output and push the economy toward full employment. Total spending needed to be increased, but how? In considering the various components of aggregate demand Keynes settled on government spending as being the key variable to stimulate spending. Investment spending, according to Keynes, was driven by the “animal spirits” and thus undependable. In Keynes view businesspeople behaved like a pack of wild animals when it came to spending decisions. A businessperson would follow the behavior of “everyone else” in the market increasing or decreasing expenditure levels spastically. Thus, total investment spending could swing wildly on the basis of unfounded rumors and connections. Relying on investment spending to rebound to end the depression was unthinkable to Keynes.

Just as investment spending could not be relied upon to end the Depression, neither could consumption spending. Even if household disposable incomes were to increase dramatically instead of spending this newfound income, households would save the money thus draining the economy of much needed capital. Keynes’ paradox of thrift left government spending as the only variable left to stimulate the economy.