ADVENTURES IN MACROLAND

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"I can't believe that," said Alice.
"Can't you?" said the Queen in a pitying tone. "Try again; draw a long breath and shut your eyes."
Alice laughed. "There's no use trying," she said. "One can't believe impossible things."
"I daresay you haven't had much practice," said the Queen. "When I was your age, I always did it for half an hour a day. Why, sometimes I've believed as many as six impossible things before breakfast."

Lewis Carroll, Through the Looking Glass

The inconsistencies and logical errors found in the macro section of many principles of economics textbooks are so bizarre, and yet, so uniform, that one is compelled to compare the beginning students' investigation of the mysteries of macroeconomics with Alice's adventures in wonderland.

The macroeconomic inconsistencies and errors that make us to question whether we are in wonderland are built around the standard treatment of aggregate demand (AD) and aggregate supply (AS) curves found in virtually all principles of economics texts. Most of the macro chapters which follow the introductory circular flow concept are heavily laced with AD-AS diagrams in which the downward sloping AD curve is clearly different from the upward sloping AS curve. Never mind that our young scholars have learned, after plodding through a maze of circular flow diagrams, that AD and AS are simply two sides of the same coin.

The principal contribution of this paper is to expose the nonsense and inconsistencies that lead students to conclude that the aggregate demand curve is downsloping, while the aggregate supply curve has a positive slope. A secondary purpose is to demonstrate the unreality of the textbook descriptions of the interaction of these wonderland characters named AD and AS.

I.
The Vertical Axis and the Slope of the AS Curve

The text authors agree that real GDP is measured on the horizontal axis of the AD and AS diagrams with the price level measured vertically as shown in Figure 1. There is
considerable confusion, however, about the meaning of the "price level" label for the vertical axis. Does it refer to all prices, or just to some prices?

McConnell and Brue [6, p. 152] are very explicit in stating that changes in the price level include prices paid to resource suppliers as wages, rent, interest, and profits as well as prices paid for goods. Case and Fair [3, p. 717] similarly state "...when the price level rises, many prices — including many wage rates (and thus many people's income) — rise together." Stiglitz [10, p. 694], however, states that the aggregate demand curve "is drawn under the assumption that wages and relative prices are fixed." At this point our better students are likely to openly question why increases in prices on one side of the circular flow of income are not matched by increased prices on the other side.

**Figure 1**

![Diagram of Aggregate Demand/Aggregate Supply](image)

After learning that changes in the price level reflects changes in all prices, as most principles textbook authors assume, some of our best students must be a trifle confused when they read that the AS curve has a positive slope because price level changes include only goods prices while resource prices are held constant. In other words, as the price of goods increase, while input costs remain fixed, business profits expand inducing firms to increase output. This explanation is found in Stiglitz [10, p. 692], Byrns and Stone [2, p. 114], Ekelund and Tollison [4, p. 600], Parkin [7, p. 645], Baumol and Blinder [1, p. 229], and Ruffin and Gregory [8, p. 156]. Hyman [5, pp. 677-678], provides this typical statement. "When drawing an AS curve, we assume that all input prices ... in the economy are fixed."

Stiglitz [10, pp. 692-693] takes a slightly different approach by relating the aggregate supply curve for the economy to the individual firms supply curve. He states:
“Aggregate supply at any price level is simply the sum of the quantities supplied by each of the firms in the economy at that price level. The amount that each firm is willing to supply depends on the price it receives. At higher prices, keeping wages fixed, each firm is willing to supply more, so aggregate supply is higher. Tracing out the levels of output firms are willing to supply at the price each one receives increases generates the aggregate supply curve.”

Again, the best principles students, who mastered the partial equilibrium analysis in micro economics, know that a composite marginal cost curve for all firms in the economy could be an AS curve only if input prices such as wages are fixed as goods prices change. But as Case and Fair point out [3, pp. 721-722]: “If wages move with goods prices, then the aggregate marginal cost curve would shift up or down with the goods price level producing a vertical AS curve.”

Clearly, the authors of our principles texts cannot have it both ways: if when drawing AD curves, the price level on the vertical axis includes all prices (goods and resources), then when drawing the AS curves, they may not ask the student reader to assume that resource (wages) prices are constant.

II.
The Shape of the AD Curve

There is a consensus among text authors that the negative or downward sloping shape of the AD curve requires special explanation. The law of demand for a single good, which holds that people substitute X for Y when the price of Y increases relative to the price of X, simply does not apply to all goods and to all prices. Also, if money incomes (particularly wages) rise (fall) as the price level increases (decreases), then total spending would rise when the price level increases and fall when the price level decreases. Therefore, an AD curve which displays an inverse relationship between the price level and real output cries out for a special explanation.

The principles textbooks typically offer student readers three factors which cause the AD curve to have a familiar downsloping shape: (1) the wealth effect or real balance effect (and sometimes call the “Pigou effect,” for British economist A. C. Pigou, who is credited with identifying this factor); (2) the interest rate effect or money supply effect (sometimes called the “Keynes effect,” for British economist J. M. Keynes, who is credited with identifying this factor); and (3) the international effect or foreign trade effect.

The Wealth Effect

Students are told that as the price level rises money loses purchasing power and other financial assets, which represent claims to fixed amounts of money, likewise depreciate in value. Hence, money and fixed financial asset holders, feeling less wealthy, reduce aggregate spending which in turn causes output to decline.
When the price level falls, money and other financial assets appreciate in real terms, causes holders of these financial assets to spend more, which in the chain of causality causes an increase in total output. This explanation of the shape of the AD curve is found in McConnell and Brue [6, p. 152], Byrns and Stone [2, p. 109], Ruffin and Gregory [8, p. 153], Baumol and Blinder [1, pp. 191-193], Parkin [7, pp. 639-640], Ekelund and Tollison [4, p. 593], and Hyman [5, p. 673].

Critique of the Wealth Effect

A discerning student must certainly be aware that if the holders of financial assets are poorer when the price level rises, the issuers of these financial assets are wealthier; and the converse occurs when the price level falls. The effect of a change in the price level will therefore have no effect on aggregate wealth relative to financial assets, other than currency. If there is a grain of relevance to the wealth effect it must therefore involve the currency component of the money supply. But, according to official estimates, two-thirds of U.S. currency is circulating abroad in foreign markets, and therefore has no relevance to spending and output in the U.S. economy.¹

Perhaps an even more serious challenge to the wealth effect involves the impact that a rising, or falling, price level has on the value non-financial assets held by the public. Many of our students know that the United States is a nation of homeowners. They also know that when the goods price level moves up or down, real estate prices tend to move in the same direction, and historically by greater amounts. As the goods price level rose in the 1970s and early 1980s, residential real estate prices rose even more, home owners clearly felt wealthier, and, as a consequence of the wealth effect, spent more at higher price levels rather than less.

Thus when the wealth effect is examined in the context of both financial and non-financial assets the argument that the wealth effect leads to a downsloping aggregate demand curve is at best questionable. It would appear that if there is a wealth effect, its net influence is likely to make the AD curve have a positive slope rather than down than be negatively sloped.

The Interest Rate Effect or The Keynes Effect

Just as the wealth effect is not presented to students as a theory proposed by a particular economist (Pigou), the interest rate effect is generally not presented as a theory, attributed to Keynes. Rather, both of these factors are presented to students as facts — i.e. the way the economy actually works.

The interest rate effect, or the money supply effect according to Samuelson and Nordhaus [9, p. 457], assumes that the nominal money supply is constant as the price level moves up

or down. Therefore, the real money supply moves inversely with the price level. Following Keynes, a lower real money supply, which results from a rising price level, pushes the interest rate up. The higher interest rate reduces business investment spending on plant and equipment. Lower investment then produces an even larger reduction in real output (the Keynesian investment multiplier). A falling price level causes an opposite result. Principles students are once again expected to conclude that the price level and aggregate demand are inversely related.

Principles texts which offer this interest rate effect as an explanation of the negative slope of the AD curve include: McConnell and Brue [6, p. 153], Parkin [7, p. 640], Ekelund and Tollison [4, p. 595], Samuelson and Nordhaus [9, p. 457], Case and Fair [3, p. 714].

Several text authors offer what appears to be a different explanation of the interest rate effect. Byrns and Stone [2, p. 110], Ruffin and Gregory [8, p. 153], and Hyman [5, pp. 673-74], argue that a higher price level increases the demand for credit, which pushes interest rates up, which, in turn, pushes investment spending down, etc. Of course, this argument implicitly assumes that as the price level rises the supply of credit is constant, which is substantially the same as the explicit assumption made by McConnell and Brue, Parkin, Samuelson, et al., that the nominal money supply is constant as the price level changes.

Critique of the Interest Rate Effect—The Quantity Theory of Money

What must the intelligent sophomore think about the Samuelson’s case [9, p. 457] in which the price level increases 50 percent in one year while the nominal money supply is constant? What of the overwhelming evidence accumulated over several centuries which relates changes in the price level to changes in the nominal money supply? What about statements which are common in undergraduate textbooks such as the following?

“Prices and money supplies tend to move in the same direction. Historically, there has never been a sustained increase in the money supply that has not led to increases in prices, and there have never been sustained increases in prices that have not been accompanied by increases in the money supply.”

Apparently, a land in which substantial changes in the price level occur while the nominal money supply is constant is only to be found at the bottom of Alice’s rabbit hole or behind her looking glass.

Critique of the Interest Rate Effect — The Real Rate of Interest

The principles text authors are usually explicit about the interest rate change which induces changes in real investment and real output: it is the real rate of interest, not the nominal rate. Here are some examples. “The lower the real interest rate, the higher is the

level of investment." Parkin [7, p. 640]. "Note that the real rate of interest, rather than the nominal rate, is crucial in making investment decisions," McConnell and Brue [6, p. 187]. "The amount that business will want to invest depends on the real rate of interest that they have to pay on their borrowings. The lower the real rate of interest, the more investment spending there will be," Baumol and Blinder [1, p. 183]. "As real interest rates rise, business firms cut back on their purchases of investment goods..." Hyman [5, p. 674].

Certainly, an alert student will wonder if a rise in the nominal interest rate, which is caused by a rising price level, also represents an increase in the real interest rate. If higher nominal interest rates reflect rational debtor/creditor decisions to adjust for erosion in the purchasing power of units of money caused by a rising price level, then the text authors are basing the interest rate effect on changes in nominal rates of interest — not on changes in real rates, as presented in their discussion of why the Aggregate Demand curve is negatively sloped.

Once again, our intelligent sophomore’s adventures in macrooland are reminiscent of Alice’s.

The International or Foreign Trade Effect

An increase in the price level in the U.S., assuming price levels in foreign countries are constant, will reduce U.S. exports and increase U.S. imports, thereby reducing real GDP in the U.S. A decrease in the U.S. price level produces the opposite impact on real output. Hence, the international trade effect provides a powerful reason for expecting the AD curve to have a negative slope according to: Byrns and Stone [2, p. 109], Ekelund and Tollison [4, p. 499], McConnell and Brue [6, p. 153], Parkin [7, p. 640], Ruffin and Gregory [8, p. 153].

Critique of the International Trade Effect

In all but one of these texts there is no mention of the foreign exchange rate (forex); Ruffin and Gregory [8] state explicitly that the reader is to assume that the forex is constant. If student readers assume that all the text authors are holding the forex constant, then an intelligent student would attempt to evaluate this argument in a pre-1930s gold standard setting, or in an international monetary arrangement where central banks peg the forex, such as the Exchange Rate Mechanism of the European Monetary System before that arrangement began to unravel in the fall of 1992.

Under an international gold standard monetary system, if a nation’s purchases of foreign goods exceed its foreign sales, part of its stock of monetary gold flows abroad. Conversely, an excess of foreign sales over foreign purchases causes a gold inflow. Under paper standard monetary systems, with exchange rates pegged by central banks in free foreign exchange markets, incipient balance of payments deficits force central banks of deficit nations to restrict monetary growth, while an international surplus pressures the central bank of a surplus nation to increase the rate of monetary growth. Just as under a gold standard setting, an
excess of foreign purchases over foreign sales causes monetary contraction, while an excess of sales over purchases results in monetary expansion.

In both arrangements for keeping the forex fixed or constant, a rising price level in nation X relative to the price levels in other countries would cause monetary contraction in X and monetary expansion in the national economies of X’s trading partners. These money stock changes would moderate or reverse the rise in X’s price level and cause the price level of foreign countries to rise — effectively neutralizing the international trade effect as an explanation of the shape of the AD curve.

If, as is most likely, our intelligent sophomore evaluates the international trade effect argument in a setting of freely flexible exchange rates, then the law of one price or the concept of purchasing power parity intrudes to negate the international trade effect. When the price level in nation X rises relative to price levels abroad, X’s currency depreciates relative to foreign currencies. Conversely, a relative decline in X’s price level causes appreciation of X’s currency in the foreign exchange market. These forex changes neatly offset the impact on exports and imports which the text authors assume will occur when a nation’s price level rises or falls.

III.

Interaction of AD and AS Curves

When the AD curve shifts, we discover a final proof that AD-AS analysis in contemporary texts is better suited for fantasy fiction than for serious collegiate texts. The textbook explanation of real world events seems to make sense when the AD curve shifts to the right, as is shown in Figure 2, and the result is a higher price level and an increase in real GDP. However, when our intelligent student moves the AD curve to the left to explain what happens in recessions, real GDP does contract, but the price level also declines. Yet, when our student investigates past U.S. recessions since President Truman’s famous “accord” between the Treasury and the Federal Reserve (i.e., the recessions of 1953-54, 1957-58, 1960-61, 1969-70, 1973-75, 1980, 1981-82, 1990-91), she finds that, although real GDP declined in each of these eight post-1950 recessions, the price level continued to rise both during and after these recessions. Once again we find that the real world is fundamentally different from the macroland presented in American principles of economics textbooks. Textbook authors however are not always constrained in their explanation by the facts. For example Stiglitz [10, p.791], using the interaction of AD/AS curves states:

"Beginning in the late 1970s and early 1980s, the Federal Reserve Board acted to restrict credit, and thus consumption and investment, in an attempt to reduce inflation. The resulting leftward shift in aggregate demand reduced the price level but also caused a recession. The effects were so strong that they more than offset the increased inflationary pressures from the 1981 tax cut."
The story being told here is now back where it began. Following the logic of the circular flow diagram, AD and AS are two sides of the same coin — they are not independent of each other. Our attempts to use the microeconomic concept of partial equilibrium analysis by shifting one curve, while holding the other in place, and then observing a new equilibrium price level and real output level simply does not explain what happens in the real world. Events which produce a movement along one curve, such as movement up or down the AS curve, also cause changes in income and expenditures and a shift of the AD curve.

Figure 2

Those of us who began examining American principles of economics texts thirty or more years ago, know that the AD-AS nonsense has been around for a relatively short period of time. For the sake of intelligent sophomores everywhere, it is our fervent hope that nonsensical AD-AS diagrams will soon disappear.
References


