Appendix B

A diagram might help visualize the sticky price theory in action.

Here is most of it: a cause-and-effect loop. A little more will be added later.

We keep it simple, adding just enough for our purpose: visualizing the sticky price theory.

Think of this as a simplified picture — a “model” — of how an economy works.

We call this the “Boom or Bust” loop.

Figure B1. Feedback Loop Explanation Provided to Group L (#1)

Take a moment to get the meaning of each term around the loop.

Figure B2. Feedback Loop Explanation Provided to Group L (#2)
Appendix B, continued

When things are increasing around the loop, the economy is growing. Follow steps 1-4 to see the Boom.

An economic slowdown could also occur. A drop in sales would lead to declines in labor, GDP, wages, and future sales. In other words, a Bust.

When sales, labor, GDP, and wages are steady (not changing), the economy is in equilibrium.

Finally, we add the “Turnabout” loop to prevent booms and busts from spiraling out of control.

It is controlled by the rise and fall of inventories -- goods in stock, awaiting sale.

But the red arrows are different. The letter “o” stands for opposite.
• When sales decrease, inventories rise faster.
• When inventories rise too high, business firms lower prices.
• When prices fall, sales rise.

Figure B3. Feedback Loop Explanation Provided to Group L (#3)

Figure B4. Feedback Loop Explanation Provided to Group L (#4)
Appendix B, continued

Key Points on the Turnabout loop:
• When GDP is higher than sales, inventories rise.
• When GDP is lower than sales, inventories fall.
• When prices are sticky, the Turnabout loop is slow, compared to the Boom or Bust loop.

The dashed arrow is a reminder that prices are assumed to be very sticky – averaging one year to adjust to inventory changes.

Figure B5. Feedback Loop Explanation Provided to Group L (#5)

To see how the sticky price theory works, we start in equilibrium.

In equilibrium, supply (GDP) and demand (sales) are equal.
Inventories and prices are stable

The graph below tracks changes in GDP, sales, and prices when they depart from equilibrium.

Figure B6. Sticky Price Theory Illustration Provided to Group L (#6)
Appendix B, continued

Suppose a drop in consumer confidence leads to a drop in sales. The graph shows the initial decline. We want to see what happens next.

Sticky price theory says that business firms will cut production before they cut prices, resulting in business cycles. In the following slides, let's see if this economic model helps visualize such behavior.

Falling sales lead to less employed labor, lower GDP, and lower wages. And falling wages cause another drop in sales and a continued downward spiral. The Boom or Bust loop “feeds on itself.” The economy shrinks. GDP falls below its long-run trend. Inventories must be rising since GDP is higher than sales. That’s why prices start falling, but slowly. Sticky prices slow down the Turnabout loop, preventing it from turning sales around.

Figure B7. Sticky Price Theory Illustration Provided to Group L (#7)

Figure B8. Sticky Price Theory Illustration Provided to Group L (#8)
During year 2...
Prices finally fall far enough to encourage more spending (sales).

Rising sales lead to
• more employed labor,
• higher GDP,
• higher household wages, and
• more sales in the future.

The Turnabout loop has reversed the momentum, and the economy is growing again.

Even though sales exceed GDP, most of the inventories added during year 1 have not been sold. Thus, prices continue to fall.

Figure B9. Sticky Price Theory Illustration Provided to Group L (#9)

During year 3...
The Boom or Bust loop is feeding on itself again, but this time causing growth.

Sticky prices remain low, giving sales an added boost.

Because prices are slow to adjust, the Turnabout loop is slow to curb sales and end the boom.

GDP is rising and returning to its long-run trend.

The low prices result from excess inventories that remain high as GDP keeps up with sales.

Figure B10. Sticky Price Theory Illustration Provided to Group L (#10)
Appendix B, continued

During year 4...

When will the upward momentum slow down and turn around?

It depends on how long it takes the Turnabout loop to raise prices and curb spending. If the loop is slow, GDP overshoots and rises above its long-run trend.

Sales are now higher than GDP, so inventories must be coming down. And that will put upward pressure on the sticky prices.

During year 5...

Prices finally turn up as sales pull inventories down faster than GDP builds them up.

Rising prices lead to:
- lower sales,
- less employed labor,
- lower GDP,
- lower household wages, and
- lower sales the next time around.

The Turnabout loop has again reversed the momentum of the Boom or Bust loop.

Figure B11. Sticky Price Theory Illustration Provided to Group L (#11)

Figure B12. Sticky Price Theory Illustration Provided to Group L (#12)
Beyond year 5...

GDP dips below its long-run trend line, but soon rises and approaches it again.

The interaction between the Boom or Bust loop and the Turnabout loop will continue, but less dramatically each year.

GDP will fluctuate less and less as inventories gradually return to normal and prices stabilize at a lower level.

The business cycle will run out of steam, and GDP will stabilize at its long-run trend.

Figure B13. Sticky Price Theory Illustration Provided to Group L (#13)

Research suggests that business cycles occur for many reasons. However, sticky prices seem to contribute to the up-and-down pattern.

The stickier the prices, the more GDP fluctuates around its long-run trend.

The quicker prices adjust, the sooner the Turnabout loop can reverse the momentum of the Boom or Bust loop, and stabilize GDP at its long-run trend.

Figure B14. Sticky Price Theory Illustration Provided to Group L (#14)