

sticky situation



Some prices are slow to change.

Are they sticky enough to affect monetary policy?

BY DOUG CAMPBELL

Even if you're not familiar with the term "sticky prices," you encounter them all the time. How many years has your newspaper sold for 50 cents a copy? No matter if interest rates are moving up or down, the price of your newspaper hardly ever changes — it's sticky.

Economists take for granted that some prices are rigid, slow to shift even as supply and demand conditions might seem to warrant. For many economists, these "nominal frictions" are enormously important, a core reason why monetary policy matters.

For other economists, however, sticky prices are neither widespread nor meaningful in the slightest for public policy.

Differences of opinion are humdrum stuff in economic circles. But on the issue of sticky prices, the level of disagreement is sharp and raises some exceptionally high stakes. Economists build mathematical models that are supposed to help policymakers decide when and how much to change interest rates. In recent years, sticky-price models have gained currency and are being used to inform Fed decisionmakers in setting interest rates.

But if sticky prices don't really matter for monetary policy, as some prominent economists theorize, then what use are sticky-price models to the Federal Reserve System?

More to the point: If sticky prices don't matter, does the Fed?

The behind-the-scenes debate about the importance of sticky prices is going on at the uppermost levels of economic thinking. Ben Bernanke, a Fed governor on leave from Princeton University's economics department, referred optimistically to the evolution of sticky-price models in a 2004 speech: "The insights from these types of modeling efforts are already informing policy analysis at the Board, and their influence will only grow as they become more detailed and realistic."

But where Bernanke sees promise in sticky-price models, others see inescapable flaws. Patrick Kehoe, monetary adviser at the Minneapolis Fed — whose president, Gary Stern, is a voting member in 2005 on the Federal Open Market Committee — suggests that economists ditch further research on sticky-price models. "No one has really yet made a convincing quantitative case for them," he says.

It is difficult to predict when, if ever, a resolution will happen. But how the sticky-price debate is settled may have significant implications for public policy.

A Sticky-Price Illustration

At the supermarket, the price of a box of brand-name cornflakes seldom fluctuates. For months it may be \$2.49, perhaps going on sale for \$1.99. As long as it stays at within those two bounds, the price of cornflakes is considered sticky.

Intuitively, you might expect more frequent price changes for a box of

cornflakes. Say it was a bumper crop year for corn — shouldn't the price of cornflakes then fall because of the increased supply? But for microeconomic reasons they don't budge. Firms must weigh factors like "menu costs" — literally, the cost of setting new prices as on a restaurant menu — and the psychological impact on customers who are accustomed to the old price. Simply put, prices tend to change only when it's financially advantageous for the producer to do so. Similar reasoning can be applied to changes in workers' wages.

The fact that prices don't continuously move is believed by many economists to be the key insight into how monetary policy can affect the economy. It is an underlying justification for so-called "monetary non-neutrality" — that is, why money matters. This is in contrast to "monetary neutrality," which posits that an increase in the money supply would simply be offset by rises in prices and wages.

When the Fed sets policy for the federal funds rate, it is influencing the growth of the money supply. If prices weren't sticky, and in the absence of other frictions, then theoretically the Fed's actions wouldn't matter for economic output. Put another way, if there's more money available with no change in prices, then consumers theoretically will buy more cornflakes. Cornflakes seem cheaper in this scenario. Conversely, if there's less money in circulation, shoppers will dial down their cornflake purchases since their price now seems high. Because prices don't

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immediately adjust, the Fed's behavior has the potential to affect the real economy.

The degree to which some economists believe prices are sticky tends to shape their beliefs on monetary policy. Sticky-price fans tend to be more optimistic about the potential importance of monetary policy, while sticky-price disbelievers often view monetary policy choices as relatively unimportant. At the same time, both sides are inclined to agree that price stability is the most desirable outcome of monetary policy — and generally don't subscribe to the old Keynesian notion that the central bank should use monetary policy to try to fine-tune the economy. It's just that sticky-price believers view monetary policy as effective because of the existence of sticky prices; the skeptics see monetary policy's powers as more wrapped up in how successful the central bank is at communicating its intentions and not surprising the market with wild fluctuations in interest rates.

Today, macroeconomists rely on intricate economic models to examine the impact of the money supply on the real economy. Those models in turn inform policy deliberations of the Federal Open Market Committee. There now exist two main schools of thought: one that thinks sticky prices matter and any modeling that doesn't use them will produce misleading results; the other that sticky prices don't matter and that standard real-business-cycle models work just fine, thank you very much.

These camps are neatly encapsulated in the views of two leading economists: Jordi Galí and the aforementioned Patrick Kehoe. In between is Alex Wolman, an economist with the Federal Reserve Bank of Richmond whose sticky-price research is widely cited.

The Believer

Galí is a professor at the Universitat Pompeu Fabra in Barcelona, Spain, who has concentrated on monetary policy and the business cycle. He is a

passionate believer that sticky prices play an important role in explaining how monetary policy works.

"Not only do they matter but they are probably the single most important reason why monetary policy plays such a central role in modern economics," Galí says. "In the absence of nominal frictions, monetary policy would be largely irrelevant and inflation and its costs a secondary concern at most." With that theoretical underpinning, Galí is forging ahead with research on the interaction between sticky prices and monetary policy rules.

Much of his work seems to debunk long-held views about how the business cycle works. For example, Galí and two co-authors argued in a recent paper that it's because of sticky prices that increased government spending may actually raise consumption among forward-thinking consumers.

This is in contrast with the prediction of standard "neoclassical" economic models, which suggest that such expenditures may not have this effect because individuals are farsighted and recognize that a government that increases spending today will likely have to decrease spending or raise taxes in the future; as a result, those consumers do not necessarily alter their consumption patterns. While Galí and his neoclassical colleagues may disagree over the empirical effects of increased government spending, both sides caution that economic analysis alone cannot determine whether such spending is desirable.

The Skeptic

Over at the Minneapolis Fed, Patrick Kehoe is doubtful. In reviewing the past two decades' work on sticky-price models, Kehoe sees rampant shortcomings. No work, he says, has succeeded in replicating output blips like those seen during the Great Depression. "Most people who play the sticky price game don't try to account for episodes in the data," Kehoe says. "The way the monetary literature has gone recently, they

Product/Services	Average No. of Months Between Price Changes
Newspapers	29.9
Haircuts for men	25.5
Beauty parlor services	22.9
Film processing	18.2
Cemetery lots	13.5
Paint	7.0
Computer software	5.5
Prescription drugs	5.4
Pet food	5.2
Beer	4.3
Cigarettes	4.1
Jewelry	3.7
Cereal	3.4
Women's footwear	3.0
Lunch meats	3.0
Ice cream	2.7
Frozen orange juice	2.4
Roasted coffee	2.2
Bananas	1.8
Women's dresses	1.5
Eggs	1.0
Airline fares	0.9
Tomatoes	0.8
Unleaded gasoline	0.6

SOURCE: Data selected from Bils and Klenow (2004)

seldom ask serious questions like that."

As ammunition, Kehoe points to some recent research on just how *un-sticky* prices in the U.S. market really are. In 2002, Mark Bils of the University of Rochester and Peter Klenow of Stanford University first reported findings from their look into a new trove of data: previously unpublished information on individual consumer prices collected by the Bureau of Labor Statistics. In aggregate, those data make up the consumer price index, compiled by government employees who literally observe prices of hundreds of individual products, from groceries to magazines, store by store. Bils and Klenow got special permission to review the micro-data on prices and concluded that these prices actually change quite frequently, on average about every four months. That doesn't seem so sticky, Kehoe argues. Additionally, Kehoe cites new research suggesting that when prices change, they do so in big chunks, much bigger than relative to what you'd expect based just on money shocks.

Thus to Kehoe, much of the work

on sticky-price models is pointless. Unable to produce results that match actual economic data, sticky-price enthusiasts are reduced to weakly arguing that their models can account for what happens after a monetary shock while admitting that monetary policy, broadly defined, accounts for only a tiny fraction of the business cycle, Kehoe says. “If that’s true, then why are we looking at it in the first place?” he asks with exasperation in his voice.

Galí counters the criticism that sticky-price models don’t explain periods like the Great Depression by referring to new variations of sticky-price models that have been enriched with features like habit formation and capital adjustment costs. In these models, “It is much easier to generate persistent output fluctuations, even in response to monetary policy shocks,” he says. Equally, Galí argues that just because he believes in the power of sticky prices doesn’t mean he thinks they’re the only important factor in the economy. “The fact that nominal rigidities play an important role in the economy does not necessarily imply that monetary policy shocks should be an important source of fluctuations; there are other shocks in the economy.”

The Moderate

On the matter of sticky prices, the Richmond Fed’s Alex Wolman is something of an agnostic. Wolman got in on the ground floor of modern sticky-price modeling through his serendipitous association with Robert King, then a professor at the University of Virginia, where Wolman was a Ph.D. student. King — now at Boston University and a consultant to the Richmond Fed — was at the forefront of incorporating sticky prices into equilibrium business cycle models.

Since the 1990s, Wolman has worked with both so-called “state-dependent” and “time-dependent” sticky-price models. In state-dependent models, firms essentially are presented with an economic choice about whether it’s a good time or bad time to switch prices, and the sole

criterion for making that decision is whether it will cost more to the firm to keep prices stable than to incur a menu-type cost to change them. By contrast, in “time-dependent” models, prices are automatically changed or not after a certain period.

“We as economists don’t know exactly how what the Fed does matters for the real economy.”

Wolman argues that state-dependent models are superior to time-dependent versions because they more accurately mirror the real economy. They don’t impose so much structure on firms as they allow them to decide when to adjust prices based on environmental conditions — whether it’s cheaper to leave prices unchanged or not. But the trade-off is that state-dependent models are more technically involved, so on occasion Wolman prefers to work with time-dependent models. Among other things, Wolman has used time-dependent sticky-price models to argue that the Fed isn’t powerless when nominal interest rates reach zero.

Wolman continues his research with sticky-price models. He is trying to both understand them better — especially their implications for monetary policy — and to advance them. As widely used as sticky-price models are today, they still aren’t all that well understood, he says.

Long-term, where Wolman sees the most promise is where Kehoe sees the most problems. The same Bils and Klenow data that showed shorter periods of time between price changes also show

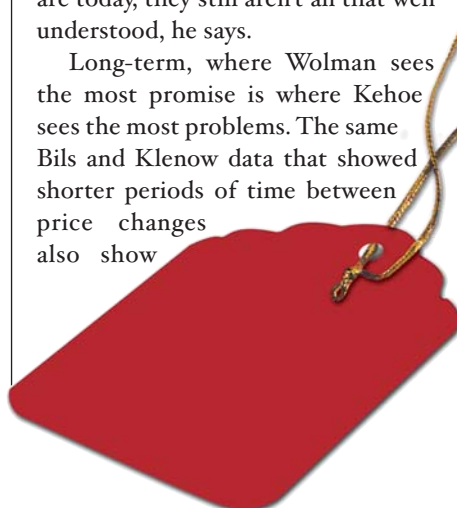
enormous variance, or “heterogeneity.” Wolman thinks sticky-price models can begin to incorporate the vast differences in how firms change prices — something that nobody has really accomplished yet. “It’s not straightforward to write down and solve models with those features,” he says. “What we need to understand is how that heterogeneity in the frequency of price adjustment matters.” The upshot, Wolman hopes, will be a model that produces results more consistent with actual economic data.

Building such a model is important because it will help us get at the central issue of this debate: the extent to which monetary policy and the Fed matter in the real world.

The irony that a monetary skeptic is serving as monetary adviser at a Federal Reserve bank is not lost on Kehoe. But he doesn’t necessarily see it as a conflict. To be sure, there is evidence that monetary policy run amok can severely damage an economy — witness runaway U.S. inflation in the late 1970s, a phenomenon many economists including Kehoe attribute to the Fed’s poor handling of the money supply.

At the same time, Kehoe thinks the reverence with which the U.S. Federal Reserve System is held by some may be overstated. The Fed cannot hope to smooth every blip in the economy with monetary policy, he says, because it doesn’t really wield that kind of power. The perceived failure of sticky-price models is case in point for Kehoe. “I could well imagine that monetary policy is important in a variety of ways, but I don’t think that the profession in general and sticky-price enthusiasts in particular have a handle on the mechanism by which it is,” he says. “I’m perfectly comfortable working at the Fed without thinking that the Fed can save the day for every recession and at the same time think it’s important to keep prices stable.”

Perhaps surprisingly, sticky-price enthusiast Galí somewhat shares that sentiment: “The presence of



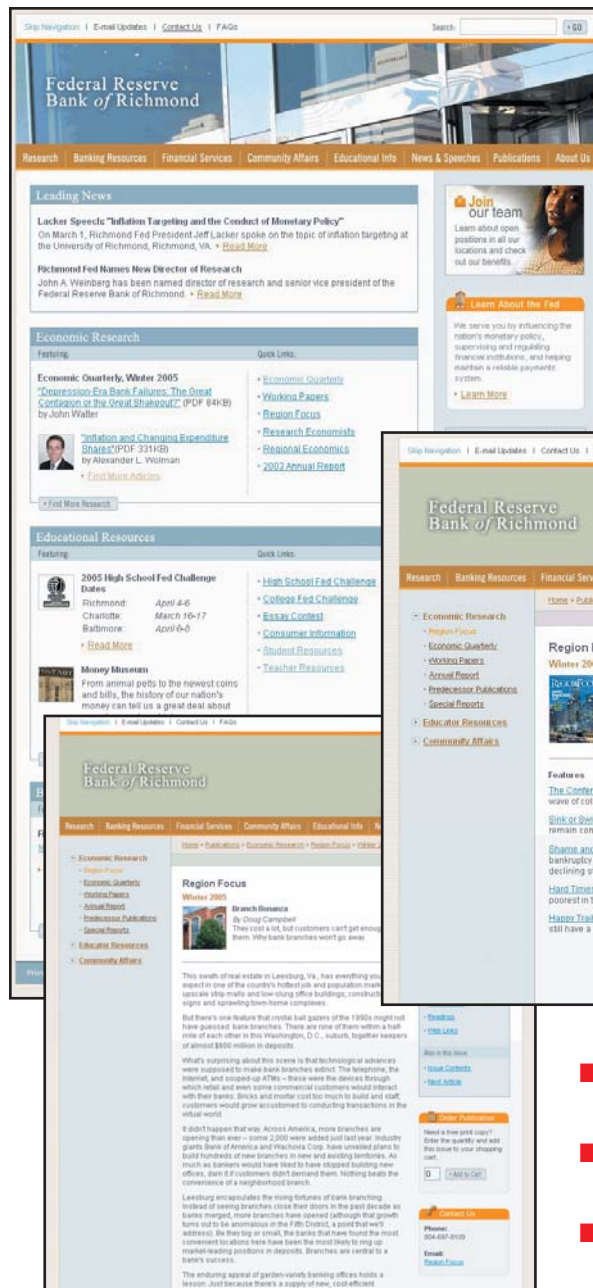
high and persistent levels of unemployment in many industrial economies can hardly be attributed to nominal rigidities. At most, monetary policy can provide a temporary patch.”

In other words: Monetary policy is not the cure-all salve for the economy that the popular media have lately told you about. Both Kehoe and Galí agree that it’s good for some things, but not all things — though Galí is more enthusiastic about it than Kehoe.

Their differences are nuanced but important. With regard to monetary policy, Kehoe is content to shoot for general price stability and then let the real economy work out other kinks on its own. Galí, by contrast, draws a strong connection between the existence of sticky prices and the effectiveness of monetary policy. Because of this, he has greater confidence in monetary policy’s ability to guide the behavior of the real economy.

Wolman isn’t all ready to give up on sticky-price modeling, but he thinks a lot more work remains: “I believe what the Fed does matters. But we as economists don’t know exactly how what the Fed does matters for the real economy.”

He pauses. “It’s slow going for people to reach a definitive conclusion about the effects of Fed behavior on the real economy. Hopefully, by gathering more data and building more models, we can become better informed about this question.” **RF**



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