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The TAYLOR RULE and the Transformation of Monetary Policy

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A VIEW FROM THE FINANCIAL MARKETS

John P. Lipsky

John Taylor's[1] important contributions to understanding the interactions between financial markets and economic policy have been highly relevant to financial market participants; John personally has sought to model these interactions in a way that few others have. He has been a frequent visitor to financial institutions in order to test his views against actual practice. Thus, the practical relevance of John's work has not been accidental.

In fact, the importance of John's work was recognized by financial market participants at least as rapidly as by academic colleagues. Consider the paper that introduced what is known everywhere today as the Taylor rule for monetary policy. It was presented first at a November 1992 Carnegie-Rochester conference in Pittsburgh and was subsequently published as a Working Paper of the Center for Economic

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1. I believe that I have known John and his wife, Allyn, longer than most. So I can vouch personally for something that I'm sure those who know them have long realized: John's many accomplishments owe much to Allyn's support. As a Stanford classmate of John's and on behalf of John's classmates—incidentally, he was the first of us to finish his degree and to head off to at least the academic version of the real world—I can state that we're proud of what he has accomplished, but not surprised.

Policy Research at Stanford (now SIEPR) with the title "Discretion versus Policy Rules in Practice."

Please think back to mid-1993. At that time, the funds rate was 3 percent, where it had been lodged since 1992. The economic recovery from the 1990–91 recession had been more sluggish than had been generally anticipated. Fed Chairman Alan Greenspan blamed the headwinds that seemed to be holding the economy back. However, it's easy to forget that the Consumer Price Index inflation was 3 percent and ten-year Treasury bond yields were about 6 percent.

At that time, I was working on Wall Street as the chief economist of Salomon Brothers. My Salomon Brothers colleagues and I became convinced that Fed policy was becoming too accommodating and that tightening was needed. This view was not shared at all by most financial market participants, and it was not reflected in market prices. We were searching for a clear and systematic argument in favor of our view that policy tightening was needed. And that's how we came to incorporate into our own work the analysis in John Taylor's Carnegie-Rochester paper only a few months after its initial presentation.

We had been struck by how well Taylor's formulation matched the Fed's record from 1987 onward. But if you look at figures 1A and 1B in Don Kohn's paper in this volume, you'll see that the Taylor rule in late 1993 provided a clear indication that Fed policy was overdue for tightening.

I'm going to read to you a few quotes from the December 1993 edition of Salomon Brothers' annual *Prospects for Financial Markets*. The specific title of the 1993 edition was "Keeping Inflation Low in the 1990s." I believe that this quote reflects the first practical use of what came to be known as the Taylor rule. At the same time, the quotes will remind you how far we have come in thinking about monetary policy goals and operations from the then-prevailing conventional wisdom. You will also recognize the impact of the analysis that underpinned the development of the Taylor rule.

In a section of the 1993 *Prospects* entitled "The Fed's Inflation Test," we claimed that the key element in the United States' historic post-1970s disinflation was the Federal Reserve's three waves of monetary restraint implemented during the 1980s. In that vein, we stated, "Fed policy largely will determine whether the trend of declining inflation cycles will be sustained." We warned, "The lack of a clear-cut monetary policy guide still creates cyclical inflation risks. Forward-looking indicators signal that current Fed policy will have to be tightened soon if any eventual inflation revival was to be kept modest and short-lived.

"Nonetheless, the prospect of timely Fed action—together with cyclical and structural forces—justifies optimism that long-term inflation expectations will continue to trend downward, eventually pulling long-term interest rates to new lows." We continued, "If the Fed meets its inflation goals—namely, if monetary policy's success would become a reality rather than an abstract mantra—further significant declines in U.S. long-term bond yields would be likely. For example, if inflation retreats to an average of 2 percent or less, long-term Treasury bond yields above 6 percent would offer substantial value. If the prospect of sustained low inflation eventually gains credibility, not impossible considering that consumer price inflation has been 2 percent or lower through six of the past ten decades, even long-term bond yields below 5 percent would be possible in the coming years."

That sounds archaic, doesn't it? We continued, "At present, however, market participants increasingly are skeptical of the Fed's prospective success. Despite the drop in inflation, the Fed's primary task for more than four years has been accommodation. To many observers, therefore, the recent progress in reducing inflation does not reflect new Fed initiatives as much as other factors.

"Some analysts argue that the Fed's policy was tighter than indicated using traditional measures and probably was tighter than the Fed had intended. Such [a view] has been encouraged among other things by a recent study indicating that until last year, the Fed's policy actions were consistent with an implicit 2 percent inflation target, but its failure to hike rates during the past year has called into question the stringency of the Fed's policy goals."

Of course, the "recent study" we footnoted was "Discretion versus Policy Rules . . ." This may not have been the first citation anywhere of John's seminal paper, but for sure it was the first practical use of the analysis—and well before the Taylor rule had been christened with its now universally recognized name.

These quotes date from mid-December 1993. Chairman Greenspan testified in Congress on January 28, 1994. Although journalists seemed to hear an unclear message that day, my Salomon Brothers colleagues understood him to be warning that a rate hike was imminent. In response, we went around our trading floor warning, "The Fed is coming! The Fed is coming!" And on February 3 came the market-shocking twenty-five basis point rate hike.

To our chagrin and frustration, Salomon Brothers suffered massive losses, principally on the mortgage-trading desk. It was a searing moment. Not only had it been demonstrated vividly how unconvincing we had been with our trading colleagues, it also underscored how counterintuitive our Taylor-rule-encouraged conclusions had seemed at the time.

I don't say this as a sort of bitter self-congratulation—after all, we had failed, in that we hadn't been convincing enough to allow our firm to benefit from our non-consensus but accurate forecast—but to highlight how Taylor rule-type reasoning at the time was anything but conventional wisdom. Today, in contrast, such an approach strikes most market participants as nothing more than codifying the obvious. And virtually all central banks today—like the economic research groups of virtually all major financial institutions—maintain their own Taylor rule calculations to provide perspective on their policy decisions. Surely, this is the mark of a powerful insight.

Parenthetically, residential mortgage-backed securities at the time were still a relatively new asset class. The early versions of these securities mainly were designed to translate changes in mortgage interest rates into securities prices. When the Fed raised rates in early 1994, it became clear that many financial market participants had a very imperfect understanding of how changes in Treasury bond yields would alter prices for mortgage-backed securities.

Despite the massive losses absorbed in 1994 by Salomon Brothers and others, lessons were learned. Today, conventional mortgage-backed securities form an important part of modern financial markets. The current bout of difficulties with mortgage-backed securities deals primarily with a newer family of instruments (that include so-called "non-conforming" mortgages, among other elements) that also map changes in credit quality into market prices. At present, we can see that practitioners have had difficulty in understanding that mapping. That doesn't mean that securities like collateralized debt obligations (CDOs) have no useful role, but rather that market participants have serious lessons to learn from the latest difficulties.

Returning to the situation in 1993, it is easy to see how significantly thinking about monetary policy has developed under the influence of John Taylor and others. Following John's and others' research, my Salomon Brothers colleagues and I argued that earlier reliance on M1 was outdated. We claimed that the Fed also had lost an anchor in M2, at a time when the Fed was still relying on something called P-Star analysis. That analysis was based on the notion that there was a predictable long-term relationship between M2 and the price level. But that analysis had substantially over-predicted the inflation decline that had occurred at that time. Thus, we concluded—based in part on John's work—the evidence indicated that policy was overly accommodating.

To demonstrate this conclusion, we used John's formula (duly footnoted) to show graphically that if the economy were at full capacity, growing at trend, and if the Fed were aiming at price stability, the nominal funds rate should lie between 2 percent and 4 percent. Given the circumstances at the time, this analysis indicated clearly that a 3 percent funds rate was too low to be consistent with a presumed 2 percent long-term inflation goal. In fact, we claimed that the deviation between the actual funds rate and that indicated by John's formula was approaching a magnitude that in the past had been associated with accelerating inflation.

It's worth noting the obvious: the Fed responded by a notable policy tightening during 1994 and beyond; financial market participants altered their views about monetary policy decisions and they altered their expectations of Fed actions. Most importantly, the economy subsequently outperformed consensus expectations in terms of stronger growth and lower inflation.

In sum, while the early 1980s effort to lower U.S. inflation had strong monetarist overtones, anti-inflation logic subsequently has rested much more on Taylor rule logic regarding the practical combination of formal inflation targeting (or the setting of medium-term inflation goals) plus output gap considerations. Moreover, the rapid securitization of capital markets has reduced sharply the potential temptation of governments to use inflation as a policy tool, as the negative financial market reaction to heightened inflation risks has become more powerful. With the benefits of low and stable inflation more clearly acknowledged, the case for central bank independence has become recognized more widely. This occurred not just in advanced economies, but in emerging market economies, as well.

I also would like to highlight a June 1995 Salomon Brothers publication entitled "Policy Rules Shed New Light on Fed Stance" authored by my then-colleague Robert DiClemente. As far as I can ascertain, this publication represented the first time that we referred to the Taylor rule in print using this name (although we had referred to it frequently in generic terms, always footnoting the original Taylor paper). My modest claim is that we at Salomon Brothers were the first anywhere to apply the name Taylor rule to John's seminal monetary policy formula.

In that 1995 publication, we examined the prospect that policy rules could improve monetary policy performance. The publication focused on three rules that we defined by the authors' names: the Taylor rule, the McCallum rule—which uses monetary base growth as the instrument—and the Judd rule that calculates the needed change in short-term interest rates as a function of the difference between actual and targeted nominal income growth.

This publication stated, "The historical perspective of the Taylor rule underpins the general usefulness of this approach to assessing policy. Funds rates calculated with the Taylor formula dating back in time indicate the sharp change in monetary policy that occurred with the strong anti-inflation commitment introduced in October 1979. Virtually throughout the periods since 1980 the actual funds rates has been at or above the level prescribed by the Taylor rule. All of the rules that we have considered indicate that Fed policy may have become too accommodating during the latter stages of easing in 1992."

The publication illustrated that the funds rate in the fifteen years leading up to the 1979 policy shift was continuously below that prescribed by the Taylor rule, even when the funds rates moved above 10 percent late in the decade. Thus, it stated, "The illusion that interest rates were high at that time is not borne out by the rule. The mirror of this illusion may have been at work recently when many market participants judged that a 6 percent funds rate was unlikely to yield much slowing in economic momentum, while the rule characterized policy as appropriately positioned to head off serious inflation."

My concluding points are consistent with John's work on the international aspects of monetary policy encompassing both the globalization of policy approaches and the effect of globalization itself on policy choices. It's clear that John's work has had a substantial effect on the way monetary policy is conducted around the world.

At Salomon Brothers in 1993, we thought that it was novel and noteworthy to assert that the Fed was likely to take its anti-inflation goals seriously. At the time, only a few other central banks would have been characterized as serious about inflation goals. Yet what has been referred to as the Great Moderation has been associated with the spread of inflation-focused central banks operating with much greater independence than was the case previously.

Economies and financial markets also have changed importantly since 1990. After all, it's only since 1990 that we have operated in what can reasonably be called a truly global trading system and a global financial market. This is very new by historic standards, but already it is having an effect on economic performance.

In Chairman Greenspan's 2007 book and in some of his recent quotes, he's called into question whether the current favorable environment can be sustained. Contrary to consensus expectations following the 2000–01 slowdown, this has become the most rapid and best-balanced period of global growth in many decades, while core inflation has remained low.

It's clear that we can't take this exceptional performance for granted going forward. In fact, it seems to me that we are now at the initial moment of a new policy debate and the conduct of monetary policy very much will be involved.

Rapid productivity growth and the international conditions of opening markets and improving policies that helped catalyze the Great Moderation have made it much easier for policymakers to initiate an economic and financial virtuous circle, featuring smoothed output fluctuations and reduced inflationary expectations. However, we simply can't assume conditions will remain this favorable indefinitely.

What is the future of the Great Moderation?

If conditions become less favorable, we should anticipate some major challenges.

First, it can't be taken for granted that the prevailing view will be retained that low and anchored inflation produces the best economic results. On several levels, it is possible that the support for anti-inflationary policies could erode. We are at a point at which potential challenges should be taken seriously.

The key economic and policy challenges facing us are going to be global, and not just domestic. Among other things, the role of policy coordination will need to be rethought. Somewhat neglected issues such as exchange rates and international payments imbalances will need to be dealt with effectively. Simply put, we can't take for granted a continuation of the environment that has benefited the global economy so dramatically in the past several years despite recurring challenges.

We at the International Monetary Fund are hard at work trying to help establish and sustain a favorable global environment. The nature of the challenges that lie ahead is relatively clear, but their parameters are not. There are difficult but crucial aspects that will require support and cooperation from policymakers around the world. And there are aspects that will require insights from the academic community to help provide guidance. Among other things, I know that we will be looking to John for innovative views and wisdom and from all of you here as well.