

## THE EMERGING ROLE OF EXPECTATIONS IN CONDUCTING AND COORDONATING MONETARY POLICY

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### 1. The theory of expectations

Economists have long recognized that expectations play a prominent role in economic decision making and are a critical feature of macroeconomic models. However, they disagree about the basis on which individuals form expectations and thus about the way to model them. For example, the conventional view is that current consumption spending depends partly on how large or small consumers expect their future income to be. But economists are not in accord over exactly what information consumers take into account in forecasting future income.

The debate continues, partly because obtaining data on expectations is difficult. For example, surveys of expectations are limited to a few economic variables, such as inflation, and it is unclear whether the surveys accurately measure the expectations that influence actual decisions. In some instances, expectations can be inferred from non-survey data. Expectations about future short-term interest rates, for example, can be inferred by comparing the yields on bonds of different maturities, given the assumption that a bond's yield depends on the sequence of short-term interest rates expected over its term to maturity, plus a term premium.

However, this approach provides accurate measures of expectations only if this theory of the term structure of

interest rates is itself correct and if term premiums can be reliably estimated.

The lack of adequate data has meant that builders of macroeconomic models have had to specify a priori how individuals form expectations (box 1 "Assumptions about the Ways in Which Expectations Are Formed"). Most models developed in the 1960s and 1970s, incorporated the simplifying assumption that people form expectations *adaptively*. Under this assumption, for example, the expectation for inflation in the next year is based on the recent inflation trend. Similarly, expected interest rates depend on past interest rates.

Starting in the 1970s, a number of economists strongly criticized this treatment of expectations in macroeconomic models. Robert Lucas, in what has become known as the "Lucas Critique," argued that analyzing alternative monetary and fiscal policies using these models is of questionable value because the adaptive approach fails to recognize that, in the real world, people are likely to modify their expectations as policies are changed.

According to Lucas (1976) and others, individuals have economic incentives to form accurate forecasts of future economic events, and such forecasts include the anticipated effects of the government's macroeconomic policies. If the Federal Reserve usually lowers interest rates during recessions, for example, then individuals facing the

onset of a recession will base their forecasts of future interest rates on the systematic relationship between the cyclical state of the economy and interest rates.

Because of the criticism of adaptive expectations, the assumption of *rational expectations*, which had first been proposed in the early 1960s, gained favor among many macroeconomists. In a given macroeconomic model, expectations of future events are rational if they are identical to the forecasts of that model. Because it posits that individuals make full use of all of the information embodied in the structure of a macroeconomic model, the rational expectations approach has become one benchmark for the estimation of unobserved expectations.

Cost–benefit analysis provides a useful perspective on this debate. In the view represented by models employing adaptive expectations, either the costs of sophisticated approaches to forming expectations are high, or the benefits from improved forecast accuracy are slight. Thus, individuals form their expectations of the future using simple rules of thumb or easily computed formulas, such as adaptive expectations. At the other extreme is the view underlying the rational expectations approach. In this case, collecting and analyzing information is assumed to have small costs and large benefits, and

consequently individuals base expectations on sophisticated forecasting models that make use of all relevant data.

Between these extremes is the view that forecasting has both significant advantages and significant costs. Such a circumstance should lead households and firms to choose forecasting models that closely resemble their economic environment but fall short of a complete model of the economy in every detail. In FRB/US model, one of the options for expectations formation, referred to as *VAR expectations*, is motivated by this view.

## 2. Role of expectations

Recent contributions in the literature have enhanced our understanding of the finer monetary policy details and advanced technology has allowed us to formalise the paths through which expectations affect inflation. The design and implementation of monetary policy have been clear beneficiaries of these advancements.

The role of expectations in the economy has been the spring board for the extensive rules (commitment) versus discretion discussion. It has been advocated therefore, that a Central Bank that announces the rules based on which it decides its actions, commits to a certain path which is understood by everyone.

### Box 1 Assumption in which expectations are formed

Macroeconomic models have relied on several different assumptions about how individuals form expectations of future economic conditions:

*Adaptive* expectations depend only on past observations of the variable in question. Most econometric models developed in the 1960s and 1970s, including the MPS model, employed this assumption.

*Rational*, or model-consistent, expectations are identical to the forecasts produced by the macroeconomic model in which the expectations are used. This assumption has been used in many macroeconomic models developed in the past fifteen years and is one option for the formation of expectations used in FRB/US.

*VAR* expectations are identical to the forecasts of a small vector autoregression (VAR) model that includes equations for a few key economic measures. This is another option for expectations formation used in FRB/US.

*Adaptive and VAR expectations* may be rational if they are used in a macroeconomic model with a coinciding structure. For example, if actual inflation depends only on past inflation, then adaptive expectations of inflation will be rational.

Expectations, the argument goes, are then tied to that level of inflation that is consistent with the rule followed. This, as has been shown extensively in the literature, can produce superior results in terms of society's welfare. The difficulty with such an approach however, is that it might suffer from the problem of time-inconsistency in the sense that, as it is impossible to predict all likely outcomes that could happen in advance, committing oneself to a specific operational rule runs the risk of never being applied. Discretion, on the other hand, allows all the flexibility that events warrant, but then at the cost of not necessarily helping expectations move in the desirable direction. The merits of commitment therefore, pull against the time-consistency of discretion. Central Banks themselves, although always in favor of reaping the benefits of having committed, worry about the fact that in real time, it is not always easy to assume that they are in such a position.

In actual decision making therefore, they need to allow for the possibility that private sector expectations are not the result of past

pre-committing policies, but are instead updated beliefs based on the information the private sector has at any given point in time. To allow for this worry, we will consider a discretionary set-up in the sections that follow, and thus separate the formation of expectations from actual policy making.

What becomes important then, is to know how these expectations are formed and what authorities can do to address resulting inefficiencies. The timing of the game assumed will therefore, have shocks occur first, then private agents form expectations based on information available about these shocks and policy objectives, and finally the central banks forms policy.

Regarding the coordinations of the monetary policy, in our opinion, it is very interesting to debate if the central bank must publish it's own forecast for the monetary policy interest rates. This problem recently came to the fore of the debate following the decision of Sweden's central bank, the Riksbank, in 2006 to join the central bank of Norway and New Zealand, in publishing the forecast of its policy rate. Even among

those central banks that have explicit inflation targeting policy regime, the practice of publishing the forecast of the policy rate puts these three countries (New Zealand, Norway and Sweden) and the vanguard at the trend towards greater central bank disclosure. Another's inflation – targeting central bank, Bank of England, has been less willing to go down this route.

The Bank of England position is at odds with a body of work in the academia and policy circles that has advocated forward – looking guidance by the central bank on its future actions as a way to enhance effectiveness of monetary policy. The argument starts with the observation that the central bank generally controls directly only the overnight interest rate. The links from the overnight interest rate – the direct level of monetary policy – to the prices that matter, such as long term interest rates, depend almost entirely on market expectation, and monetary policy is effective only to the extent that the central bank can shape the beliefs of the market participants.

A second plank in the argument for the central bank providing guidance on its future actions is some version of expectation theory of the yield curve – in other words, that long term interest rates are determined by market participant expectation's of the future course of short term rates set by the central bank. By charting a path for future short rates and communicating this path clearly to the market, the central bank can, it is argued, influence market expectations, thereby affecting mortgage rates, corporate lending rates and other prices that have a direct impact on the economy. Having thus gain a lever of control over long-term rates, monetary policy works through the IS (investment – savings) curve through quantities such as consumption and investment.

Indeed, as many commented, the management of expectations is seen by many leading monetary economists of

the expectationalist school and the task of monetary policy. For Svensson (1999, p. 1) “monetary policy is to a large extent the management of expectations”, or as Woodward (2005, p. 3) has put it “not only do expectations about policy matter, but, at least under current conditions, very little else matters”. The arguments are laid out particularly clearly in a policy speech given by The Federal Reserve Governor, Ben Bernanke (2004), entitled *The logic of monetary policy*. In this paper, Bernanke explores the analogy between driving a car and steering the economy through the monetary policy. The economy is a car, The Federal Open Market Committee (FOMC) is the driver, and monetary policy actions are akin to taps on the accelerator or the brake in order to stimulate and cool the economy as appropriate, based on its current state. Bernanke notes that while this analogy is superficially attractive, the analogy breaks down due to the importance of expectations of future actions by the central bank. If the economy is like a car, then it is a car whose speed at a particular moment depends not on the pressure on the accelerator at that moment, but rather on the expected average pressure on the accelerator over the rest of the trip.

In addition to the argument that monetary policy is more effective when central banks disclose the path of their future policy rates, there is also an argument that appeals to consistency. Rudebusch and Williams (2006) examine the current practice of some inflation – targeting central banks at arriving of forecasts of inflation and output that are based either on the assumption that the policy rate will remain constant, going forward, or on the path of the policy rate as revealed on the market prices of short – term interest rate futures contracts. If the central bank knows that its own forecast diverges from either or both these paths, then the central bank's own forecast of inflation and output will build in an inconsistency.

Thus, in addition to the reasons arising from policy effectiveness, even from the viewpoint of consistency, the disclosure of future expected policy actions is seen as being desirable.

### 3. Expectation theory of the yield curve

As we have already seen, the most important plank in the argument for the desirability of publishing guidance on the future path of central bank policy rates is some version of the expectations theory of the yield curve. According to this theory, long-term interest rates are determined by the expectations of the future path of short-term rates. It is through this channel that the central bank gains a lever over prices that matter – in particular long-term rates that determine the key interest rates that determine mortgage rates, corporate lending rates and so on. While there is some empirical support for the expectations theory of the yield curve, the evidence is mixed. Gerlach and Smets (1995) find supporting evidence for the expectations theory for a number of European countries, but there is little evidence for it for countries that host the major financial markets.

Indeed, in a paper published 25 years ago, Shiller et al. (1983, p. 174-175) summarize the state of discussion on the expectations theory in the following unflattering terms: *“the simple expectations theory, in combination with the hypothesis of rational expectations, has been rejected many times in careful econometric studies. But the theory seems to reappear perennially in policy discussions as if nothing had happened to it. It is uncanny how resistant superficially appealing theories in economics are to contrary evidence. We are reminded Tom and Jerry cartoons that precede feature films at movie theatres. The villain, Tom the cat, may be buried under a ton of boulders, blasted through a brick of wall (leaving a cat-*

*shaped hole) or flattened by a steamroller. Yet seconds later, he is up again plotting his evil deeds”.*

When considering the workings of financial markets and the motivation of traders, the failure of expectation theory of the yield curve is perhaps not a surprise. Although it is very plausible that central bank guidance is the pivotal factor in pricing out one or two years in the yield curve, it seems more of a stretch to believe that that longer-term rates are determined by traders' expectations of central bank actions in the distant future. When hedge funds and fixed-income traders trade ten-year swaps, could be plausible believe that they are influenced primarily by their beliefs of central bank policy seven, eight or nine years from today? Evidence from the markets tends to undermine such a hypothesis.

Even among those central banks that have begun to publish the forecast of their future policy rates, the markets have not always taken the cue from the central bank's forecast in setting prices. Goodhart (2007) notes that when the Norges Bank (Norway's central bank) published its interest rate projections in autumn 2006, very short-term rates fell into line but the longer ones did not. The expectations theory of the yield curve seems even less secure in the face of such evidence.

### 4. The compliance between intersubjective and rational expectations

There is an extremely important point to be drawn out of the discussion for the institutional and constructivist analyses of applications of rational expectations theory in economic and monetary affairs. More precisely, it is that intersubjective expectations rather than rational expectations *per se* generate stable, predictable, and cooperative outcomes between market actors and those who seek to affect market outcomes.

As Mark Blyth has already pointed out, Keynes understood, and some (particularly theorists of rational expectations) have chosen to forget, market actors are non-rational and myopic as often as they are rational and calculating. They look to one another for signals to inform their own market transactions (Blyth, 2003). Markets react adversely against information and signals (such as signals from the central bank) if the information or signals are contrary to the conventional expectations of market actors. In this context: *“conventions are intersubjective understandings shared by market actors that specify how markets are supposed to behave...they are sociological constructs.... Market behavior therefore rests on the coordination of agents, expectations through the maintenance of conventions. So long as intersubjectively held conventions regarding the economy are adhered to, then the economy will perform within the parameters of the expected conventional judgment. In sum there is no truth about markets out there apart from the prevailing wisdom markets have about themselves”* (Blyth, 2003 p. 257).

Thus not only are the expectations that coordinate market behavior based upon intersubjectively shared social understandings, rather than rational expectations, these intersubjective expectations have constitutive effects, per Alexander Wendt's (1992). Wendt distinguishes constitutive from causal effects and argues that “ideas or social structure have constitutive effects when they create phenomena – properties, powers, disproportion, meaning – that are conceptually or logically dependent on those ideas or structures that exists only in the virtue of them”. Because market actors so often act on the basis of the “truth” of their intersubjectively understandings and expectations, what the markets believe to be the case on the basis of these expectations is indeed the

case. Market stability then relies upon intersubjectively held conventions, and “change occurs when expectations diverge and conventions falter” (Blyth, 2003 p. 257).

We see countless examples of the reliance on intersubjectively shared cognitive conventions in the literature across topical areas of economics to explain how the behavior of market participants diverges from the behavior predicted by rational expectations theory. A decade ago, for example, in an early contribution to a now burgeoning literature on investor psychology, Yale economist Robert Shiller, however unconsciously, invoked intersubjectively shared cognitive conventions to explain speculative booms and crashes in quite similar terms: *“now it should be recognized that if market participants think that investor psychology is the cause of stock market movements, then that is the view that informs their actions, and then, indeed, market psychology is the cause of stock price movements”* (Shiller, 1996 p. 71).

What the markets believe has a causal effect on market behavior. And what the markets believe can be quite unrelated to their analyses of fundamentals of the real economy. Markets participants rely the confidence in intersubjectively shared conventional understandings that the present is understood and the future may be predicted. As economist Charles Kindleberger has suggested, “a change in expectations from a state of confidence to one lacking confidence in the future is central” (Kindleberger, 2000 p. 91). This is how asset bubbles so quickly become panics, crashes or busts. A rising tide of wholly irrational expectations about future rewards can carry along investors, many of whom look to one another's behavior for signals rather than performing fundamental cost/benefit or risk/reward analyses of their own guide their investment decisions. When does a mania become a

panic and a crash? Kindleberger answers simply *someone else*. No great amount of high-powered, rational, technical, or quantitative analysis has been conducted by any market actor to reverse market fortunes: “ *causa proxima* is some incident that snaps the confidence of the system, makes people think of the dangers of the failure, and leads them to move...back into cash. In itself, *causa proxima* may be trivial: a bankruptcy, a suicide, a flight, a revelation, an refusal of credit to some borrower, some changes of views that leads a significant actor to unload. Prices fall. Expectations are reversed” (Kindleberger, 2000 p. 100).

### 5. Conclusions

The soundness of monetary policy decisions is not solely determined by their own worth. By implication, policy mistakes alone are not always enough to produce long term negative effects on monetary stability and by the same token, correct decisions do not suffice to guarantee successful results. In both cases, what people believe about these decisions and subsequent policies, is just as important. This point stems from Phelps' contribution to the concept of

higher order expectations and their relevance to the final outcome.

That said then, Central Banks acquire a dual role: the first is naturally to assess the conditions at hand, and make as sound decisions as their information and skills allow; but equally important is the second task, which is to inform and convince the public about the value of their intentions.

We describe then monetary policy as an information game to capture this latter role, and argue that providing a clear inflation target helps agents coordinate at the desirable level. Issing (2002) has been emphatic in pinpointing the relevance of such explicit quantitative targets in monetary policy implementation. It is important to appreciate however, that no regime can be evaluated in spite of the economic environment it operates in.

Our analysis shows that in the presence of unstable economic conditions, announcing a clear inflation target cannot be the incontestable nostrum. This is then in line with Goodhart's appreciation of the, at times necessary, lack of correspondence between monetary theory and monetary practice, emphasised also by Issing.

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