

Coordinating Expectations in Monetary Policy*

Stephen Morris Hyun Song Shin

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1. Introduction

The last fifteen years have seen a remarkable revolution in both the conduct of and the common understanding of monetary policy around the world. This revolution has encompassed instruments, with an increased emphasis on transparency about short and medium run central bank policy planning and decreased emphasis on intermediate targets such as monetary aggregates. This revolution has also encompassed objectives, with an increased emphasis on medium run inflation targets. However, the objective question cannot be separated from the instrument question. In particular, inflation targeting is seen as a key component of transparent monetary policy.

At the heart of this revolution is a change in perspective about what monetary policy is all about. The traditional perspective viewed monetary policy as an engineering problem. The central banker had a set of instruments under his control, faced uncertainty outside his control and sought to manipulate his instruments to achieve targets. The modern perspective views monetary policy as a strategic

*This paper was prepared for a November 2006 conference of the Cournot Institute on "Central Banks as Economic Institutions." Both authors are at the Department of Economics, Fisher Hall, Princeton University, Princeton, NJ 08544-1021, U. S. A.

problem. Most of the action comes neither from instruments under the direct control of the central banker, nor from exogenous uncertainty outside his control, but rather from the actions of market participants who are mostly concerned about variables outside the direct control of the central bank – e.g. long term interest rates – but are acutely aware that everyone else is looking at the central bank for clues about where those variables are headed. As Michael Woodford (2005, p. 2) has put it, “central banking is not like steering an oil tanker, or even guiding a spacecraft, which follows a trajectory that depends on constantly changing factors, but that does not depend on the vehicle’s own expectations about where it is heading.” Charles Goodhart has coined the term “expectationalists” to denote this school of thought that includes not only Michael Woodford, but other leading monetary economists such as Alan Blinder, Lars Svensson, and Ben Bernanke.

In this view, monetary policy is – at its heart – the problem of managing and coordinating expectations in the economy. The instruments under the direct control of the central bank – such as overnight interest rates – are less important than the messages the central bank sends. But how easy is it to use communication to manage and coordinate expectations and what are the costs and benefits of doing so? Most readings of the evidence of the last fifteen years suggest that it is possible to do so and that the benefits outweigh any costs. Nonetheless, a recent theoretical literature has identified some potential costs and difficulties in trying to coordinate expectations. Sometimes these costs seem related to the concerns expressed by the old-fangled secretive central bankers about talking too much. Sometimes these costs offer some insights into the “limits of transparency,” i.e., the question of how much should be made public. The first part of this paper will review some of these arguments from our earlier work. The second part of the paper will discuss how these arguments may relate to some current debates on central bank communication policy.

The type of theoretical models of social value of information and optimal communication in strategic settings that we will describe assume away too much institutional detail and microfoundation to offer concrete lessons for the design of central bank policy. On the other hand, we believe it is fair to say that the theoretical models that monetary economists use to debate inflation targeting and transparency assume away too much about strategic interaction and expectations formation to adequately address the concrete questions. We would say – especially to our academics colleagues – that research has not caught up with the revolution in monetary policy practice, and there is much work to be done.

2. Coordinating Expectations

An economy consists of a large number of economic actors making individual decisions. Since Adam Smith, we have been aware of the remarkable role prices and free markets can play in coordinating those decisions into a balanced and perhaps efficient outcome. Each actor cares greatly about what others will do. But in our models of perfect competition, market prices – and the ability to transact freely at those prices – allow each actor to understand and analyze the market without worrying about what other actors will do, and therefore without worrying about what they think.

However, the price level creates special difficulties. There is a fundamental indeterminacy in the level of prices. When businesses set prices, they must form beliefs about how others are setting prices now and in the future. How others set prices will depend on what they think about inflation, and so on. When traders take positions in the financial markets, they must form beliefs about the evolution of short run rates, knowing that short run interest rates in turn are influenced by market expectations. Beliefs may be self-fulfilling and - in the absence of good monetary policy – there may be excessive levels and volatility of

inflation. Thus it is no coincidence that monetary policy in particular is subject to much commentary on how people are interpreting it, how they think others are interpreting it, and so on. There is a large coordination dimension with – in the absence of good monetary policy – much indeterminacy in outcomes.

Economists employ the suggestive metaphor of the “sunspot” to understand outcomes in such settings. Suppose that sunspot activity were observed by everyone in the economy, and when sunspot activity was high, economic actors expected inflation to be high and – we are still living in a world of bad monetary policy – this led them to set high prices which translated into high inflation. Whereas when sunspot activity was low, economic actors kept prices rises small and there was low inflation. In this world, sunspot activity has no intrinsic relevance for inflation. From the viewpoint of each individual actor, sunspot activity happens to be a good predictor of others’ pricing behavior, and thus becomes an important determinant of their pricing decision.

Let us pause to ask what features of these metaphorical sunspots would allow them to coordinate expectations in this economy. we noted that they must be observed by everybody. But more is required: it must be common knowledge among actors in the economy that everyone is observing the sunspot, and everyone is acting on the sunspot in the same way. To stretch the metaphor further, there must also be a common understanding what is meant by “high sunspot activity” or “low sunspot activity”. If some actors classified an intermediate level of sunspot activity as “high” while others classified it as “low”, then sunspots would no longer be able to play their expectation coordination role. In short, there must be transparency about sunspots in order for them to coordinate expectations.

Now enter the central bank. One way of summarizing the modern expectationalist view of central banking is to say central banks have successfully taken over the role of sunspots. If economic actors can be persuaded that it is a central

bank announcement, rather than the level of sunspot activity, that will coordinate expectations about interest rates and prices, and thus determine interest rates and inflation, then here is a free instrument for the central bank that offers a more predictable and smoother way of influencing outcomes than actually intervening in markets. The “efficacy of central banking as sunspots” requires that central bank pronouncements acquire the same features as sunspots outlined above: they must be observed by all, it must be common knowledge that they are observed by all and there must be common knowledge of the exact meaning of the pronouncements. In short, central bank communication must be transparent.

Of course, it is a little more complicated than that. The economists who use the metaphor of sunspots do not believe that it is actual sunspots that serve as equilibrium selection devices, nor that economic actors condition on completely payoff irrelevant events. Rather, they think that economic actors could focus on a piece of news which is only a little bit payoff relevant, and via its role in coordinating expectations, that piece of news could play the role of a sunspot.

Likewise, central bank announcements convey real information that is directly relevant to economic actors. In particular, they can or might convey information about current actions of the central bank, future actions of the central bank and the state of the economy. This information is relevant to economic actors, not just in assessing the variables that are the subject of the announcements, i.e., the bank’s current and future actions and the state of the economy, but also about other variables, e.g., long run interest rates and asset prices. But – in an environment that is subject to self-fulfilling expectations – it could play a role in coordinating expectations about long run interest rates and stock prices that is far greater than could be justified by the information content of the announcement. Indeed, this is simply to repeat the main claim of the modern expectation coordination view of central banking: central banks might be able to coordinate

expectations well even when their actions have only small, lagged and unpredictable effects on outcomes.

This analogy between sunspots and central bank communication policy then begs the question: transparent central bank communication may be successful in coordinating expectations, but under what circumstances will expectations be coordinated on something desirable – as in recent experience – and under what circumstances might they be coordinated on something undesirable? We now turn to this question.

2.1. Can more transparency reduce informational efficiency by crowding out private information?

In Morris and Shin (2002), we considered this question in a stylized model of public communication that we will use to illustrate a number of points in this talk. Consider a large group of economic actors. Suppose that each actor wants to set his action equal to his expectation of an average of (i) the state of the world and (ii) the average action of others. And each actor has some private information about the state of the world as well as hearing a public announcement about the state of the world from the central bank. How accurately should we expect average actions to reflect the information that actors obtain from public and private signals?

Because of peoples' desire to have their actions close to others' actions, they will have an incentive to put more weight on public signals than private signals, even if those signals are equally informative about the true state. If it is socially desirable for actions to reflect the best information available, the strategic motive leads private information to be inefficiently ignored. Now if the precision of public announcements is increased – think of this reflecting increased transparency of the central bank – there will be two countervailing effects. On the one hand,

given any rule by which actors aggregate private and public signals, the increased accuracy of the public signal will improve outcomes. On the other hand, if private information is already being inefficiently ignored, increasing the precision of public announcements will just lead to more inefficient discounting of private information. Which effect prevails? If public announcements are accurate relative to the accuracy of private information, then increased transparency (increased precision of public announcements) is unambiguously good. But if public announcements are relatively inaccurate, then their effect in crowding out private information predominates and increased transparency could be bad.

What lessons might this benchmark observation have for central bank transparency? Notice first the excess reaction of the market to public announcements seems to capture the traditional concern of central bankers that the market may overreact to apparently innocuous statements and that extreme caution in speaking to the public might be a safe response to such overreaction. And in the extreme case when peoples' beliefs about others' actions are especially important, public announcements will have a large impact on outcomes even then they convey very little payoff relevant information. In this sense, they act like sunspots.

A couple of reasons have been suggested for why these observations might have limited relevance for central bank communication in practice.

First, the negative welfare impact relies on the assumption that while economic actors' desire to coordinate with others yields private benefits, it does not yield social benefits. In many micro-founded models, this may not be the case. For example, Christian Hellwig has shown that when the coordination motive represents strategic complementarities in a monopolistic price setting model, the social benefit to coordinated action is sufficiently high to prevent the negative welfare impact.

Second, the negative impact of a marginal increase in the accuracy of public

announcements arises only when public signals are inaccurate relative to private signals. If the central bank is not significantly less informed than the private sector about the subjects on which it communicates, then the welfare impact is unambiguously positive. Lars Svensson has argued forcefully that this is the empirically relevant case. Surely, the central bank is more informed about the central bank's conduct of monetary policy now and in the future. And even in forecasting the economy, there is evidence that, for example, the Fed. performs well relative to the private sector.

These are both important points. But let us argue why we nonetheless think there might be lessons here for central bank communication policy.

First, we think that it matters whether the welfare objective is merely to coordinate expectations on *some* thing or to coordinate expectations on the "*right* thing".

Much analysis of monetary policy focuses on reduced form modeling where heterogeneous expectations are not explicitly modeled and where the loss function is a weighted sum of the output gap and deviation of inflation from its target. Here, coordination of expectations is assumed but the level of expectations matters, i.e., it matters that the expectations (coordinated by assumption) are coordinated at the right level. It is clearly unsatisfactory to have a theory motivated by expectation coordination where coordination is assumed. But the reduced form loss function presumably reflects some intuition that it does matter what you coordinate on. Remember, it is exactly when levels rather than coordination per se matter that the potentially negative effect of increased precision of public announcements arises.

On other hand, many microfounded models – such as the pricing under monopolistic competition model of Christian Hellwig – have the feature that price levels do not matter, only relative prices. In other words, coordination is valuable

but it does not matter what you coordinate on.

To understand the welfare impact of using central bank communication to coordinate private sector expectations, we must take a position on why coordination is required, and what is the tradeoff between coordination per se and coordination at the right level.

Second, if central bank communication is to play such an important and beneficial role in coordinating private sector expectations, it must be because – in the absence of such communication – expectations would not be coordinated, or, in other words, there would be heterogeneous interpretations about what is going on in monetary policy and the economy. Where do these heterogeneous interpretations come from? If you are confident that these heterogeneous viewpoints have no informational value, then no socially valuable information is lost by removing economic actors' conditioning on their different viewpoints. How confident should we be that no socially valuable information is lost? It certainly sounds safe to argue that if the central bank's information is better than all the information among private sector actors, the social loss from transparency cannot arise. And proponents of transparency would argue that this is the case at the relevant margins of the debate on transparency. But even if this rule is accepted, there may not be agreement on whether the central bank has more relevant information. Since future central bank actions are crucial to forming coordinated expectations in the market, many central banks have been saying more and more about future policy plans. Yet Mervyn King (2006) insists that he and Bank of England's Monetary Policy Committee have no more information about future policy actions than the private sector: "We don't say where interest rates will go next for the simple reason that we don't know. And it would be quite misleading to pretend otherwise."

A closely related issue is the revealed preferences of the central bank as em-

bodied in the forecasts it issues on the path of its policy interest rate. Charles Goodhart (2007) notes that when a central bank issues forecasts of inflation and the output gap, together with its forecast of the policy rate, there is an implied weighting over inflation and the output gap that is revealed in the combined forecasts. Such preferences may not be explicitly held or agreed among the members of the monetary policy committee. Nor will such preferences necessarily pass the time consistency test.

Finally, note the important implicit assumption that a central bank has control over the inferences the private sector draw from its communication. Mervyn King may not wish to communicate about the Bank of England's future policy actions, because he believes that he does not have relevant insights over and above his explanation of objectives and current policy. But the market will make inferences about future policy and the MPC minutes might play a role in coordinating expectations about future policy decisions. In doing so, it might crowd out any insights that the private sector might have had that it would have been desirable to have reflected in the coordinated market expectations.

Or consider a more transparent central bank, like those of Norway and New Zealand (and recently Sweden), that does seek to communicate what future policy decisions will be conditional on the future state of the economy. Such announcements may coordinate expectations about future policy but may also be relevant to private sector assessments of future stock prices and might play a role in coordinating expectations about stock prices. Yet it is surely true that the private sector has valuable information about stock prices which we would not like to see crowded out by either sunspots or misunderstood central bank communication.

2.2. Is there a conflict between managing expectations and learning from markets?

Ben Bernanke has argued that “when the monetary policy committee regularly provides information about its objectives, economic outlook, and policy plans, two benefits result. First, with more complete information available, markets will price financial assets more efficiently. Second, the policymakers will usually find that they have achieved a closer alignment between market participants’ expectations about the course of future short term rates and their own views.”

In other words, Bernanke argues that (1) when the central bank conveys its own views more clearly, market prices will be more informationally efficient; but (2) when the central bank conveys its own views more clearly, market expectations may be closer to the central bank’s own expectations.

Prima facie, there seems to be a conflict between these two claims. If the central bank is able to successfully coordinate market expectations, it is because market participants put a significant weight on central bank announcements. This means they must put less weight on their own private information. This would seem to lessen the informational efficiency of market prices. To the extent that the central bank collects information about the economy from the private sector, this suggests that more transparent communication by the central bank might reduce the informativeness of information from the private sector and reduce the central bank’s ability to conduct monetary policy in future. In Morris and Shin (2005), we formally modeled this tension between managing expectations and learning from them, as well as noting anecdotal evidence consistent with this view.

Advocates of transparent central bank communication downplay a conflict here. Bernanke would surely argue that the economic data that serve as inputs into U.S. monetary policy are distinct from the asset prices that reflect the coordinated expectations generated by transparent central bank communication, and

that there is no feedback between the two. This question surely merits further theoretical and empirical investigation.

2.3. The Precision – Commonality Trade-Off

In our discussion so far, we have assumed that if the central bank has some information, it is feasible for the central bank to make that information public. We have noted that the “publicity” or common knowledge of the information enables it to have a large role in coordinating expectations, hopefully in the social interest (but conceivably not).

But as any central banker knows, it is not so easy to communicate information in such a way that it become common knowledge within the private sector. If different listeners interpret an announcement differently, then the content of the announcement does not become common knowledge. If some listeners pay attention to the announcement, while others do not, then the content of the announcement does not become common knowledge. Intuitively, the more one attempts to communicate, the more likely it is that some listeners will not pay attention to all the information, and the less common knowledge. In this sense, there is a trade-off between the commonality of information communicated and the accuracy of that information.

In Morris and Shin (2007), we used the following example in illustrating this trade-off. Consider again the coordination problem that we described earlier: each actor is trying to match his action to some average of his expectation of the state and his expectation of the average action of others. Suppose I know the true state and have two alternative communication scenarios available. Under scenario one, I could collect everyone together into one lecture hall and announce the state. However, this lecture hall would have to be very large and there would a large amount of noise added to my announcement of the state. In other words, while I

would announce the true state, everyone would hear the same noisy signal of what I said. In this case, there would be common knowledge of an inaccurate signal of the state. But under scenario two, I could divide everyone into two equal groups and put them in smaller lecture halls with better acoustics. In each lecture, my announcement of the true state would be heard with less noise. But each audience would have a different noise term. In this case, everyone's information about the state would be more accurate than under scenario one, but there would not be common knowledge of their beliefs. If these were the only communication scenarios available, then there is a non-trivial trade-off between precision and accuracy of communication that will be important even if increased accuracy of public signals is always desirable.

There is a trivial sense in which this trade-off is reflected in the design of central bank communication. Monetary policy committee go to some effort to ensure that there is a single definitive statement of their policy decisions and reasoning. This enhances the commonality of understanding of what they have said. Repeating their position to multiple audiences, offering further clarifications when confusion arises, might unambiguously increase the accuracy of the public's understanding their position. But it would not enhance the commonality of the understanding, since some people might miss the clarification.

This trade-off must surely arise in understanding the limits to transparency. Many central bankers comment that markets may absorb unconditional forecasts of future policy, conditional forecasts are too much for the market to bear. One way of understanding this claim is that there is a greater hurdle in attaining common knowledge than merely conveying information to a single individual. An inflation target or unconditional forecast may be sufficient simple for there to be confidence that "everyone" is observing it, but more complex communication strategies may erode common knowledge and – in this sense – lessen transparency.

3. Current Debates

How can we relate the theoretical ideas outlined above to the current debates surrounding the conduct of monetary policy? We will focus in greater detail on one issue that we have touched upon already - namely, on whether a central bank should publish its own forecast of its policy rate. This question has come right to the fore of the debate following the recent decision of Sweden's central bank, the Riksbank, to join the central banks of Norway and New Zealand in publishing the forecast of its policy rate. Even among those central banks that have explicit inflation-targeting policy regimes, the practice of publishing the forecast of the policy rate puts these three countries (New Zealand, Norway and Sweden) at the vanguard of the trend toward greater central bank disclosure. The Bank of England (another inflation-targeting central bank) has been less willing to go down this route, as already noted earlier in our discussion.

The Bank of England's position is at odds with a body of work both in academia and policy circles that has advocated forward-looking guidance by the central bank on its future actions as a way to enhance the effectiveness of monetary policy. We have already noted the key planks in this argument. The argument starts with the observation that the central bank generally controls directly only the overnight interest rate. The links from the overnight rate - the direct lever of monetary policy - to the prices that matter such as long-term interest rates depend almost entirely upon market expectations, 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 the expectations theory of the yield curve - i.e. that long-term interest rates are determined (or at least influenced in large part)

by market participants' expectation 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 gained a lever of control over long-term rates, monetary policy works through the IS curve - through quantities such as consumption and investment.

Indeed, as we have commented already, the management of expectations is seen by many leading monetary economists of the expectationalist school as *the* task of monetary policy. For Svensson (2004, p.1), "monetary policy is to a large extent the management of expectations", or as Woodford (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 (then Fed Governor) Ben Bernanke (2004a) entitled "The Logic of Monetary Policy". Here, Bernanke explores the analogy between driving a car and steering the economy through monetary policy. The economy is a car and the Federal Open Markets Committee (FOMC) is the driver, and monetary policy actions are akin to taps on the accelerator or the brake in order to stimulate or cool the economy as appropriate given the current state of the economy. Bernanke notes that while this analogy is superficially attractive, the analogy breaks down due to the importance of the 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 of arriving at the forecasts of inflation and output that are based either on the assumption that the policy rate will remain constant going forward, or using the path of the policy rate as revealed in market prices of short term interest rate futures contracts. If the central bank knows that its own forecast diverges from either or both of 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.

3.1. Market as a single agent

There are, however, a number of issues that may give us cause to pause and reconsider the arguments. Begin, first, with the practice of treating the market as a single, coherent agent with beliefs that satisfy the consistency requirements that apply to a rational individual. In referring to movements in market prices, we often employ the shorthand to refer to the "market's expectations". In simple formal models with a representative agent, there is indeed a representative individual whose beliefs correspond to the "market's expectations". In practice, however, there is no such thing as the "market's expectations". The market is not an individual, and market prices do not correspond to the beliefs of a particular individual. Instead, market prices are determined as the result of the interactions of a large number of individuals who may have their own respective windows on the world, and who do their best to infer the information of other individuals in the market.

When traders have differential information, and have short trading horizons, Allen, Morris and Shin (2006) show that the prices that emerge from the forward-

looking rational expectations equilibrium of an otherwise standard asset pricing model exhibits the tell-tale features of the excessive influence of public information over private information. One symptom of the over-reliance on public information is the fact that the (arithmetic) average of the expectations of the traders concerning the fundamental value of an asset two periods from now need not be equal to the average expectation today of the average expectation tomorrow of the fundamental value. In other words, the “law of iterated expectations” fails for the average expectations of the market as a whole. Such a failure would never occur if the market were a single, coherent agent capable of holding beliefs as a single individual.

Once we break free from the straitjacket of construing the market as a single, coherent individual, some of the anomalies that have been raised as potential obstacles to publishing guidance on future policy actions of the central bank appear to be on stronger ground. As mentioned by Rudebusch and Williams (2006, p. 2), one of the strongest central bank taboos is the prohibition against talking publicly about future interest rates. This taboo is attributed to the belief that financial markets would tend to interpret any central bank statements about the likely future path of policy as commitment to future action, as opposed to conditional projections based on existing information and subject to considerable change. Mervyn King’s argument alluded above rests on similar misgivings. To the extent that the “market” is not one single individual with coherent beliefs, such misgivings do not attribute irrationality or bounded rationality to the “market”. There is no such attribution of irrationality, since there is no one individual called the “market” that can be the subject of such attribution. To think otherwise would be to commit what philosophers call a “category mistake”¹

¹The Wikipedia entry on category mistake gives the following definition. “Category mistake, or category error is a semantic or ontological error by which a property is ascribed to a thing that could not possibly have that property.”

3.2. Expectations Theory of the Yield Curve

We have already seen that an important (perhaps the most important) plank in the argument for the desirability of publishing guidance on the future path 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 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 almost 25 years ago, Shiller, Campbell and Schoenholtz (1983) 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 of 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 wall (leaving a cat-shaped hole), or flattened by a steamroller. Yet seconds later he is up again plotting his evil deeds.” [Shiller, Campbell and Schoenholtz

(1983, pp. 174-5)].

Their paper was published in the Brookings Papers of 1983, but the force of their argument remains as strong as ever. The bond market crash of 1994, and the fluctuations in the yield curve in the summer of 2003 are two of the more glaring instances of apparent “overreaction” by the market to central bank communication.

When considering the workings of financial markets and the motivation of traders, the failure of the expectations 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 one or two years out in the yield curve, it seems more of a stretch to believe 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 10 year swaps, could we plausibly believe that they are influenced primarily by their beliefs of central bank policy 7, 8 or 9 years from today? Evidence from the markets tend 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.² The expectations theory of the yield curve seems even less secure in the face of

² Goodhart quotes the following passage from the speech by Deputy governor Berlo. “It is now almost three months since the previous Inflation Report was published. Since that time forward rates have increased and approached Norges Bank’s interest rate path. Forward rates somewhat further out are still lower than our forecast. The reason may be that market participants have a different perception of the interest rate path that is necessary to stabilise inflation at target and to achieve stable developments in output and employment. Alternatively, the market may have the same short-term interest rate expectations as Norges Bank, but because of extraordinary conditions long-term bond prices are being pushed up and, consequently, long-term bond yields are being pushed down.”

such evidence.

3.3. Monetary Policy and Informational Efficiency

To the extent that market prices guide real economic decisions, the informational value of market prices ought to be of interest to central banks. Following the recent cooling of the residential housing market in the U. S., the excesses of the lending practices of some financial institutions to the “sub-prime” mortgage market has become a subject of topical debate and a cause for concern. Many of the sub-prime loans were extended in the period of unusually low short-term interest rates earlier in the decade, illustrating the long-lasting nature of some investment and financing decisions. As such, informational efficiency should be of concern to central bankers. In contrast to monetary models based on the IS curve that emphasizes *flows* (such as consumption flows), many important decisions affected by monetary policy are concerned with *stocks* (such as debt). Stock decisions can sometimes be difficult to reverse.

Irving Fisher in his *Theory of Interest* (Fisher (1930)) gives the example of three possible uses for a plot of land - for forestry, farming or mining. The interest rate used to discount future cash flows largely determines the ranking of the three projects. Long duration projects such as forestry, where the bulk of the payoffs arrive in the distant future, do best in an environment of low interest rates. When interest rates are high, short-duration projects like strip mining dominate. Since investment decisions are often difficult to reverse, distortions to investment can have a lingering effect long after the initial misallocations.

Central bankers have a large impact on financial markets. Indeed, it could be argued that the central bank’s impact can sometimes be *too* large. By the nature of the problem, it is difficult to gauge whether the reactions in the financial market is excessive or justified by the fundamentals. However, behavior of financial

intermediaries as illustrated above show that it cannot be taken for granted that informational efficiency will be guaranteed. Apparent “overreactions” will be the rule rather than the exception.

4. Conclusion

In the middle of the twentieth century, there was an earlier attempt to use transparent communication to coordinate private sector expectations to socially efficient outcomes. It was called “indicative planning”. The idea was that missing markets might lead to market failures: in five years time, if the manufacturing sector made the right investments, there would be an increased demand for steel; if the new steel plants had been built, there would be supply to meet the demand. But the lack of a future steel market meant that the invisible hand would not equate them in an efficient way. But if the planning agency could collect information from the managers of the manufacturing sector and the steel sector, and publicly and transparently announce this information, then they might be able to coordinate market expectations to a socially efficient level. A recent book by Barry Eichengreen (2006) gives an overview of the process and the outcomes.

In the event, the plans did not always work as intended. Coordination was evidently more difficult to achieve than this. Some of the problems of indicative planning are orthogonal to the new view of monetary policy (e.g., the relevant private sector entities would be large actors who would have an incentive to misreport their private information). Others might be more relevant (would an “independent” planning agency insulated from short term political considerations have performed better?) One of the lessons from the global games literature is that when the costs of miscoordination are large, the inherent strategic uncertainty about others’ actions entails some degree of inefficiency in the outcome.

The public policy instrument of “coordinating expectations” through trans-

parent communication has not always been a success. Yet it seems to be working well for monetary policy in a number of countries in recent years. This raises an interesting question. What is so special about monetary policy that allows coordination failure to be fixed with such apparent ease? One important factor is surely that while successful communication can reduce the importance of the central bank's direct instruments, such as controlling overnight interest rates, those instruments are still there and "off the equilibrium path" – i.e., if the communication policy failed to coordinate expectations – they would be used and could have a large if less predictable impact than the first best option of using communication alone.

If coordination of expectations is possible, then it is a powerful force for good, as illustrated by the successes from increased transparency of central bank communication in the last fifteen years. But this powerful could – in some circumstances – be damaging. In this talk, we have tried to describe how taking expectations coordination seriously suggests when it could be damaging. In doing so, it offers some insights into what the limits to transparency should be.

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