Commentary: Communication and the Beliefs of Economic Agents

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Expectations are crucial for the behavior of firms, consumers, banks, etc. The predictions that standard macroeconomic models make about policy, as well as their structural interpretations of the data, depend heavily on the assumptions that agents are fully rational, have access to all relevant information, and can readily process that information. These are convenient but gross abstractions. There have been many attempts, both old and new, to push the theory beyond this benchmark.[1] But until recently, progress had been limited by the lack of sufficiently long or rich data on expectations. The authors of this paper, along with their collaborators, are leaders in a recent and growing empirical literature that has shed new light on how macroeconomic expectations are formed in the real world and how they adjust to shocks or policy shifts.

This paper draws from both earlier and new evidence to offer guidance about **(i) what central banks should talk about and (ii) how they should do it.** The authors focus especially on the question of how the communication of information and/or policy commitments about inflation affects consumer spending and expectations of income, or expectations of "where the economy is going." And they frame their exercise in the context of the related question of whether people interpret news about inflation as movements along a Philips curve.

The paper contains rich evidence on these issues. I will not go into the details. Instead, for the purposes of this discussion, I will summarize the key findings as follows:

> **Fact 1. For professional forecasters, news of higher inflation tends to be "good news:"** high expected inflation correlates with high expected income and growth and low expected unemployment. In this sense, it is as if Professional Forecasters operate with a Phillips curve in their mind and assume that business-cycle variation in inflation and growth is driven primarily by inflationary demand shocks.
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> **Fact 2. For consumers and firms, news of higher inflation tends to be "bad news."** Consumers who expect higher infwlation spend less, and consumers and firms both associate inflation with lower income in survey expectations. Continuing the previous analogy, it is as if consumers and firms assume that variation in inflation and growth is driven primarily by disinflationary supply shocks, or there is an "inverted Phillips curve."

These facts raise the following three important questions:

> **Q1.** What are the lessons for policy?
>
> **Q2.** Whose perspective is actually right? That of the professionals or that of the laymen?
>
> **Q3.** What do the facts mean for theory?

In the remainder of my discussion, I offer some answers to these questions by synthesizing the evidence in this paper with a recent theoretical literature that seeks to accommodate a certain friction in how agents reason about general-equilibrium effects, and with my own views about how the economy works.

Regarding the first question, the conclusion that the authors draw from Fact 2, and from additional related evidence presented in the paper, is that **the communication of news and/or a policy commitment about higher inflation could backfire by suggesting "bad news" about the state of the economy** to consumers and firms, who may ultimately be the most important group for central bankers to reach.

I agree with this conclusion, although I would draw a line between news about inflation that contains information about underlying economic shocks and news that represents policy commitments. Ideally, we would like to have reliable instruments for different kinds of policy commitments. Instead, the evidence in this paper speaks more about the inferences people are making about the state of the economy and/or their own circumstances. I will come back to this issue momentarily, but let me first consider the other two questions raised above.

Consider the second question: **Who is right? The professionals or the laymen?**

If we draw a scatterplot of the combinations of inflation and unemployment over the last 30 or 60 years, we will see a cloud of "noise," with no obvious systematic relation between inflation and real economic activity. This what is often referred to as the disappearance of the Philips curve in the data. And if we try to understand what news about inflation objectively mean with the help of a VAR, we may well find that positive innovations in inflation tend to predict an increase in unemployment (and a reduction in GDP, hours worked, investment and consumption). This is, for instance, the pattern my co-authors and I observe when we recover from the data the shock that accounts for the maximal share of the variation in inflation at business cycle frequencies (Angeletos, Collard and Dellas 2020).

From this perspective, it seems that the consumers' interpretation of inflation news is closer to the truth. Maybe professional forecasters think "too much" in terms of a Philips curve. But it is not clear why the consumers get it right. Are they smarter? Or just lucky, getting it right for the wrong reason?

This brings me to the last question raised above: **What do the facts mean for macroeconomic theory?**

It easy to reconcile each one of the two facts—and each one of the two ways of interpreting news about inflation—with the textbook, Keynesian paradigm. All we have to do is to vary the relative importance of demand and supply shocks. But to make sense of both facts simultaneously, we have to depart from the standard model in the

following direction: we must allow different agents to hold different opinions about how the economy works or otherwise make different inferences from the same data and the same policy news.

A minimal such departure would be to let different agents agree that the correct model of the economy is the Keynesian one, but disagree on the relative importance of demand and supply shocks: both the professional forecasters and consumers "believe" in the Philips curve, but the latter attribute a smaller importance to demand shocks moving the economy along the Philips curve than to supply shocks shifting that curve up and down.

Although the available evidence does not allow one to test this explanation, I doubt it is the right one. Unlike professional forecasters, most consumers have no idea what a Philips curve is, and—for better or worse—have not been taught macroeconomics. When trying to understand what higher inflation means, they probably draw primarily from their own personal experiences, and only secondarily from the public media. In this context, I would expect regular people not to engage in the kind of sophisticated, general-equilibrium reasoning that underlies our structural interpretations of the data and our policy evaluations (where by "our" I mean those of economists). Instead, I would expect consumers to hear merely the following: "the prices of the goods you buy are going up." The authors indeed discuss evidence suggestive of this hypothesis.

What does the above mean in terms of our models? In my eyes, it means that we have to rethink how general equilibrium works. In standard models, agents have infinite depth of knowledge and rationality. This amounts to assuming that, at least on average, they can not only effortlessly rack the available data but also accurately predict the general-equilibrium implications of shocks or policy changes. But if this is not true, if consumers are inattentive or plainly wrong, then our predictions and policy prescriptions could themselves be wrong.

To illustrate, and to go back to the first question, **consider how a commitment to higher inflation affects aggregate demand when the economy is in a liquidity trap.** The answer provided by the textbook New Keynesian model is familiar: when the zero lower

bound (ZLB) is binding, a commitment to higher inflation stimulates aggregate demand and, thereby, raises aggregate employment and income. But let me revisit the mechanics of how the model arrives at this prediction and let me explain how this relates to the aforementioned discussion about partial-equilibrium (PE) and general-equilibrium (GE) effects.

To ease the exposition,[2] let me abstract from dynamics and let me express aggregate consumption as follows:

$$C = -a \cdot r + b \cdot EY \tag{1}$$

where r is the real interest rate, Y is real aggregate income, EY is the consumers' expectation thereof, and (a,b) are positive scalar parameterizing the sensitivity of aggregate consumption to, respectively, interest rates and income. Next, let me write the real interest rate as follows:

$$r = R - E\pi \tag{2}$$

where R is the nominal interest rate and π is inflation. Finally, let me peg R at zero (because of the ZLB). Let me write the Philips curve as

$$\pi = \kappa Y. \tag{3}$$

where κ is a positive scalar parameterizing how much inflation moves with aggregate demand (or the output gap).

In the standard model, consumers understand all of the above equations. This implies that, if the monetary authority announces credibly a commitment to a higher π, the consumers will use equations (2) and (3) to translate the news about higher inflation to news about both lower interest rates and higher income. This is a doubly good news, which ought to stimulate aggregate consumption.

But now suppose that consumers do not filter the news about higher inflation through equations (2) and (3). Then, the consumers may not only fail to map a higher π to a lower r and a higher Y., and they may therefore fail to increase their spending. To make things worse, suppose that the consumers have in mind a different, more basic equation, about which they have personal, everyday experience: that real income, Y, is given by the ratio of nominal income to the price level. Then, if they don't expect nominal income will go up more

than the price level (as the New Keynesian model predicts because of all the GE channels), they will map a higher π to lower Y and they will choose to spend *less*.

To sum up: **It is seems plausible that, in reality, consumers don't understand the GE working of our models and interpret a commitment for a higher inflation in the "wrong" way** (i.e., in the opposite way from that dictated by the model). And when this is true, the model's policy prescription is itself wrong, *even if* the Philips curve and the associated Keynesian thinking are correct.

What is more, if all consumers interpret a commitment to high π as "bad news" in the sense described above, the news becomes truly bad in the sense that Y actually goes down as consumers spend less. Hence, the consumers may ultimately be right to think of inflation as bad news, albeit for the wrong reason.

Let me add one more point about how people think about inflation, or whether they think at all about it. **In the modern, post-1980s era, inflation is simply not a salient, everyday concern for most people—indeed thanks to modern, stabilizing policies by central banks.** But once inflation becomes "noise," it is reasonable (and indeed consistent with rational inattention a la Sims 2003) that people pay little attention to inflation and that their behavior may be insensitive to news about it, unless they are pressed hard to think about it (either by policymakers or the designers of surveys/experiments). And when they do think about it, they may well do so in the "simplistic" PE terms described above.

Perhaps central bankers and economists could also do well to think more along these lines, both in terms of better understanding what the public thinks *and* making the most accurate forecasts themselves about policy. To put it more in the language of models, inflation is neither a reliable indicator of output gaps and aggregate demand in modern business cycles. This is either because the Phillips curve has become extremely flat, or because our models are more fundamentally wrongly specified. And on top of that, inflation is not a reliable means for stimulating the economy.

To be clear, neither of these statements negates the power of monetary policy or the importance of aggregate demand shocks. Recent research by myself with collaborators[3] and by others[4] has tried to formally sketch how demand-centric theories have "life beyond the Phillips curve," with some success in matching the data. But the facts and the discussion above significantly question the usefulness of the Phillips curve for *understanding modern business cycle* and for *designing policy communication*. More crucially, policymakers' goal in (re-) designing communication frameworks ought to be robust to details of how experts *should* model the economy and how the general public *actually does*.

The Upshot: Talk Clearly About u and Y, not Obtusely About π. My own take-home lesson, based on the combination of the empirical evidence in this paper, additional evidence on the effects of forward guidance, and recent theoretical advances, is the following.

First, what should the Central Bank talk about? A number of analyses have used a variant of my discussion above regarding misestimation of GE effects to argue why forward guidance about interest rates may not have not been particularly effective during the Great Recession.[5] More succinctly, describing the interest rate path may not work because the public does not fully understand "why it should." The same basic logic, as discussed above, suggest that a commitment to high inflation doesn't work either. The right strategy may instead be to focus on the things that people *do* routinely think and care about: jobs or income, rather than inflation or nominal interest rates. Some of my own work (Angeletos and Sastry 2020) formalizes this second point.

Second, how should they do it? Simply, crisply, and *constructively imprecisely*. Such communication may resemble Mario Draghi's famous comment from July 2012:

> "Within our mandate, the ECB is ready to do whatever it takes to preserve the Euro. And believe me, it will be enough."

This is both clear about the goal and unclear about how it may be achieved. Contrast this with the very detailed, cautious, and holistic approaches typified by the FOMC's statement in December 2012:

> "[T]he Committee decided to keep the target range for the federal funds rate at 0 to 1/4 percent and currently anticipates that this exceptionally low range for the federal funds rate will be appropriate at least as long as the unemployment rate remains above 6-1/2 percent, inflation between one and two years ahead is projected to be no more than a half percentage point above the Committee's 2 percent longer-run goal, and longer-term inflation expectations continue to be well anchored."

This qualifies the policy targets with various contingencies, which may be understandable to economists and financial market participants, but maybe counterproductively confusing to the consumers and firms.

Let me conclude with an obvious qualification. The optimal communication strategy ought to depend on (i) the intended audience and (ii) the underlying circumstances. Central, for instance, during normal times, it makes a lot of sense to be talking about interest rates to bond markets and financial institution. But in times of crisis, it may be essential to both widen the audience and to change the topic, because in such times the presence of strong GE feedbacks make it even more crucial to influence how firms and consumers think about jobs.

Endnotes

[1]Among these attempts, the most relevant for the purposes of the paper and my discussion are Sims (2003), Mankiw and Reis (2002), Woodford (2003), Mackowiac and Wiederholt (2009) and the works cited in endnote 2.

[2]For a more careful treatment of related ideas, see Angeletos and Lian (2018), Garcia-Schmidt and Woodford (2019), Farhi and Werning (2019), Gabaix (2020) and especially Angeletos and Sastry (2020).

[3]Angeletos, Collard and Dellas (2018, 2020), Angeletos and La'O (2010, 2013), Angeletos and Lian (2019).

[4]E.g., Bai, Ríos-Rull, and Storesletten (2017); Beaudry and Portier (2014, 2018); Benhabib, Wang and Wen (2015); Eusepi and Preston (2015); Huo and Rios-Rull (2020); Jaimovich and Rebelo (2009); and Ilut and Saijo (2018). Related is also the earlier literature on coordination failures (Diamond 1982, Benhabib and Farmer 1994, Guesnerie and Woodford 1993).

[5]See the references in endnote 2. See also Iovino and Sergeyev (2019) for an application to QE.

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