



**CENTRAL BANK OF CYPRUS**  
**EUROSYSTEM**

# **Inflation Expectations, Uncertainty, the Phillips Curve and Monetary Policy**

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Discussion: Athanasios Orphanides

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## Outline of paper

- A view of the history of the Phillips curve stressing the role of inflation expectations
- A discussion of the usefulness of the Phillips curve concept (with a focus on the “new” Keynesian Phillips curve) for thinking about price determination
- Inflation determination without a Phillips curve
- Departing from rational expectations and the implications of new ideas for monetary policy

# The Phillips Curve: Why the Emphasis on Inflation Expectations?

- The Phillips curve has been at the core of thinking about macroeconomic stabilization.
- Two central elements for understanding inflation in the Phillips curve framework: economic slack (the output gap) and inflation expectations.
- Both elements are unobservable and are potentially problematic—subject to misunderstanding and misuse.
- Regarding the output gap, ignorance about its proper definition and measurement in real time leaves little if any room for it to be useful for policy.
- This leaves inflation expectations at the center of policy considerations.

## Inflation Expectations

- Inflation expectations are a crucial determinant of actual price and wage setting and therefore actual inflation over time.
- Well-anchored inflation expectations are essential not only for securing price stability but also for facilitating overall economic stability over time.
- When private inflation expectations become unmoored from the central bank's objectives—episodes characterized as “inflation scares”—macroeconomic stabilization can suffer.
- With unanchored expectations, the Phillips curve becomes too unpredictable to be a useful concept for policy guidance.

# The Importance of Well-Anchored Inflation Expectations

- Well-anchored inflation expectations are arguably most important during times that may be most challenging for monetary policy.
- Monetary policy can have considerably greater leeway in responding to an adverse supply shock (such as we are presently experiencing) when inflation expectations are well anchored.
- The central bank can also have greater flexibility for swift responses to financial disturbances if it can be confident that inflation expectations will remain well-anchored.

## Importance Under Present Circumstances

ECB Governing Council:

“Against this background, it is imperative to secure that medium to longer-term inflation expectations remain firmly anchored in line with price stability.” (Jean-Claude Trichet: Introductory Statement, June 5, 2008)

Federal Reserve FOMC:

“The Federal Open Market Committee will strongly resist an erosion of longer-term inflation expectations, as an unanchoring of those expectations would be destabilizing for growth as well as for inflation” (Ben Bernanke: Remarks earlier at this conference, June 9, 2008)

## Inflation Expectations in the Phillips Curve

- Despite their central role in the Phillips curve and the emphasis policy practitioners place on them, most Phillips curve models rely on rather simplistic and unrealistic models of inflation expectations.
- In early days of Phillips curve modelling, linear fixed distributed lag models were used.
- Later on, rational expectations under perfect knowledge of the structure of the economy were used.

## Inflation Expectations in the Phillips Curve: II

- At present, by and large, the traditional modelling still imposes rational expectation in a world with fixed and perfectly known structure, including known and stable policy preferences.
- Under such assumptions, (either the old-fashioned distributed lag models or the linear rational expectations models that followed them) the monetary policy problem is rather trivial and anchoring inflation expectations a simple matter of policy adopting and adhering to a stable policy rule.

## Implications: “new” and “old” Phillips curve models

- With the expectation formation assumptions just described, by downplaying the information limitations that either policymakers or economic agents likely face in reality and oversimplifying the expectations formation mechanism, both “old” and “new” Phillips curve models have some common issues.
- They may suggest that a Phillips curve model should be able to forecast inflation better than is likely achievable in practice.
- They may suggest the existence of an **exploitable** short-run tradeoff between price stability and economic stability.
- One might be concerned that, if misused, these models could lead both forecasters and policymakers astray.

## Learning and Alternative Models of Expectations Formation

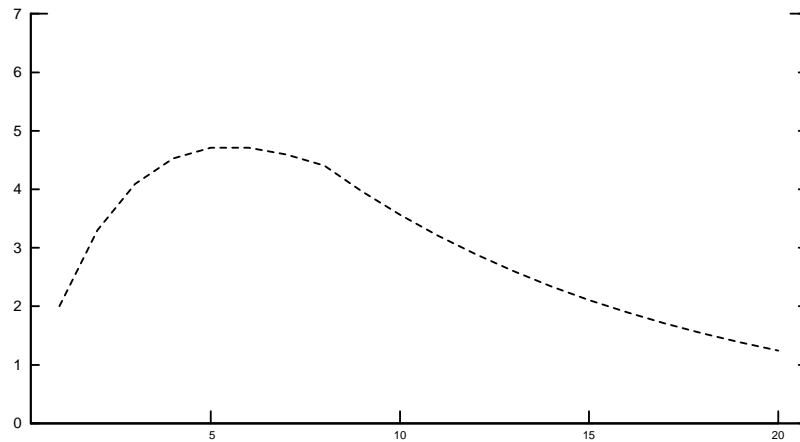
- Recent work has explored various avenues for improving the expectations formation mechanisms embedded in Phillips curve models making them more useful for policy analysis.
- A common element in these models is the acknowledgement of the presence of “imperfections” in the formation of expectations (relative to simplistic rational expectations models)
- These models can better capture the inherent limitations in gathering and processing information.
- One way of proceeding has been to posit that private agents may act as econometricians, respecifying and reestimating forecasting models as they attempt to cope with concerns of structural change and uncertainty.

## A Simple Example: The Economy Following a Supply Shock

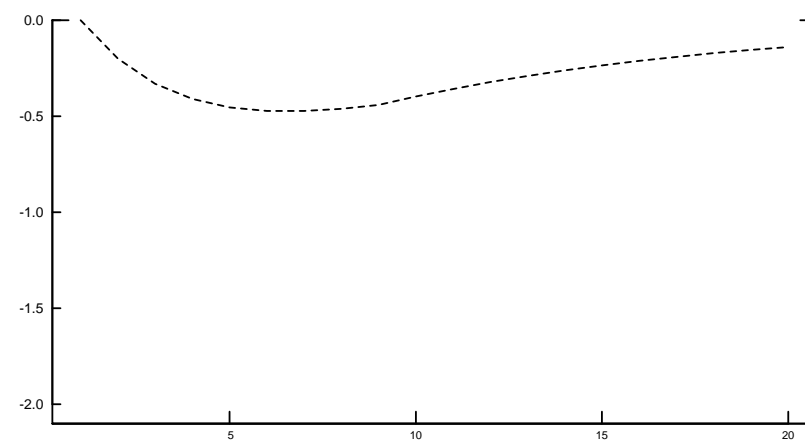
- To illustrate the implications of alternative treatments of expectations, compare the performance of two economies, with an identical Phillips curve and monetary policy rule.
- One treatment assumes that expectations are always well-anchored—the perfect knowledge rational expectations outcome. In the alternative, agents learn from recent economic outcomes in forming expectations.
- One way to interpret the experiment is to assess whether second-round effects from an adverse supply shock can be avoided.
- If so, the effect of supply shocks can be limited.
- If not, the economy may get through an experience that could bring back memories of stagflation.

# A Supply Shock with Well-Anchored Inflation Expectations

Path for Inflation



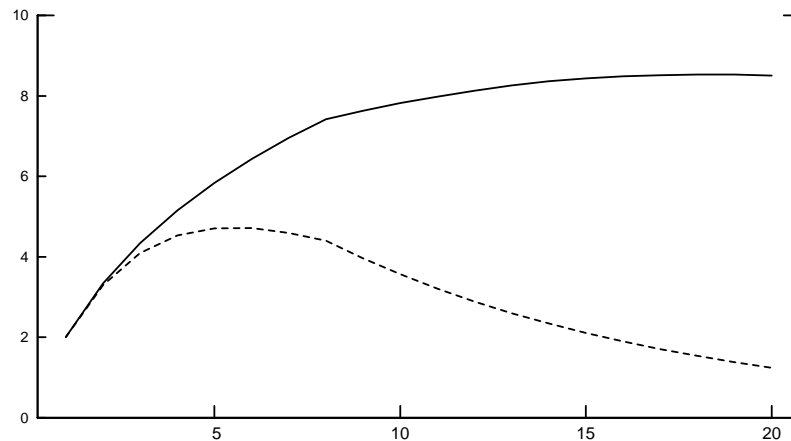
Path for Output



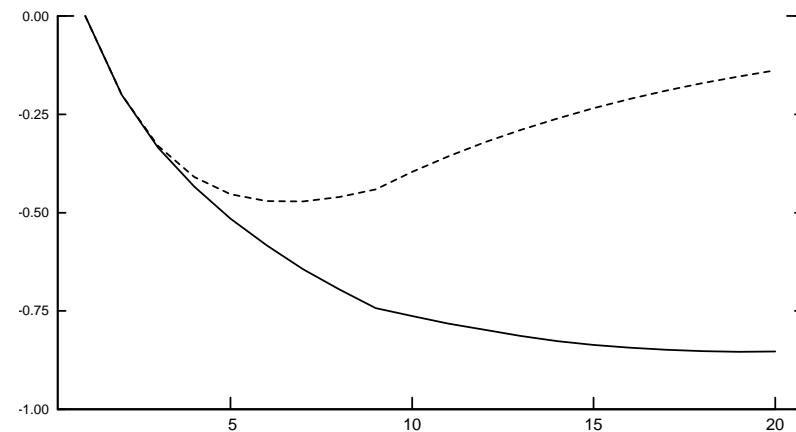
- With well-anchored expectations, the adverse consequences of a supply shock are limited to a temporary hump in inflation and a mild slowdown.

# A Supply Shock with Unanchored Inflation Expectations

Path for Inflation



Path for Output



- Under the same policy strategy but with learning as a mechanism for expectations formation, second-round effects to inflation follow the original supply disturbance which, if unchecked, lead to a protracted stagflationary episode.

Note: Reproduced from Orphanides and Williams (2005), "Imperfect Knowledge, Inflation Expectations and Monetary Policy."

## Implications for Inflation Dynamics

- Learning behavior in the formation of expectations introduces a rich layer of non-linear dynamics in otherwise linear economies.
- It induces time-variation in the formation of expectations and thereby in the structure of the economy even absent fundamental regime changes.
- This complicates empirical modelling (including estimation and forecasting) of fixed-coefficient linear models.

## Implications for Policy

- Learning behavior in the formation of expectations may impart additional persistence to inflation (for a given monetary policy) thereby diminishing policymakers' ability to stabilize business cycle fluctuations in addition to maintaining price stability.
- It provides an explanation why the appearance of an exploitable policy tradeoff in an estimated linear rational expectations Phillips curve model is unlikely to be useful in practice.
- Perpetual learning with imperfect knowledge induces endogenous inflation scares that can be particularly damaging to the economy without forceful policy response.
- This provides an explanation why policymakers monitor inflation expectations so closely and place a premium on maintaining well-anchored inflation expectations.

## Implications for Policy Communications

- Recognition of the role of learning in the formation of expectations introduces a role for central bank communications that is absent in traditional models.
- To the extent central bank communications can facilitate the formation of more accurate inflation expectations, it can prove useful for improving policy outcomes.
- In this light, clarity regarding the central bank's price stability objective may improve macroeconomic performance.

## Summary Remarks

- Proper accounting of the formation of inflation expectations is essential for understanding the potential usefulness and inherent limitations of Phillips curve models.
- Old-fashioned fixed coefficient distributed lag models and simplistic linear rational expectations models of the Phillips curve share some common weaknesses.
- New approaches that incorporate learning may better capture the formation of inflation expectations.
- Clarity regarding the central bank's price stability objective may facilitate efforts to maintain inflation expectations well-behaved, even in the presence of a series of adverse shocks.
- Ultimately, maintaining well-anchored inflation expectations over time enhances the central bank's ability to flexibly respond to financial disturbances as well as adverse supply shocks.