

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

Christopher A. Sims
Princeton University
sims@princeton.edu

June 10, 2008

A view of the history of the Phillips curve

The New Keynesian Phillips curve: Is it a Phillips curve? Is it useful?

Inflation-determination without a Phillips curve

Departing from rational expectations: new ideas about modeling the effects of uncertainty and inertia

1950's Keynesian theory and inflation

- ▶ The original Keynesian theory took nominal wages as exogenously given — not necessarily constant, but unresponsive to the rest of the economy.
- ▶ It was a theory of an economy operating below “capacity” .
- ▶ Its prediction was that inflation would occur if aggregate demand was pushed above capacity.

The advent of quantitative policy modeling

- ▶ The old Keynesian theory of inflation was discontinuous, and non-quantitative.
- ▶ In the 60's, as economists began to put together quantitative, multi-equation models, this was an inconvenience.
- ▶ Phillips, and the Samuelson-Solow paper applying his ideas to the US, filled this gap.
- ▶ It preserved the idea that inflation occurred when aggregate demand was pushed above capacity, but it made the relationship continuous and quantitative, which was exactly what quantitative modelers needed.

Lucas and Rapping

- ▶ At the end of the 60's Lucas and Rapping gave us a model in which the Phillips curve existed as a statistical relation, but would lead to bad policy if incorporated into a policy model in the way the econometric policy models were using it.
- ▶ This model emerged just as the US entered a period of simultaneous high inflation and high unemployment, so the data on unemployment and inflation jumped off the historical Phillips curve.
- ▶ The model and its later variants quickly took over as the main academic model of inflation determination.

Where this left policy modelers

- ▶ The “Lucas supply curve” — the Phillips curve with surprises in inflation on the right and unemployment on the left — did not work very well quantitatively.
- ▶ While at the beginning some, like Tom Sargent, held out the hope that rational expectations theory and its “cross-equation restrictions” would lead to better quantitative policy models.
- ▶ But the main impact of the Lucas critique was to eliminate interest in multi-equation quantitative macro models in academic research.
- ▶ Policy modelers were left to proceed on their own. They went through their models and made expectation terms “rational”, in the process dropping all formal multi-equation statistical inference.

The New Keynesian Phillips curve

- ▶ Modelers put inflation expectations into the Phillips curve, but there was no clear theory of how this could be founded in a model of individual behavior.
- ▶ Into this gap came Dixit, Stiglitz, Blanchard, Kiyotaki, Taylor, Fischer, and Calvo, and the New Keynesian Phillips curve.
- ▶ It produced a model with agents who had no money illusion and were dynamically optimizing, yet implied a relation between a measure of “real tightness” and inflation that seemed intuitively much like a Phillips curve.
- ▶ What was new was the appearance of expectations in the model explicitly, and the shift from unemployment to the “output gap” as a measure of real tightness.
- ▶ Recently, the literature has focused on the fact that output gaps matter in this theory because they are an index of marginal cost, and has turned to more direct measures of marginal cost, like labor share.

Outline

A view of the history of the Phillips curve

The New Keynesian Phillips curve: Is it a Phillips curve? Is it useful?

Inflation-determination without a Phillips curve

Departing from rational expectations: new ideas about modeling the effects of uncertainty and inertia

Problems with the NK Phillips curve

- ▶ It moves non-neutrality into a “technology constraint” that is obviously not stable under shifts in monetary policy.
- ▶ As a piece of simple, two-dimensional mental furniture, a framework for thinking about the relations between monetary policy and inflation, it does not work well.

Looking at the relation of labor share to inflation in a SVAR

	FF	y	oph	w	p	m	pcrm
policy	X	0	0	0	0	X	X
pcrm	X	X	X	X	X	X	X
y	0	X	X	X	X	X	0
oph	0	0	X	X	X	X	0
w	0	0	0	X	X	X	0
p	0	0	0	0	X	X	0
m	0	0	0	0	0	X	0

Pre-79:3 Responses to M Policy

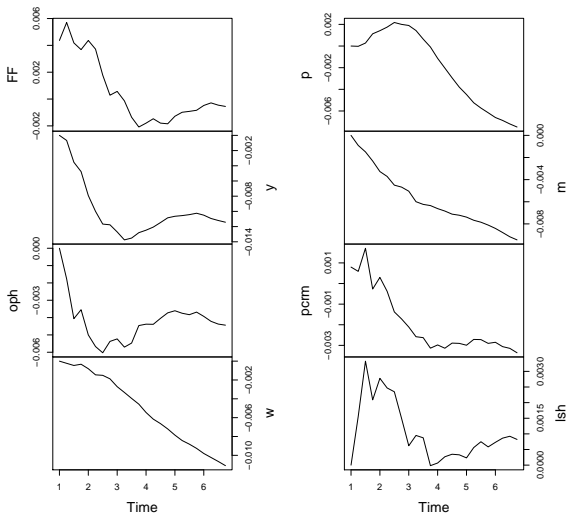


Figure:

Post-83 Responses to M Policy

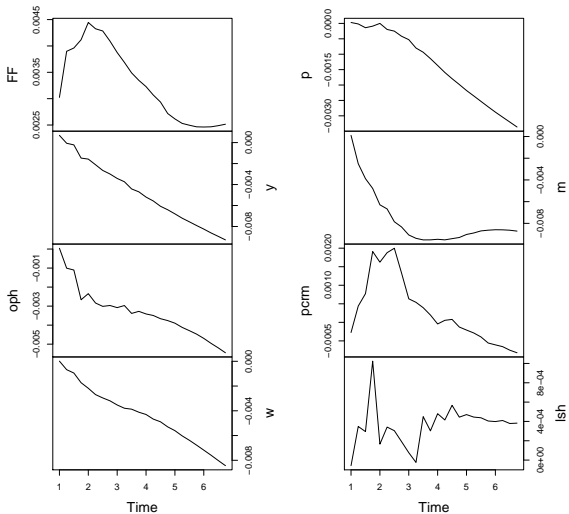


Figure:

Pre-79:3 Responses of p

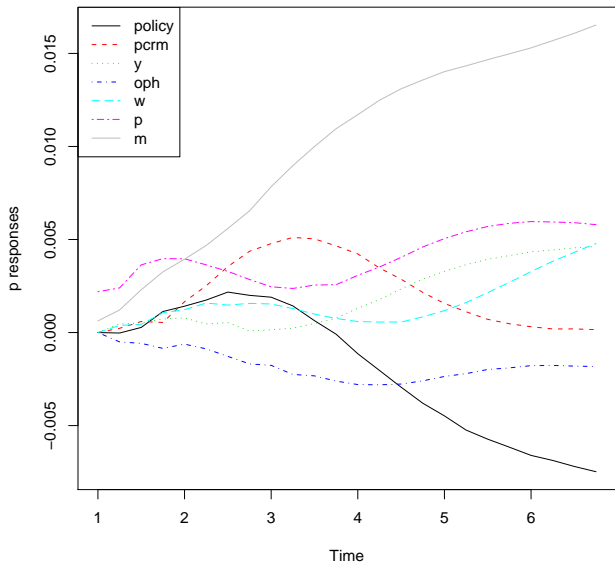


Figure:



Post-83 Responses of p

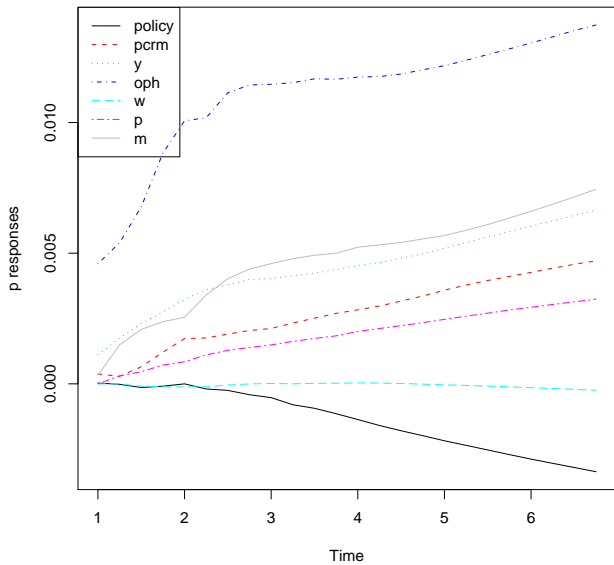


Figure:



Outline

A view of the history of the Phillips curve

The New Keynesian Phillips curve: Is it a Phillips curve? Is it useful?

Inflation-determination without a Phillips curve

Departing from rational expectations: new ideas about modeling the effects of uncertainty and inertia

If not the Phillips curve, what else?

- ▶ This is not a question about whether the Phillips curve should be dropped from equilibrium models.
- ▶ It is about mental furniture — the toolkit of bivariate relationships we pull up in informal thinking about monetary policy and inflation.
- ▶ I have two suggestions, both of which are tentative at this point.
- ▶ A) Focus more attention on the relation of monetary policy and inflation to asset markets.
- ▶ B) Pursue some of the recent new ideas about how to deviate from what Sargent calls the “communist” rational expectations assumption — there is one probability distribution, shared by nature and by all the agents in the model.

The price level as the value of government paper

- ▶ Rises in interest rates make government paper more attractive if people see them as suggesting a persistent increase in the relative return on government paper.
- ▶ This makes people try to shift holdings away from real assets and goods toward government paper, thereby reducing demand and pressure on prices.

Where expectations of fiscal policy matter

- ▶ In order for high interest rates to imply persistent increases in the return on government paper, they must imply higher future primary surpluses.
- ▶ In countries where political economy or bureaucratic inefficiency constrain future primary surpluses, rises in interest rates do not imply higher returns on government debt — they imply only a higher future rate of issue of government paper.
- ▶ Most economists think this possibility applies perhaps, in some periods, to Brazil or similar high-interest-rate, high-inflation economies.
- ▶ I think we should reconsider whether unstable expectations about future fiscal policy might have been important in the inflation process of the 1970's in the US, and perhaps again today.

Fiscal policy in the 1970's

- ▶ In 1975, validating Nixon's pronouncement that "we're all Keynesians now", the Ford tax cut created the largest ratio of primary deficit to outstanding debt ever seen since 1950, unsurpassed even to the present day.
- ▶ Any government that can issue debt, must run primary surpluses (conventional surplus plus interest expense) on average over the years.
- ▶ In eight of the 12 years before 1975, the US ran primary surpluses.
- ▶ In all but two of the 20 years between 1975 and 1994, the US ran primary deficits.
- ▶ Then from 1995 through 2002, there were large primary surpluses, to the point that people began to think that the US debt might disappear.
- ▶ Did bond buyers in 1975 foresee the surpluses of 1995-2002?

Outline

A view of the history of the Phillips curve

The New Keynesian Phillips curve: Is it a Phillips curve? Is it useful?

Inflation-determination without a Phillips curve

Departing from rational expectations: new ideas about modeling the effects of uncertainty and inertia

Two interesting directions

- ▶ Agents with differing beliefs
- ▶ Rational inattention: Agents with limited information processing capacity
- ▶ They interact: Rational inattention, modeled using Shannon's measure of information processing capacity as a constraint on people's behavior, implies that people will act as if they observe market signals with error.
- ▶ This will lead people in different parts of the economy, with different decision problems, to make precise observations of different parts of the state of the economy.
- ▶ This can explain how different beliefs can emerge, and how they can persist, despite the accumulation of freely observable data.

Implications of Shannon theory rational inattention

- ▶ Maybe the notion of a single “expected inflation” is a will 'o the wisp.
- ▶ Survey data shows great dispersion of individual inflation expectations. This may not reflect dispersion in IQ, but rather dispersion in attention.
- ▶ In periods of stable inflation, people will pay less attention to tracking it. This will increase econometric estimates of price stickiness and monetary non-neutrality. This leads to a Lucas-critique-like caveat to the use of models fit to stable periods in deriving optimal policy.
- ▶ Sluggish behavior represents, at least in part, efficient deployment of a valuable resource (attention). This could lead to a different approach to welfare evaluation of monetary policy.

Monetary policy and asset markets

- ▶ Agents with differing beliefs, interacting in asset markets, will make transactions that amount to bets, with optimists borrowing from pessimists to go long and leveraged in the investments that they believe will have high payoff.
- ▶ If the optimists turn out to be mistaken, at the point where they discover this there will be high transactions volume, shifts in wealth from optimists to pessimists, and crashes in asset prices.
- ▶ This all looks like phenomena we have recently observed in asset markets.
- ▶ With rational inattention, this kind of dynamic can evolve over a long time scale.
- ▶ When one of the types of assets involved is government-issued paper, this kind of dynamic can have implications for inflation determination.