

Uncertainty and Nonlinearities: Policy Challenges and New Perspectives

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Uncertainty and Nonlinearities: Policy implications

- ▶ The convenience of linear models with known parameters.
- ▶ The convenience of additive Gaussian shocks (with known VCV).
- ▶ What if the convenient assumptions are wrong?
- ▶ Stress testing models for robust policy advice.

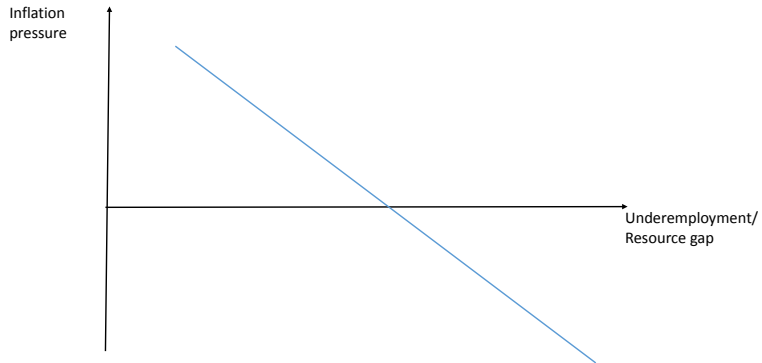


Two examples

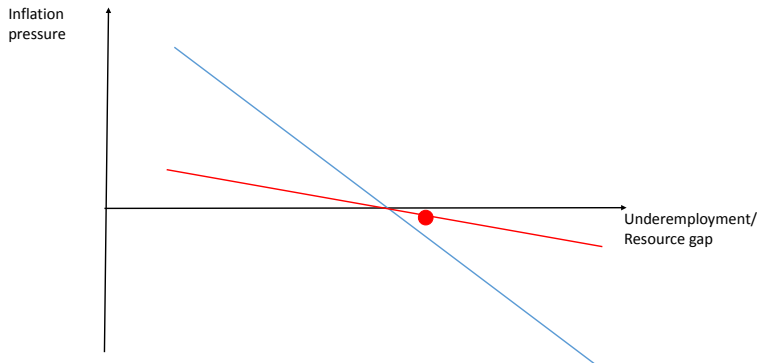
- ▶ A Phillips curve with questionable slope.
- ▶ Risk scenarios.



The Phillips curve



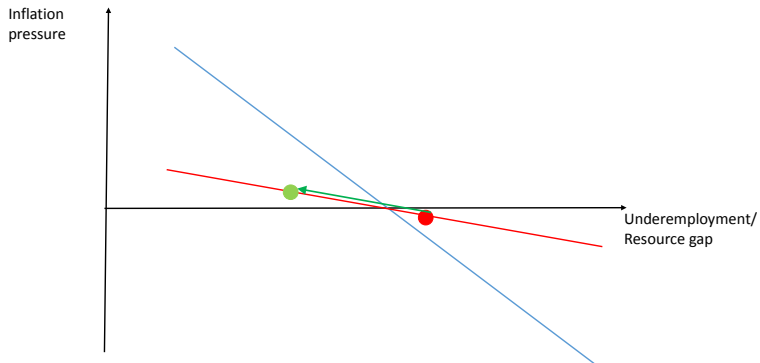
A flat Phillips curve



Risks of undershooting unemployment appear low when Phillips curve is perceived to be flat.



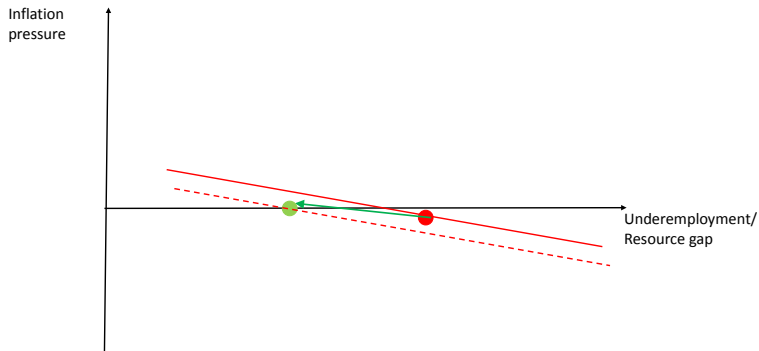
A flat Phillips curve



At worst, aiming to reduce unemployment further will only result in a slight increase in inflation.



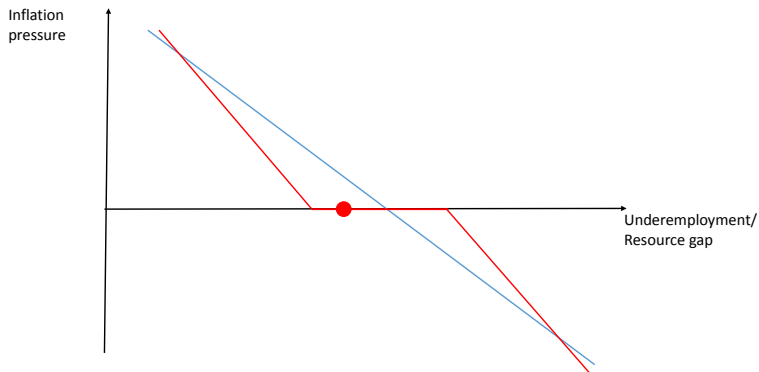
A flat Phillips curve



At best, perhaps it will be learned that the natural rate is even lower than currently believed to be.



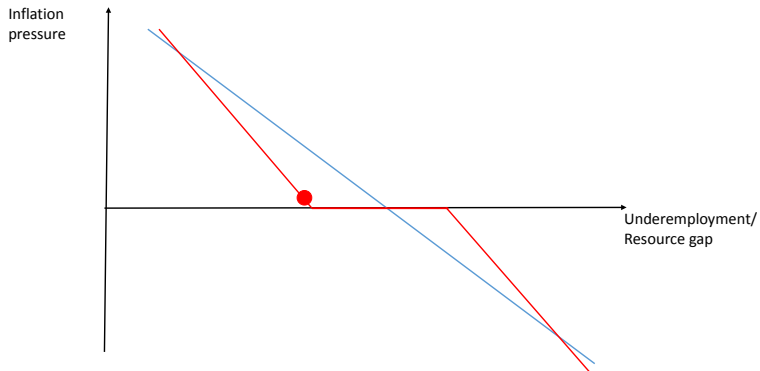
A nonlinear Phillips curve



Resource gaps do not materially influence inflation when small. As long as the unemployment rate is close to the natural rate, price stability is preserved.



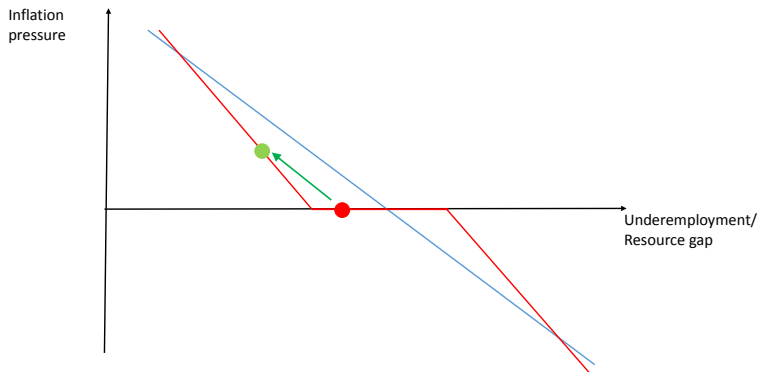
A nonlinear Phillips curve



Where is the US economy at present? What if the Phillips curve is non-linear and the economy is at the edge of the “safe” region.



A nonlinear Phillips curve



Continued accommodation with overheated labor market **at present** would necessitate massive tightening to restore price stability in the **future**.



Risk Scenarios

- ▶ Risk scenarios can be used to stress test policy.
- ▶ Even when baseline model has known flaws.
- ▶ An example: FRB/US risk scenarios at the September 2012 FOMC meeting



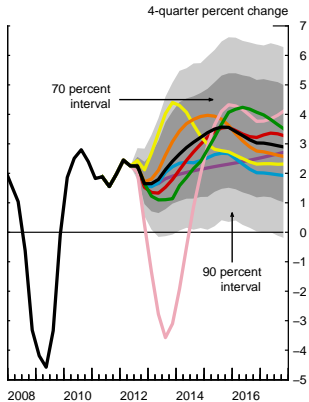
Risk Scenarios: September 2012 FOMC meeting

Forecast Confidence Intervals and Alternative Scenarios

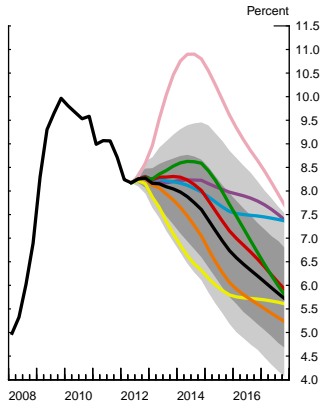
Confidence Intervals Based on FRB/US Stochastic Simulations

- | | | |
|--|----------------------------|------------------------|
| ■ Extended Tealbook baseline | ■ Faster European recovery | ■ Damaged labor market |
| ■ Fiscal cliff | ■ Faster domestic recovery | ■ Protracted headwinds |
| ■ European crisis with severe spillovers | ■ Higher oil prices | |

Real GDP



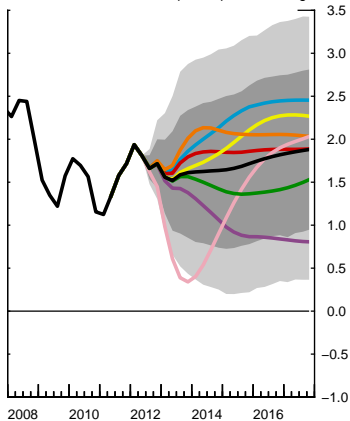
Unemployment Rate



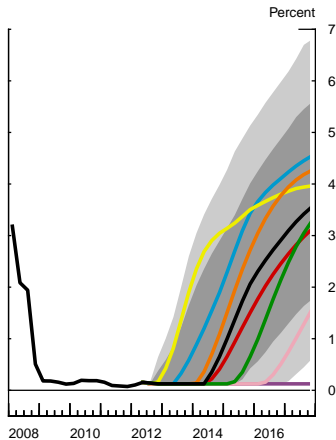
Risk Scenarios: September 2012 FOMC meeting

Risks & Uncertainty

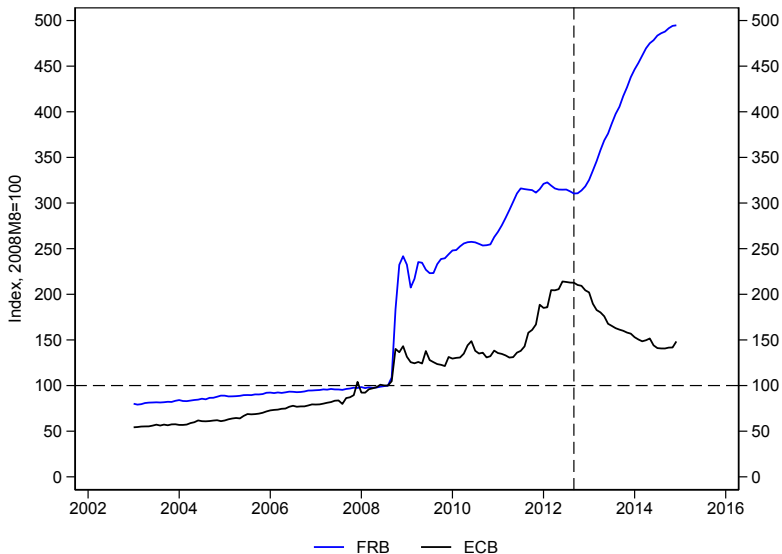
PCE Prices excluding Food and Energy
4-quarter percent change



Federal Funds Rate



Central bank balance sheet size



Core inflation

