Oil Shocks and the Zero Bound on Nominal Interest Rates

Martin Bodenstein Luca Guerrieri Christopher J. Gust

Discussion by Zeno Enders

July 2010

Summary

Question: how does the international transmission of an oil demand shock change, if one country is at the zero lower bound (zlb)?

Summary

Question: how does the international transmission of an oil demand shock change, if one country is at the zero lower bound (zlb)?

Authors develop a medium-scale international DSGE model with an oil sector, building on previous work

Summary

Question: how does the international transmission of an oil demand shock change, if one country is at the zero lower bound (zlb)?

Authors develop a medium-scale international DSGE model with an oil sector, building on previous work

Answer: foreign oil demand shock increases domestic GDP

Summary

Question: how does the international transmission of an oil demand shock change, if one country is at the zero lower bound (zlb)?

Authors develop a medium-scale international DSGE model with an oil sector, building on previous work

Answer: foreign oil demand shock increases domestic GDP

Interesting question with surprising answer

Model Setup

More or less standard two-country business cycle model

Model Setup

More or less standard two-country business cycle model

Each country has endowment of oil

Model Setup

More or less standard two-country business cycle model

Each country has endowment of oil

Oil is used for production of intermediate goods and again for production of consumption goods

Model Setup

More or less standard two-country business cycle model

Each country has endowment of oil

Oil is used for production of intermediate goods and again for production of consumption goods

Nominal and real rigidities:

Model Setup

More or less standard two-country business cycle model

Each country has endowment of oil

Oil is used for production of intermediate goods and again for production of consumption goods

Nominal and real rigidities:

- Sticky prices and wages

Model Setup

More or less standard two-country business cycle model

Each country has endowment of oil

Oil is used for production of intermediate goods and again for production of consumption goods

Nominal and real rigidities:

- Sticky prices and wages
- Lagged price and wage indexation

Model Setup

More or less standard two-country business cycle model

Each country has endowment of oil

Oil is used for production of intermediate goods and again for production of consumption goods

Nominal and real rigidities:

- Sticky prices and wages
- Lagged price and wage indexation
- Consumption habits

Model Setup

More or less standard two-country business cycle model

Each country has endowment of oil

Oil is used for production of intermediate goods and again for production of consumption goods

Nominal and real rigidities:

- Sticky prices and wages
- Lagged price and wage indexation
- Consumption habits
- Investment adjustment costs

Experiment

Preference shock brings about severe recession (C -20%)

Experiment

Preference shock brings about severe recession (C -20%)

Zero lower bound is reached

Experiment

Preference shock brings about severe recession (C -20%)

Zero lower bound is reached

Foreign demand for oil increases gradually

Experiment

Preference shock brings about severe recession (C -20%)

Zero lower bound is reached

Foreign demand for oil increases gradually

Oil price and price level also increase gradually

Experiment

Preference shock brings about severe recession (C -20%)

Zero lower bound is reached

Foreign demand for oil increases gradually

Oil price and price level also increase gradually

→ Gap between actual (zero) and targeted nominal rates is reduced

Experiment

Preference shock brings about severe recession (C -20%)

Zero lower bound is reached

Foreign demand for oil increases gradually

Oil price and price level also increase gradually

→ Gap between actual (zero) and targeted nominal rates is reduced

Real interest rate declines

Experiment

Preference shock brings about severe recession (C -20%)

Zero lower bound is reached

Foreign demand for oil increases gradually

Oil price and price level also increase gradually

→ Gap between actual (zero) and targeted nominal rates is reduced

Real interest rate declines

While gross output is lower with oil shock, oil imports (used in production) fall → GDP rises

Discussion

- Path of oil price
- Calibration
- Monetary policy
- Sensitivity

Path of oil price

As in, e.g., Christiano et al. '09, increase in expected inflation is beneficial at zlb

Path of oil price

As in, e.g., Christiano et al. '09, increase in expected inflation is beneficial at zlb

Here, inflation prospects increase via anticipated oil price path, driven by foreign oil demand that follows AR(2) process (not shown)

Path of oil price

As in, e.g., Christiano et al. '09, increase in expected inflation is beneficial at zlb

Here, inflation prospects increase via anticipated oil price path, driven by foreign oil demand that follows AR(2) process (not shown)

Is this a likely scenario?
(China's PMI fell from 57 to 51 points since January)

Path of oil price

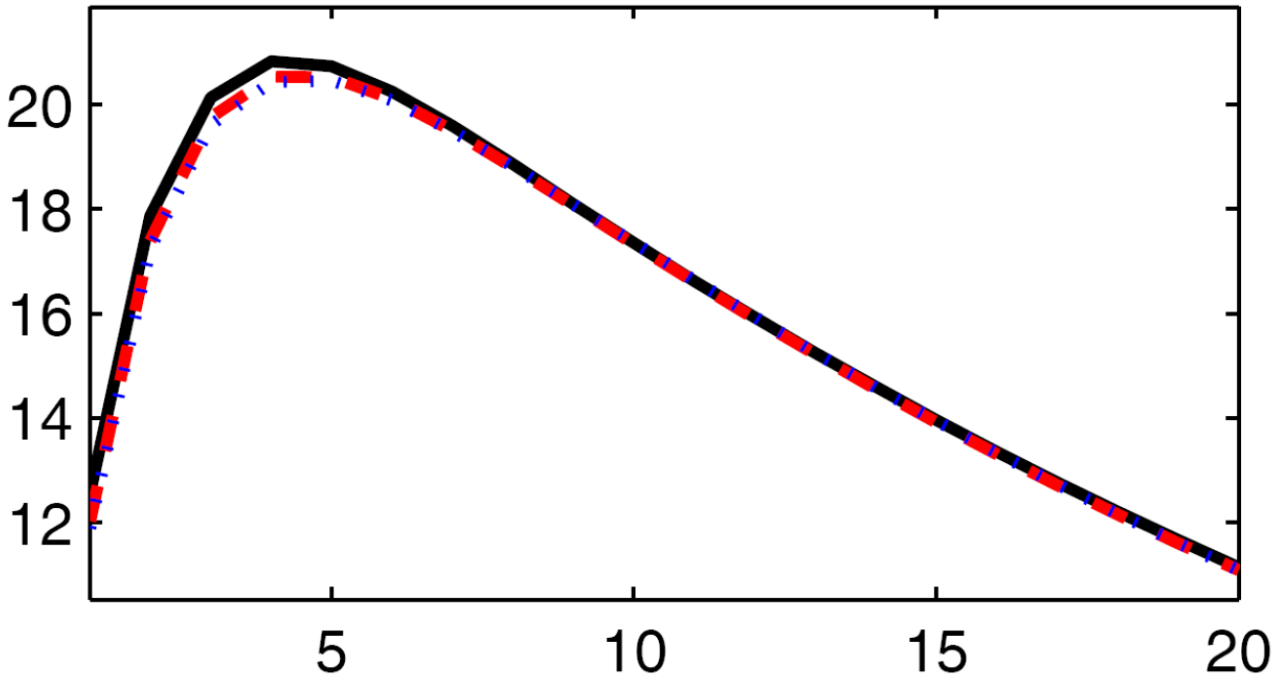
As in, e.g., Christiano et al. '09, increase in expected inflation is beneficial at zlb

Here, inflation prospects increase via anticipated oil price path, driven by foreign oil demand that follows AR(2) process (not shown)

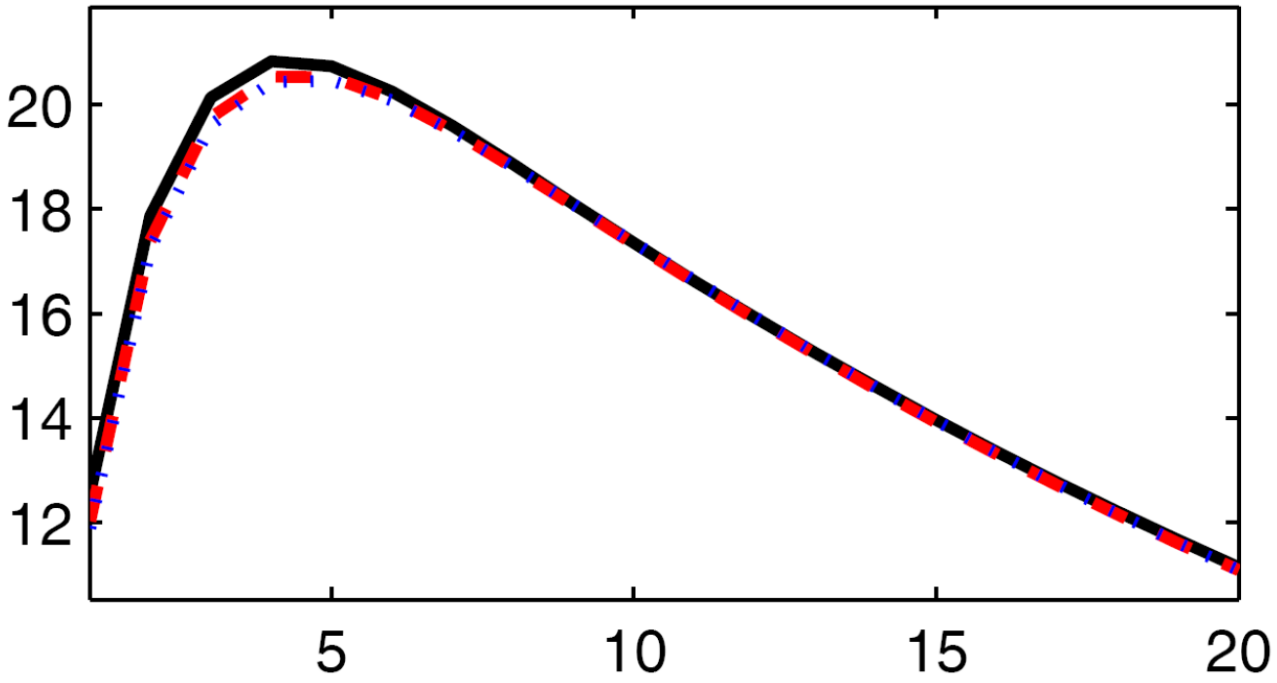
Is this a likely scenario?
(China's PMI fell from 57 to 51 points since January)

Furthermore, oil price is problematic as vehicle for anticipated inflation

Path of oil price

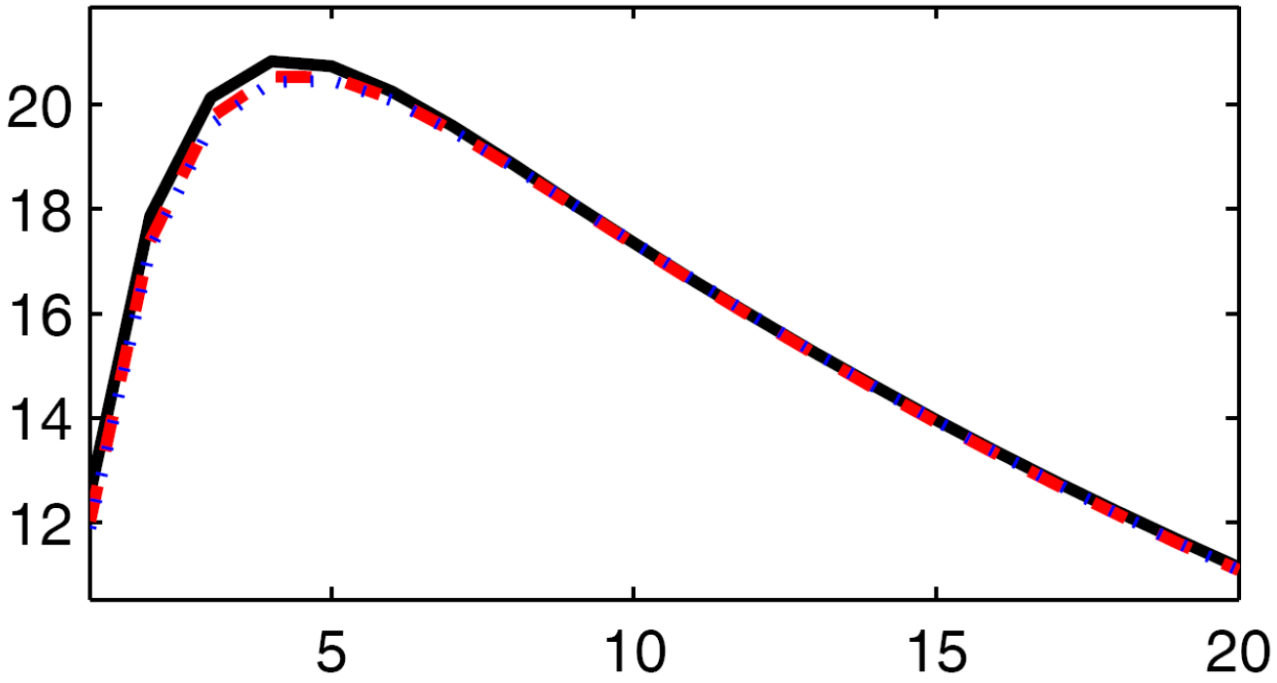


Path of oil price



Complete path anticipated

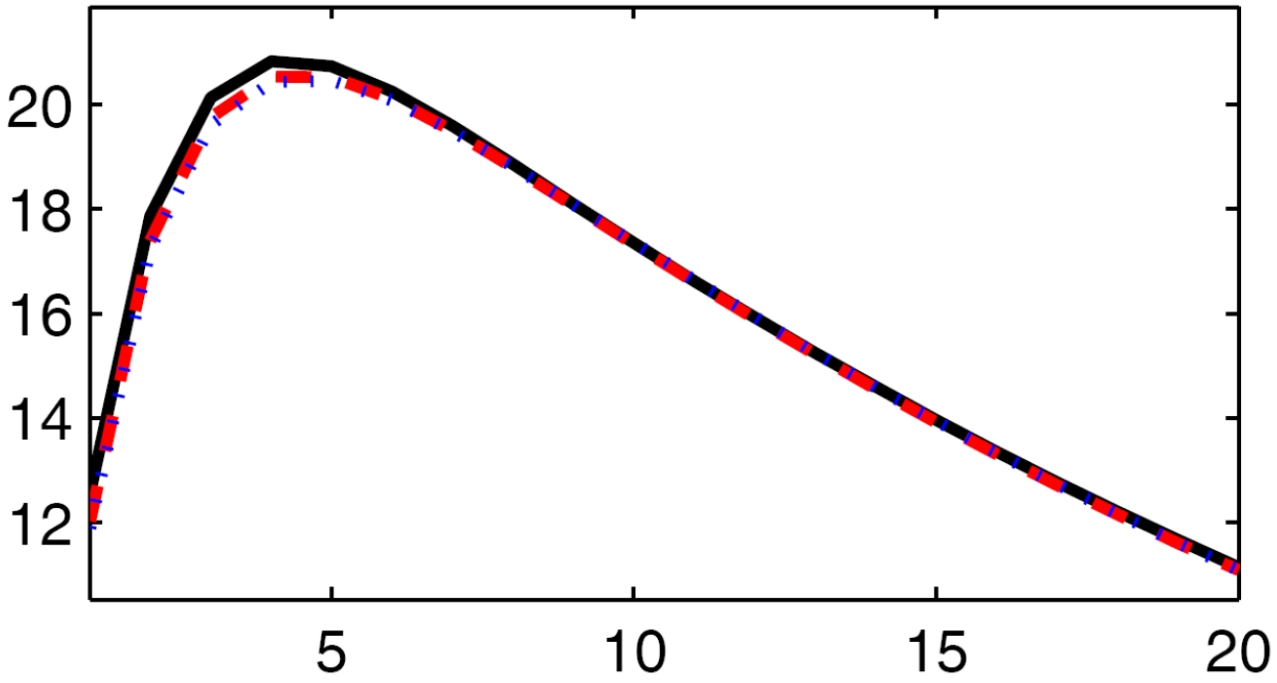
Path of oil price



Complete path anticipated

Empirically, oil price is a random walk (Abosedra '05) b/c speculative price, but oil not storable in the model

Path of oil price

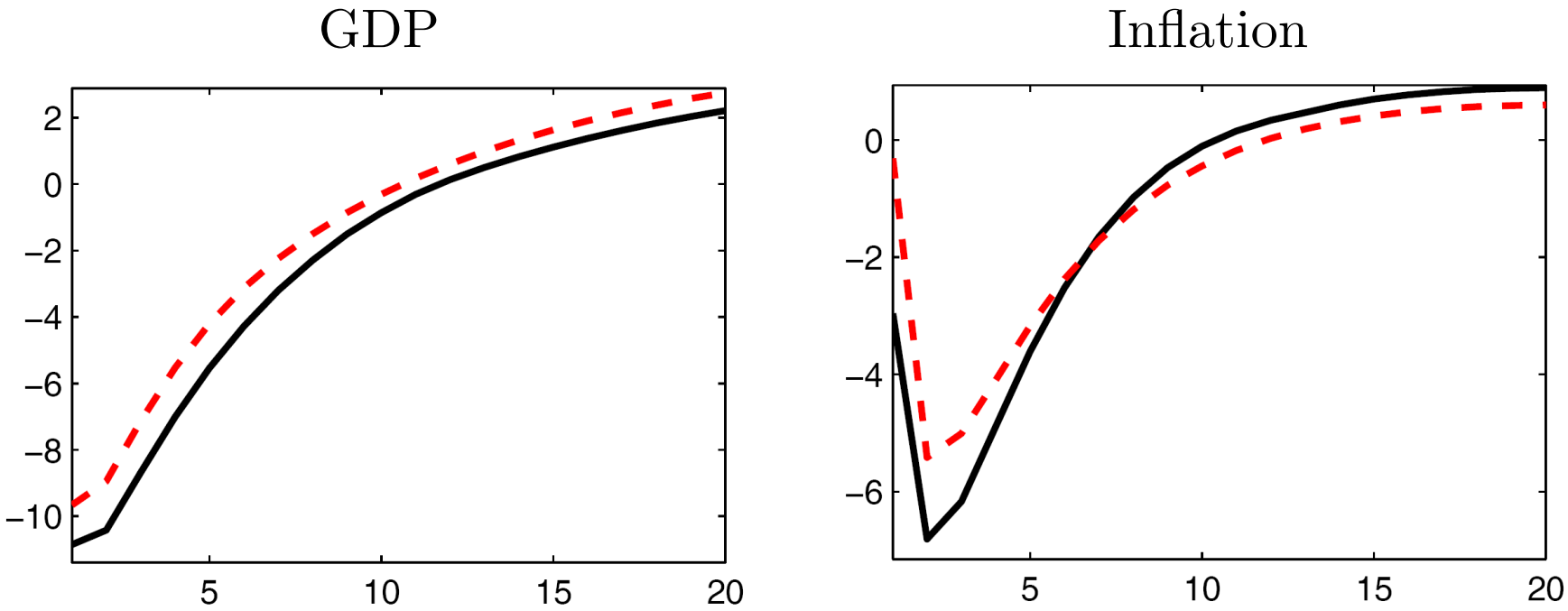


Complete path anticipated

Empirically, oil price is a random walk (Abosedra '05) b/c speculative price, but oil not storable in the model

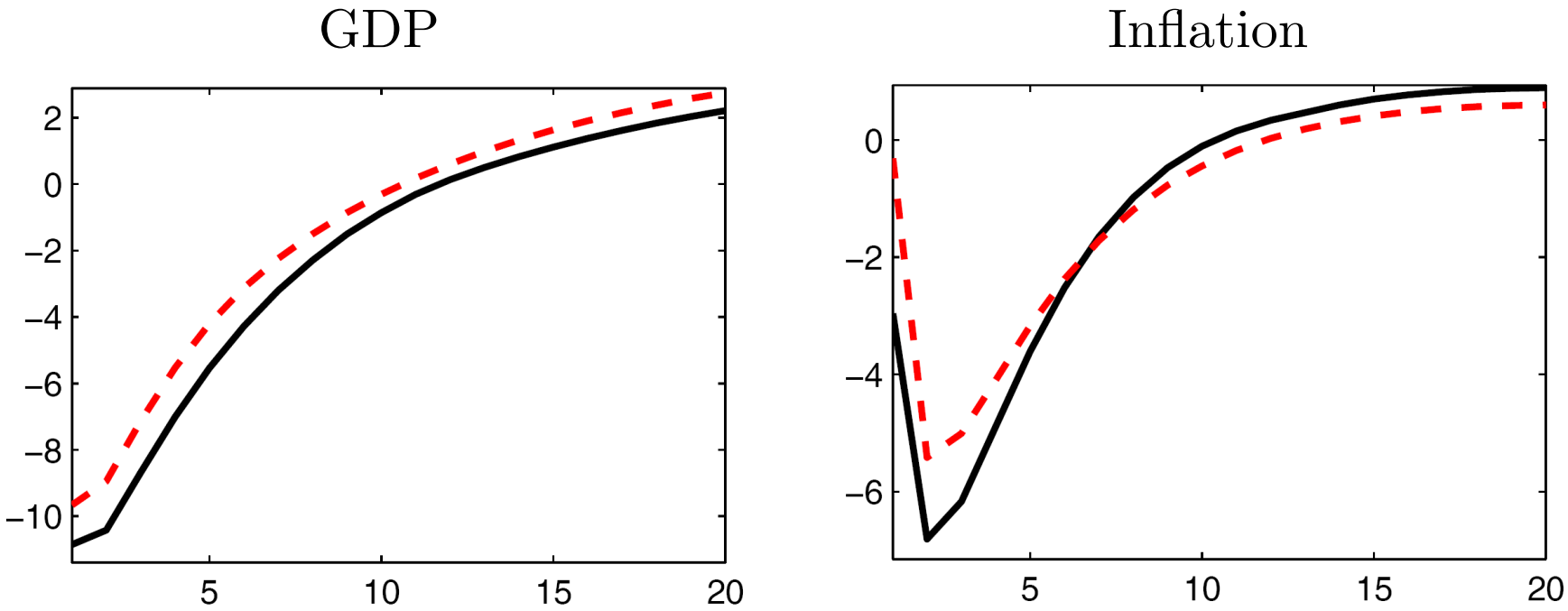
RW: less expected inflation, GDP effects might vanish

Calibration



Severe recession creates deflation

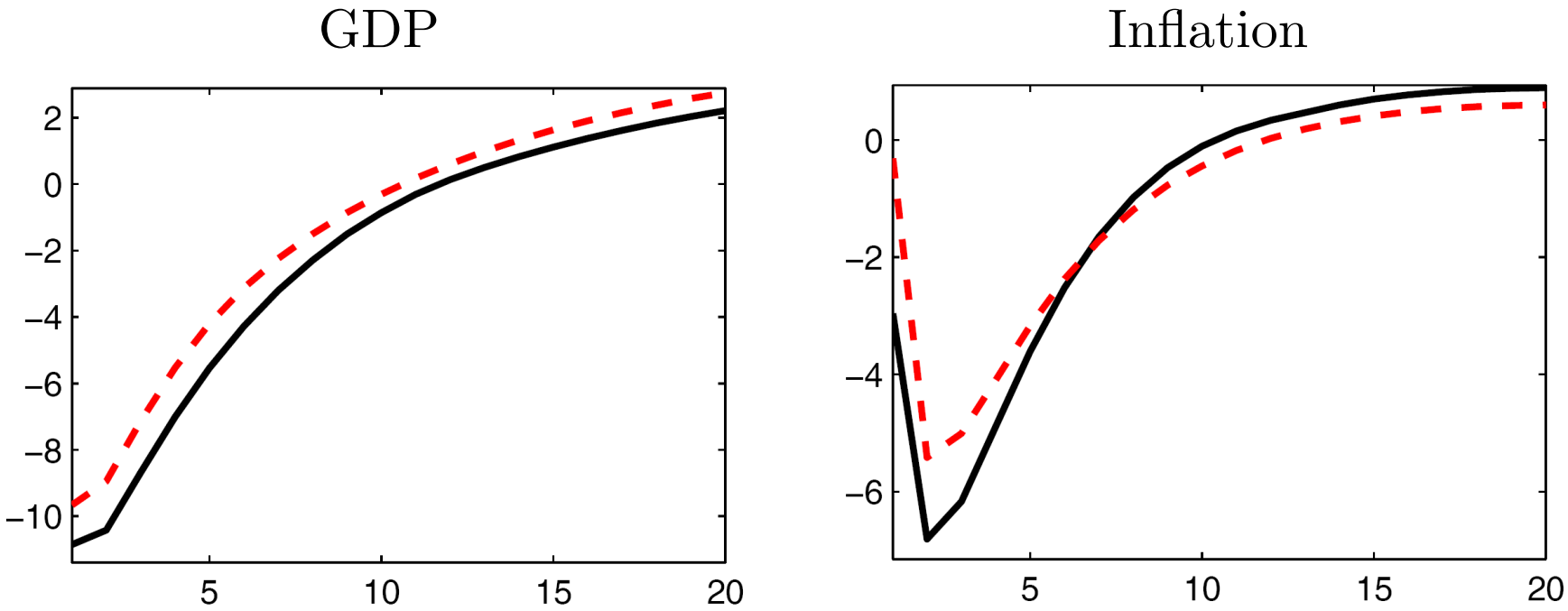
Calibration



Severe recession creates deflation

Not observed in the US

Calibration

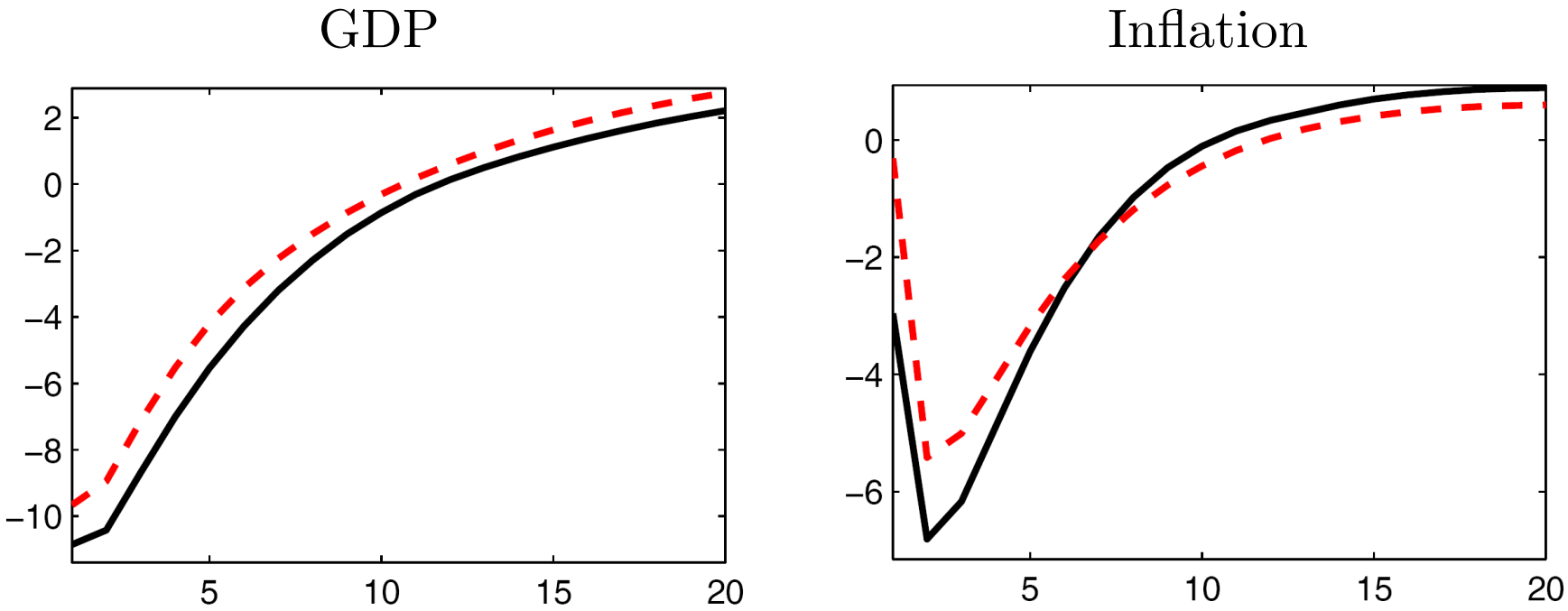


Severe recession creates deflation

Not observed in the US

Erceg & Lindé: case for flatter Philips Curve

Calibration



Severe recession creates deflation

Not observed in the US

Erceg & Lindé: case for flatter Philips Curve

In this case, output effect much smaller

Monetary Policy

In the model, policy makers do not change behavior at zlb

Monetary Policy

In the model, policy makers do not change behavior at zlb

In reality, monetary (and fiscal) policy was quite creative

Monetary Policy

In the model, policy makers do not change behavior at zlb

In reality, monetary (and fiscal) policy was quite creative

Nonconventional monetary policy could make zlb less important

Monetary Policy

In the model, policy makers do not change behavior at zlb

In reality, monetary (and fiscal) policy was quite creative

Nonconventional monetary policy could make zlb less important

Even without, might be optimal to stay longer at the zlb, thereby changing dynamics (Eggerston/Woodford '03)

Sensitivity

Relatively high weight of 2 on inflation in Taylor rule (might shorten zlb after inflationary shock)

Sensitivity

Relatively high weight of 2 on inflation in Taylor rule (might shorten zlb after inflationary shock)

How important are GHH preferences?
(higher consumption today could reduce labor supply, lowering GDP)

Sensitivity

Relatively high weight of 2 on inflation in Taylor rule (might shorten zlb after inflationary shock)

How important are GHH preferences?
(higher consumption today could reduce labor supply, lowering GDP)

How important are different oil intensities of Home and Foreign?

Sensitivity

Relatively high weight of 2 on inflation in Taylor rule (might shorten zlb after inflationary shock)

How important are GHH preferences?
(higher consumption today could reduce labor supply, lowering GDP)

How important are different oil intensities of Home and Foreign?

How important oil price elasticity of 0.38?
(large price movements)

Conclusion

Interesting experiment, deepens our understanding of zlb

Conclusion

Interesting experiment, deepens our understanding of zlb

Authors provide clear intuition about effects

Conclusion

Interesting experiment, deepens our understanding of zlb

Authors provide clear intuition about effects

Conduct several robustness checks

Conclusion

Interesting experiment, deepens our understanding of zlb

Authors provide clear intuition about effects

Conduct several robustness checks

Suggestions:

Conclusion

Interesting experiment, deepens our understanding of zlb

Authors provide clear intuition about effects

Conduct several robustness checks

Suggestions:

- Clearly state motivation

Conclusion

Interesting experiment, deepens our understanding of zlb

Authors provide clear intuition about effects

Conduct several robustness checks

Suggestions:

- Clearly state motivation
- Welfare: is this oil shock beneficial?

Conclusion

Interesting experiment, deepens our understanding of zlb

Authors provide clear intuition about effects

Conduct several robustness checks

Suggestions:

- Clearly state motivation
- Welfare: is this oil shock beneficial?
- Policy implication: anticipated import/energy tax?