Discussion of

"What to Expect from the Lower Bound on Interest Rates: Evidence from Derivatives Prices"

By Thomas M. Mertens and John C. Williams

EFA Annual Meeting 2019, Nova SBE, Carcavelos, Portugal

Roberto M. Billi

Sveriges Riksbank

22 August 2019

The "perils" of the lower bound on interest rates and the "wisdom" of financial markets

- The authors seek to investigate whether the (effective) lower bound on nominal interest rates *distorts* expectations of future inflation and interest rates, as priced in US financial markets.

- They employ a standard, small New Keynesian model to derive testable implications regarding *two* potential and distinct equilibria of the economy, i.e. a "target equilibrium" vs. a "liquidity trap equilibrium."

- Next they use *options data* to study whether the recent decline in the natural rate of interest can result in forecast densities consistent with the predictions of the above model.

- In brief, based on a reasonable theory and a careful empirical analysis, the authors' findings suggest that financial markets *do not fear* the economy falling into a liquidity trap.

The "perils" of the lower bound on interest rates and the "wisdom" of financial markets

- The authors seek to investigate whether the (effective) lower bound on nominal interest rates *distorts* expectations of future inflation and interest rates, as priced in US financial markets.

- They employ a standard, small New Keynesian model to derive testable implications regarding *two* potential and distinct equilibria of the economy, i.e. a "target equilibrium" vs. a "liquidity trap equilibrium."

- Next they use *options data* to study whether the recent decline in the natural rate of interest can result in forecast densities consistent with the predictions of the above model.

- In brief, based on a reasonable theory and a careful empirical analysis, the authors' findings suggest that financial markets *do not fear* the economy falling into a liquidity trap.

The "perils" of the lower bound on interest rates and the "wisdom" of financial markets

- The authors seek to investigate whether the (effective) lower bound on nominal interest rates *distorts* expectations of future inflation and interest rates, as priced in US financial markets.

- They employ a standard, small New Keynesian model to derive testable implications regarding *two* potential and distinct equilibria of the economy, i.e. a "target equilibrium" vs. a "liquidity trap equilibrium."

- Next they use *options data* to study whether the recent decline in the natural rate of interest can result in forecast densities consistent with the predictions of the above model.

- In brief, based on a reasonable theory and a careful empirical analysis, the authors' findings suggest that financial markets *do not fear* the economy falling into a liquidity trap.

The "perils" of the lower bound on interest rates and the "wisdom" of financial markets

- The authors seek to investigate whether the (effective) lower bound on nominal interest rates *distorts* expectations of future inflation and interest rates, as priced in US financial markets.

- They employ a standard, small New Keynesian model to derive testable implications regarding *two* potential and distinct equilibria of the economy, i.e. a "target equilibrium" vs. a "liquidity trap equilibrium."

- Next they use *options data* to study whether the recent decline in the natural rate of interest can result in forecast densities consistent with the predictions of the above model.

- In brief, based on a reasonable theory and a careful empirical analysis, the authors' findings suggest that financial markets *do not fear* the economy falling into a liquidity trap.

Key ingredients of the theoretical model and shocks buffeting the economy

- The authors employ a basic New Keynesian model with *two* sources of fluctuations in the economy:

  - Supply side (Phillips curve) buffeted by *i.i.d.* "mark-up shocks"
  - Demand side (dynamic IS eq.) hit by *i.i.d.* "demand shocks"

- A "conventional" description of monetary policy as in the optimal policy literature: the central bank operates under *optimal discretion*, and sets the nominal interest rate subject to an (effective) lower bound.

- In such a setting, when facing large "adverse" shocks, the central bank finds itself constrained by the lower bound, and thus its inability to cut interest rates any further leads to downward pressure on inflation in the economy.

- What type of shock is likely, however, to push the nominal interest rate to the lower bound?

Key ingredients of the theoretical model and shocks buffeting the economy

- The authors employ a basic New Keynesian model with *two* sources of fluctuations in the economy:
    - Supply side (Phillips curve) buffeted by *i.i.d.* "mark-up shocks"
    - Demand side (dynamic IS eq.) hit by *i.i.d.* "demand shocks"

- A "conventional" description of monetary policy as in the optimal policy literature: the central bank operates under *optimal discretion*, and sets the nominal interest rate subject to an (effective) lower bound.

- In such a setting, when facing large "adverse" shocks, the central bank finds itself constrained by the lower bound, and thus its inability to cut interest rates any further leads to downward pressure on inflation in the economy.

- What type of shock is likely, however, to push the nominal interest rate to the lower bound?

Key ingredients of the theoretical model and shocks buffeting the economy

- The authors employ a basic New Keynesian model with *two* sources of fluctuations in the economy:
  - Supply side (Phillips curve) buffeted by *i.i.d.* "mark-up shocks"
  - Demand side (dynamic IS eq.) hit by *i.i.d.* "demand shocks"

- A "conventional" description of monetary policy as in the optimal policy literature: the central bank operates under *optimal discretion*, and sets the nominal interest rate subject to an (effective) lower bound.

- In such a setting, when facing large "adverse" shocks, the central bank finds itself constrained by the lower bound, and thus its inability to cut interest rates any further leads to downward pressure on inflation in the economy.

- What type of shock is likely, however, to push the nominal interest rate to the lower bound?

Key ingredients of the theoretical model and shocks buffeting the economy

- The authors employ a basic New Keynesian model with *two* sources of fluctuations in the economy:
  - Supply side (Phillips curve) buffeted by *i.i.d.* "mark-up shocks"
  - Demand side (dynamic IS eq.) hit by *i.i.d.* "demand shocks"
- A "conventional" description of monetary policy as in the optimal policy literature: the central bank operates under *optimal discretion*, and sets the nominal interest rate subject to an (effective) lower bound.
- In such a setting, when facing large "adverse" shocks, the central bank finds itself constrained by the lower bound, and thus its inability to cut interest rates any further leads to downward pressure on inflation in the economy.
- What type of shock is likely, however, to push the nominal interest rate to the lower bound?

Key ingredients of the theoretical model and shocks buffeting the economy

- The authors employ a basic New Keynesian model with *two* sources of fluctuations in the economy:
  - Supply side (Phillips curve) buffeted by *i.i.d.* "mark-up shocks"
  - Demand side (dynamic IS eq.) hit by *i.i.d.* "demand shocks"

- A "conventional" description of monetary policy as in the optimal policy literature: the central bank operates under *optimal discretion*, and sets the nominal interest rate subject to an (effective) lower bound.

- In such a setting, when facing large "adverse" shocks, the central bank finds itself constrained by the lower bound, and thus its inability to cut interest rates any further leads to downward pressure on inflation in the economy.

- What type of shock is likely, however, to push the nominal interest rate to the lower bound?

Key ingredients of the theoretical model and shocks buffeting the economy

- The authors employ a basic New Keynesian model with *two* sources of fluctuations in the economy:
  - Supply side (Phillips curve) buffeted by *i.i.d.* "mark-up shocks"
  - Demand side (dynamic IS eq.) hit by *i.i.d.* "demand shocks"

- A "conventional" description of monetary policy as in the optimal policy literature: the central bank operates under *optimal discretion*, and sets the nominal interest rate subject to an (effective) lower bound.

- In such a setting, when facing large "adverse" shocks, the central bank finds itself constrained by the lower bound, and thus its inability to cut interest rates any further leads to downward pressure on inflation in the economy.

- What type of shock is likely, however, to push the nominal interest rate to the lower bound?

Two eqilibria in the theoretical model, and the effects of a decline in the natural rate

- Facing the lower bound, two equilibria arise in the model:
    1. Target eq.: interest rate at natural rate, and inflation at target
    2. Liquidity trap eq.: interest rate stuck at the lower bound, and thus inflation falls below target

- Effects of an exogenous *decline* in the natural rate of interest:

Two eqilibria in the theoretical model, and the effects of a decline in the natural rate

- Facing the lower bound, two equilibria arise in the model:

  1. Target eq.: interest rate at natural rate, and inflation at target
  2. Liquidity trap eq.: interest rate stuck at the lower bound, and thus inflation falls below target

- Effects of an exogenous *decline* in the natural rate of interest:

Two eqilibria in the theoretical model, and the effects of a decline in the natural rate

- Facing the lower bound, two equilibria arise in the model:
    1. Target eq.: interest rate at natural rate, and inflation at target
    2. Liquidity trap eq.: interest rate stuck at the lower bound, and thus inflation falls below target

- Effects of an exogenous *decline* in the natural rate of interest:
    1. Target eq.: the interest rate falls
    2. Liquidity trap eq.: inflation will more likely fall in order for the real interest rate to level

Two eqilibria in the theoretical model, and the effects of a decline in the natural rate

- Facing the lower bound, two equilibria arise in the model:
  1. Target eq.: interest rate at natural rate, and inflation at target
  2. Liquidity trap eq.: interest rate stuck at the lower bound, and thus inflation falls below target

- Effects of an exogenous *decline* in the natural rate of interest:
  1. Target eq.: the interest rate falls
  2. Liquidity trap eq.: mean inflation must rise, in order for the Fisher equation to hold

Two eqilibria in the theoretical model, and the effects of a decline in the natural rate

- Facing the lower bound, two equilibria arise in the model:
    1. Target eq.: interest rate at natural rate, and inflation at target
    2. Liquidity trap eq.: interest rate stuck at the lower bound, and thus inflation falls below target

- Effects of an exogenous *decline* in the natural rate of interest:
    1. Target eq.: the interest rate falls
    2. Liquidity trap eq.: mean inflation must rise, in order for the Fisher equation to hold

Two eqilibria in the theoretical model, and the effects of a decline in the natural rate

- Facing the lower bound, two equilibria arise in the model:
  1. Target eq.: interest rate at natural rate, and inflation at target
  2. Liquidity trap eq.: interest rate stuck at the lower bound, and thus inflation falls below target

- Effects of an exogenous *decline* in the natural rate of interest:
  1. Target eq.: the interest rate falls
  2. Liquidity trap eq.: mean inflation must rise, in order for the Fisher equation to hold

What type of shock drives the nominal interest rate to the lower bound in the theoretical model?

- Next they take into account *mark-up shocks* buffeting the economy but in the absence of demand shocks. Consider first the author's example 1 with a *uniform* distribution:
  1. Target eq.: inflation falls (seems logical)
  2. Liquidity trap eq.: mean inflation rises (an artifact of the type of shock chosen?)

- What if instead *demand shocks* are assumed to drive the interest rate to the lower bound? In the liquidity trap equilibrium, a decline in the natural rate would result in a *decline* (not an increase) in the average rate of inflation.

- In the author's example 2 with a *normal* distribution, both mark-up *and* demand shocks buffet the economy. But which of them pushes the interest rate to the lower bound? Seems to be again the mark-up shock in the results reported.

What type of shock drives the nominal interest rate to the lower bound in the theoretical model?

- Next they take into account *mark-up shocks* buffeting the economy but in the absence of demand shocks. Consider first the author's example 1 with a *uniform* distribution:

  1. Target eq.: inflation falls (seems logical)
  2. Liquidity trap eq.: mean inflation rises (an artifact of the type of shock chosen?)

- What if instead *demand shocks* are assumed to drive the interest rate to the lower bound? In the liquidity trap equilibrium, a decline in the natural rate would result in a *decline* (not an increase) in the average rate of inflation.

- In the author's example 2 with a *normal* distribution, both mark-up *and* demand shocks buffet the economy. But which of them pushes the interest rate to the lower bound? Seems to be again the mark-up shock in the results reported.

What type of shock drives the nominal interest rate to the lower bound in the theoretical model?

- Next they take into account *mark-up shocks* buffeting the economy but in the absence of demand shocks. Consider first the author's example 1 with a *uniform* distribution:

  1. Target eq.: inflation falls (seems logical)
  2. Liquidity trap eq.: mean inflation rises (an artifact of the type of shock chosen?)

- What if instead *demand shocks* are assumed to drive the interest rate to the lower bound? In the liquidity trap equilibrium, a decline in the natural rate would result in a *decline* (not an increase) in the average rate of inflation.

- In the author's example 2 with a *normal* distribution, both mark-up *and* demand shocks buffet the economy. But which of them pushes the interest rate to the lower bound? Seems to be again the mark-up shock in the results reported.

What type of shock drives the nominal interest rate to the lower bound in the theoretical model?

- Next they take into account *mark-up shocks* buffeting the economy but in the absence of demand shocks. Consider first the author's example 1 with a *uniform* distribution:

  1. Target eq.: inflation falls (seems logical)
  2. Liquidity trap eq.: mean inflation rises (an artifact of the type of shock chosen?)

- What if instead *demand shocks* are assumed to drive the interest rate to the lower bound? In the liquidity trap equilibrium, a decline in the natural rate would result in a *decline* (not an increase) in the average rate of inflation.

- In the author's example 2 with a *normal* distribution, both mark-up *and* demand shocks buffet the economy. But which of them pushes the interest rate to the lower bound? Seems to be again the mark-up shock in the results reported.

What type of shock drives the nominal interest rate to the lower bound in the theoretical model?

- Next they take into account *mark-up shocks* buffeting the economy but in the absence of demand shocks. Consider first the author's example 1 with a *uniform* distribution:

    1. Target eq.: inflation falls (seems logical)
    2. Liquidity trap eq.: mean inflation rises (an artifact of the type of shock chosen?)

- What if instead *demand shocks* are assumed to drive the interest rate to the lower bound? In the liquidity trap equilibrium, a decline in the natural rate would result in a *decline* (not an increase) in the average rate of inflation.

- In the author's example 2 with a *normal* distribution, both mark-up *and* demand shocks buffet the economy. But which of them pushes the interest rate to the lower bound? Seems to be again the mark-up shock in the results reported.

In sum—which testable implications to bring to the data?

- The authors develop a *reasonable* theory and assess it *care*fully in financial data.

- As a caveat, however, the testable implications derived from the theoretical model *depend* on the shocks assumed to push the interest rate to the lower bound.

- Overall, as they find, financial markets seem *not to fear* the economy falling into a liquidity trap.