Financial Frictions, Monetary Policy, and Exchange Rates

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Introduction and Motivation

• In our discussion of the NK model, we stressed the assumption of frictionless financial markets
• This assumption seems too strong
• Also, the global financial crisis and its aftermath have directed attention to distortions in the financial sector and their macro implications
USA: Real Estate Price Index
(S&P/Case-Shiller 20 City Composite Index)
Source: MacroMarkets
Real Interest Rates, 1999-2006

10-Year 3-7/8% Treasury Inflation-Indexed Note. Source: FRED, Federal Reserve Bank of St. Louis
TED Spread (LIBOR Versus T-Bill, percentage points)
US: GDP Growth (% last 12 months)

Source: FRED, St. Louis Fed
Why Financial Imperfections May Be Crucial

- Large changes in relative prices are often seen and create winners and losers
- Examples: real estate prices, stocks and bonds, exchange rates
- Conventional macroeconomics has largely ignored these, believing that redistribution has negligible aggregate effects
- That belief is appropriate if financial markets are perfect
Fisherian Deflation
Fisherian Deflation

• Irving Fischer (1932): redistribution can have large aggregate effects
• In particular, if debts are written in nominal terms, deflation increases their real value
• The resulting redistribution matters in the aggregate because debtors have a higher marginal propensity to spend than creditors
• A modern rendition of Fisher’s argument: Eggertsson-Krugman
• The basic idea: there is a set of debt-constrained agents, whose consumption falls sharply if their debt limit is reduced
• While debts may be denominated in dollars, debt limits may be set in real terms
• Aggregate demand can then fall if there is deflation
The AD-AS diagram

- Recall the AD-AS diagram from undergraduate Macro courses
- It can be obtained from basic NK models, too
“Bizarre Macro”

- When debts are denominated in nominal terms, price *deflation* redistributes wealth from debtors to creditors.
- If financial frictions are substantial, debtors may reduce demand more than creditors increase theirs.
- Deflation can then *reduce* aggregate demand → a upward sloping AD.
Bizarre Macro

\( \pi_s \)

\( Y_s \)
Consequences

• AD curve can have a positive slope
• “Paradox of toil”
• “Paradox of flexibility”
• Inflation is very expansionary (and deflation very contractionary)
• Fiscal policy is particularly effective
The Paradox of Toil

• In a bizarre world, a productivity increase can lead to a fall in output

• This is because higher productivity leads to lower prices, which (under bizarre world assumptions) can reduce aggregate demand
Conventional Macro

$\pi_s$

$Y_s$

AS

AD
Conventional Impact of a Productivity Increase
Bizarre Macro

π

Y

π

Y

AD

AS
The Paradox of Toil
Paradox of Flexibility

• Likewise, in a bizarre world, a fall in aggregate demand can be more contractionary if prices are more flexible

• This is because more price flexibility implies a steeper AS curve
Conventional: Price Flexibility Implies a Steeper AS
Conventional: A fall in demand is less contractionary if prices are more flexible.
In a bizarre macro world…
..the opposite is true: Paradox of Flexibility
The Effectiveness of Fiscal Policy

• In a conventional world, increased fiscal expenditure leads to inflation, which offsets some of the expansionary effects

• In a bizarre world, inflation reinforces the expansionary effects
Fiscal Policy

\[ \pi_s \]

\[ Y_s \]

AS

AD_{bizarre}

AD_{conventional}
Fiscal Policy

\[
\begin{align*}
\pi_s & \quad \text{Y}_s \\
\text{AS} & \quad \text{AD}_{bizarre} \quad \text{AD}_{conventional}
\end{align*}
\]
The Open Economy: Balance Sheets, and Exchange Rates
Motivation: Dollarization and the Fixed vs Flexible Rates Debate

• Asian Crisis of 1990s: Exchange Rate depreciations were observed to be contractionary

• Explanation: Currency Mismatches

• To “work”, one needs financial frictions and balance sheet effects

• Intuition: Céspedes, Chang, Velasco
The IS

\[ y = \alpha_i i + \alpha_x x + \alpha_e e \]

- \( y \): output demand
- There is a demand component that increases with \( e \) (real exchange rate) for usual reasons
- \( i \): investment
- \( x \): exogenous component of demand
The central bank is assumed to fix exchange rates, so there is no need to specify the LM.
The BP

• The key relation
• Start with investment demand:

\[ i = - (\rho + \eta) + \gamma e \]

Similar to usual assumption, but:

\( \rho \): world interest rate

\( \eta \): a “risk premium”
• The key aspect of the model is that the risk premium \( \eta \) depends on the value of investment relative to corporate net worth.

• The idea, originally due to Bernanke and Gertler, can be derived from microeconomic models of debt contracts.
Risk premia

$$\eta = \mu [(1-\gamma)e + i - n]$$

- Can be derived from more basic models of financial frictions
- $n$: corporate *net worth*, in terms of domestic goods
Corporate Balances

\[ n = \delta_{yw} - \delta_e e \]

\( \Rightarrow \) \( \delta_e \) depends on corporate debt and currency mismatches

\( \Rightarrow \) A highly dollarized economy is likely to have a larger \( \delta_e \)
The BP

• Combining two preceding equations,

\[ \eta = \mu \left[(1-\gamma + \delta_e)e + i - \delta_y y \right] \]

• Inserting in investment demand, one gets the BP relation:

\[ (1+\mu) i = -\rho + \mu \delta_y y + \left[ \gamma - \mu (1-\gamma + \delta_e) \right]e \]
Two types of Economies

$$(1 + \mu) i = -\rho + \mu \delta \gamma + [\gamma - \mu (1 - \gamma + \delta_e)]e$$

• If $\gamma > \mu (1 - \gamma + \delta_e)$, we say that the economy is *financially robust*

• Otherwise, we say that it is *fragile*.
Implications

• Consider the impact of an exogenous increase in demand (modeled as an unanticipated increase in \( x \))

• This can be due to a fall in exports or government expenditure
A fall in Exports
• Note that balance sheet effects help *amplifying* the impact of an $x$ shock
Without financial frictions, equilibrium would be at $A'$. 
• Now, consider an increase in the world interest rate $\rho$
An increase in the world interest rate
Contractionary Depreciation

- Finally, what happens if there is an exchange rate depreciation?
- Recall that in the conventional model, a depreciation is always expansionary
- Here, it can be contractionary instead
Depreciation…
Depreciation in a *robust* economy
Depreciation in *fragile* economy
Depreciation in *fragile* economy
Summary and Takeaway

1. In a small open economy with financial frictions, the cost of capital may depend on the real value of corporate net worth.

2. An exchange rate depreciation can cause a steep fall in net worth, especially if the economy is dollarized.

3. This can reduce investment and aggregate demand.
Summary and Takeaway

4. Under such conditions, exchange rate depreciation can be contractionary rather than expansionary.

5. Also, such effects can exacerbate the amplification and persistence of shocks.
Some Further Implications

• This analysis may explain why central bankers in developing countries often suffer from *fear of floating*

• The analysis of exchange rates depends on the degree of financial development

• Rationale for *de-dollarization, leverage limits*, and other *macro-prudential* policies