Introduction to Empirical Macro-Finance

Atif Mian
Princeton University

Princeton Initiative: Macro, Money and Finance

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Outline

- Two ways to think about Macro-Finance nexus
  - business cycles
  - long-run

- Macro-Finance and the business cycle
  - The rise of “credit-driven household demand channel”
  - empirics, theory, and public policy

- Macro-Finance and the long-run
  - Understanding the causes and consequences of the global “credit super-cycle” and falling long-term real rate.
Macro-Finance and the business cycle
Macro-Finance and the business cycle

United States

Δ Unemployment, 2007−10

Δ HH debt to GDP, 2002−07

Source: Mian and Sufi (IMF, 2010).

The credit-driven household demand channel

↑ credit supply ⇒ ↑ household aggregate demand ⇒ ↓ future GDP growth.

Source: Mian, Sufi, and Verner (QJE, 2017).
Macro-Finance and the business cycle

United States

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The credit-driven household demand channel

↑ credit supply ⇒ ↑ household aggregate demand ⇒ ↓ future GDP growth.
Empirical Challenges

• How to isolate credit supply expansion?
  • ↑ in quantity and ↓ in spreads, deregulation/policy experiments, differential pass-through of global shocks (e.g. oil, securitization, savings glut)

• How to identify change in household aggregate demand?
  • Focus on nontradable/tradable sectors, relative size and prices
  • Asymmetry between household and non-financial firm credit

• Use of micro data and regional variation
International Evidence

GDP Response to HH Debt Shock

GDP Response to NF Debt Shock

Source: Mian, Sufi, and Verner (QJE, 2017)
## International Evidence

### MSV2017 30 Countries

<table>
<thead>
<tr>
<th></th>
<th>(1) $\Delta_3 Y_{it}$</th>
<th>(2) $\Delta_3 Y_{it}$</th>
<th>(3) $\Delta_3 s_{it}^{MC}$</th>
<th>(4) $\Delta_3 \ln \left( \frac{L_{it}}{P_{it}} \right)$</th>
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<tr>
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Country fixed effects: ✓ ✓ ✓

$R^2$: 0.087 0.062 0.012
Observations: 816 832 858

Standard errors in parentheses

$^+ p < 0.1$, $^* p < 0.05$, $^{**} p < 0.01$
### International Evidence

#### MSV2017 30 Countries

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- Country fixed effects: ✓ ✓ ✓ ✓ ✓ ✓
- $R^2$: 0.087 0.062 0.012 0.17 0.067
- Observations: 816 832 858 639 670

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Country fixed effects: ✓ ✓ ✓ ✓ ✓ ✓ ✓

\( R^2 \) | 0.087 0.062 0.012 0.17 0.067 0.11
Observations: 816 832 858 639 670 840

Standard errors in parentheses

\( + p < 0.1, * p < 0.05, ** p < 0.01 \)
### International Evidence

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Standard errors in parentheses

\( ^{†} p < 0.1, ^* p < 0.05, ^{**} p < 0.01 \)
Rise in household leverage predicts GDP slowdown

Source: Mian, Sufi, and Verner (QJE, 2017).
Deregulation experiment in the 1980s in U.S.

Source: Mian, Sufi, and Verner (WP, 2018).

Total Bank Credit

- Early Deregulation
- Late Deregulation

Source: Mian, Sufi, and Verner (WP, 2018).

Unemployment Rate

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**Total Bank Credit**

- Early Deregulation
- Late Deregulation

**Unemployment Rate**

Source: Mian, Sufi, and Verner (WP, 2018).
Local demand and NT / T sector expands

Non-Tradable Employment Growth, 82–89

Source: Mian, Sufi, and Verner (WP, 2018).

Tradable Employment Growth, 82–89

Deregulation exposure

Source: Mian, Sufi, and Verner (WP, 2018).
Local demand and NT / T sector expands

Non-Tradable Employment Growth, 82–89

Tradable Employment Growth, 82–89

Source: Mian, Sufi, and Verner (WP, 2018).
Local demand and NT / T price rises

Non-tradable CPI Inflation, 84–89

Source: Mian, Sufi, and Verner (WP, 2018).

Tradable CPI Inflation, 84–89

Source: Mian, Sufi, and Verner (WP, 2018).
Local demand and NT / T price rises

Non-tradable CPI Inflation, 84–89

Tradable CPI Inflation, 84–89

Deregulation exposure (Alaska excluded)

Source: Mian, Sufi, and Verner (WP, 2018).
Rise in household leverage predicts depth of 1990/91 recession

Δ Unemployment, 1989−92

Δ HH Leverage, 1982−89

Source: Mian, Sufi, and Verner (WP, 2018).
A large expansion in credit supply, Mian and Sufi (2009), (also see [1])

Credit expansion led to an increase in local demand and the non-tradable sector expanded, Di Maggio and Kermani (2017)

When the music stops, Fisher’s “debt deflation” dynamics take hold (see [2])
  - large fall in demand, Mian et al. (2013)
  - fall in employment due to demand shortgage, Mian and Sufi (2014)
  - foreclosure fire-sale externalities amplify the negative cycle, Mian et al. (2015)
The fall in demand

Fall in employment in response to demand

Source: Mian and Sufi (ECMA, 2014).
Fall in employment in response to demand

\[
\begin{array}{cccccc}
\text{Tradable Employment, 07−09} & -0.15 & -0.1 & -0.05 & 0 & 0.05 & 0.1 \\
\text{Non−Tradable Employment, 07−09} & -0.3 & -0.25 & -0.2 & -0.15 & -0.1 & -0.05 & 0 & 0.05 \\
\text{HH net worth, 06−09} & -0.15 & -0.1 & -0.05 & 0 & 0.05 & 0.1
\end{array}
\]

Source: Mian and Sufi (ECMA, 2014).

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Theoretical implications of credit-driven household demand channel
• Heterogeneity across borrowers and creditors matters as it interacts with frictions like ZLB & wage rigidity. e.g. Eggertsson and Krugman (2012), Farhi and Werning (2015), Guerrieri and Lorenzoni (2017), Schmitt-Grohé and Uribe (2016) ([3])
• Ex-ante “over-borrowing” due to AD and pecuniary externalities (see [4])

MPC out of Housing Wealth by HH Leverage, '06–09

MPB out of Housing Wealth by Credit Score, '02–06

Source: Mian and Sufi (AER, 2011).
- Systematic forecasting errors suggest a departure from rational expectations with common beliefs (See [5]).
- Important to model heterogeneous beliefs and behavioral biases, e.g. Geanakoplos (2010), Gennaioli et al. (2012), López-Salido et al. (2017) ([6]).
Public policy implications of credit-driven household demand channel

- Post-2007 policy should have focused on reducing household debt service payments and preventing foreclosures (see [8]).

- Mortgage design matters, more equity-like contracts that promote risk-sharing have benefits at the macro level

- Monetary policy pass-through depends on the credit-driven household demand channel, e.g. Di Maggio et al. (2017)

- UK and many other countries have since adopted macro-prudential regulations that impose constraints based on loan to value or debt service to income
Macro-Finance and the long-run

- Huge rise in quantity and large fall in price of credit since about 1980. Why did this happen? What are its consequences?
Macro-Finance and the long-run

- Huge rise in quantity and large fall in price of credit since about 1980. Why did this happen? What are its consequences?
• Is credit financing the supply-side of the economy?
• Is credit financing the supply-side of the economy?
Is credit financing the demand-side of the economy?
• Where is long-run credit expansion coming from?
- Where is long-run credit expansion coming from?

![Debt to Income Chart](chart.png)

Source: Mian and Sufi (WP, 2018).
What are the consequences of long-run credit expansion?
What are the consequences of long-run credit expansion?

- Equitable and balanced growth is extremely important - finance can no longer be the “shock absorber” due to liquidity traps and other maleffects of very low interest rates and high debt.

- Financial design matters as distribution matters. So need more risk-sharing across households.

- Wealth tax
Notes


Notes


5. Mian et al. (2017b), Baron and Xiong (2016)


References IV


References V


References VI


References VII


and , *House of debt: How they (and you) caused the Great Recession, and how we can prevent it from happening again*, University of Chicago Press, 2015.


and , “Inequality, Surplus Savings and Credit Creation,” 2018.


References VIII


