The Financial Origins of the Rise and Fall of American Inflation

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\textsuperscript{1}Wharton and NBER \textsuperscript{2}NYU Stern and NBER

SITE, August 2020
The Great Inflation (1965–1982)

1. A very influential period for the narrative of macro and monetary policy
   - inflation got out of control despite high interest rates
   - Keynesian toolbox stopped working: high inflation and high unemployment (“stagflation”) → a crisis of understanding

2. Standard narrative that has emerged blames the Fed
   - did not raise rates aggressively enough
     (Taylor coefficient < 1, shown by Clarida, Gali, & Gertler 2000)
   ⇒ Fed lost credibility → self-fulfilling, higher inflation expectations

3. Ended by Paul Volcker who restored Fed credibility
   - raised rates and kept them high despite severe 1981–82 recession
   - credited with lower inflation and longer expansions that followed (“Great Moderation”)
   ⇒ credibility view underlies monetary policy theory and practice today
The Great Inflation

1. Fed funds rate and CPI inflation, annual over following year:

2. Inflation rose from 2% in 1965 to 14% in 1979, back to 2% in 1982
   - 1965.I: start of Great Inflation
   - 1980.IV: Volcker’s credibility-restoring rate hike
Stagflation and instability

1. Real GDP growth is highly *negatively* related to inflation
   ⇒ Contradicts Phillips curve: high inflation ↔ low unemployment
2. GDP is very volatile: four recessions over this time period

*Drechsler, Savov, and Schnabl (2020)*
This paper: financial origins

We propose and test a new explanation for the Great Inflation

1. Due to imposition and repeal of Regulation Q
   - an important law that placed hard ceilings on bank deposit rates
   - deposits were the main form of saving for most households
     → Reg Q suppressed the return to saving
   - disabled the transmission of monetary policy to households:
     → no passthrough of Fed funds rate to deposit rates
1. 1965.I: Reg Q deposit rate ceiling becomes binding
   - previously, Fed had increased it to keep it from binding

2. No passthrough of Fed funds rate to deposit rates
1. Real deposit rate increasingly negative:
   - from +2% in 1964 to −8% in 1979
   - in contrast, real Fed funds rate ∼ 0

⇒ Reg Q cost: real deposit rate × \( \frac{\text{deposits}}{\text{consumption}} \) ≈ 4% of consumption
A new explanation for the Great Inflation

2. How does Reg Q raise inflation?

- suppressed return to saving $\rightarrow$ higher incentive to spend (aggregate demand ↑) $\rightarrow$ upward pressure on prices $\rightarrow$ higher inflation

- spiral: higher inflation $\rightarrow$ lower real deposit rate $\rightarrow$ demand increases further $\rightarrow$ inflation increases further . . .

- similar to nominal rate peg as in Friedman (1968), but with Reg Q as the relevant peg

3. How does Reg Q lead to recession (“stag” in stagflation):

- low real deposit rate $\rightarrow$ deposit outflows $\rightarrow$ banks lose funding (“disintermediation”) $\rightarrow$ credit crunch $\rightarrow$ firms constrained $\rightarrow$ output falls, unemployment rises
Credit crunch and stagflation

1. High inflation $\rightarrow$ low real rate $\rightarrow$ deposit outflows
2. Banks lose funding $\rightarrow$ credit crunch
   - “credit crunch” coined in 1966 to describe first such event
   - right after imposition of Reg Q
Credit crunch and stagflation

1. High inflation $\rightarrow$ low real rate $\rightarrow$ deposit outflows
2. Banks lose funding $\rightarrow$ credit crunch
   $\Rightarrow$ Output growth plummets
4. What ended the Great Inflation?

- Reg Q effectively repealed in late 1978–79 with the introduction of new, deregulated deposit accounts
- deposit rates immediately shot up far above the old ceilings (+7%)
- households poured vast sums into the new accounts: $462 billion = 16.2% of GDP (∼$3.5 trillion in 2019)
- removed incentive to spend, no more upward pressure on prices
Repeal of Regulation Q

2. Passthrough restored from near 0 to almost 1
3. Deposit rates immediately shot up far above the old ceilings
Repeal of Regulation Q

1. Real deposit rate shot up from $-8\%$ in 1979 to 0% in '80 and +4% in '81
2. Timing: Reg Q repealed right before inflation starts dropping
   - Volcker rate hike is 3 quarters after

Drechsler, Savov, and Schnabl (2020)
1. Inflation drops soon after deregulation, but 3 quarters before Volcker’s hike in 1980.IV
   - by 1980.III inflation already was less than 8%

2. Inflation expectations stayed high: 10-year rate at pre-Volcker levels until 1985!
   \[\Rightarrow\] investors expected inflation to return, goes against credibility view
History of Regulation Q

1. Enacted in 1933 following Depression bank failures

2. In order to prevent “excess competition” for insured deposits by banks wanting to take risk

3. Until 1965: the Fed kept the ceiling rate above the Fed funds rate → non-binding

4. In 1965: Fed stopped raising ceiling, letting it bind to slow money and credit growth

⇒ Fed believed Reg $Q$ was *reducing* inflation
   - other countries enacted similar regulations (e.g., UK)
Cross-sectional analysis

1. Aggregate time series supports the hypothesis that Reg Q led to the Great Inflation

2. To further test this hypothesis, we use cross-sectional variation in exposure to Reg Q and measure its impact on inflation
   - controls for aggregate economic conditions and helps rule out alternative explanations, e.g., Fed credibility

3. Identification challenge: Exposure to Reg Q and inflation may be responding to local economic conditions (omitted variable)

⇒ Four natural experiments covering rise and fall of Great Inflation:
   1. Reg Q first becomes binding (1965–66)
   2. NOW Account Experiment (1974–80)
   4. Banks vs. S&Ls (1966–84)
Data

Deposits:


Inflation:

1. CPI inflation (BLS, 25 largest MSAs, 1965–90)
2. Wage inflation (nominal wage growth):
   - all private sector employees (BLS, 316 MSAs, 1975–90)
   - manufacturing employees (BLS, 169 MSAs, 1972–90)
1. Reg $Q$ became binding for banks in 1965.I

2. S&Ls were exempt from Reg $Q$ until September 1966
   - due to being regulated by FHLBB, not Fed

$\Rightarrow$ Reg $Q$ less binding in S&L dominated areas over 1965.I–66.III
   - these areas should see less inflation increase

3. Identification assumption: S&L share is predetermined, not picking up other factors driving inflation in 1965–66
   - historically determined and highly persistent
S&Ls and inflation, 1965–66

\[ \pi_{i,t-1 \rightarrow t+1} = \alpha_t + \beta_t (S&L \text{ Share})_{i,1966.III} + \epsilon_{i,t} \]

1. Shows inflation increases less in S&L-dominated areas once Reg Q becomes binding for banks in 1965.I
   - gap disappears once S&Ls become subject to Reg Q in 1966.III

2. Coefficient large enough to explain aggregate inflation increase (\(\sim 3\%\))
NOW Account Experiment (middle of Great Inflation)

1. In 1972, a small bank in Worcester, MA, created the “NOW Account” (interest-paying checking account, 0 → 5%)

2. Violated Reg Q → other banks sued for “unfair” competition

3. In surprise move, MA Supreme Court authorized NOW accounts for state-chartered banks

4. National banks now lobbied D.C. to allow NOW accounts → in 1974, Congress authorized NOW Accounts in MA and NH only

5. Hugely popular: 80% penetration rate in MA

6. Staggered roll-out to neighboring states by geographic proximity
Staggered roll-out in North East

- NOW Account Experiment starts in MA and NH in 1974.I

Drechsler, Savov, and Schnabl (2020)
Staggered roll-out in North East

- Expands to rest of New England in 1976.1
Staggered roll-out in North East

- Expands to New York in 1978.I

Drechsler, Savov, and Schnabl (2020)
Staggered roll-out in North East

- Expands to New Jersey in 1979.I

Drechsler, Savov, and Schnabl (2020)
Staggered roll-out in North East

- Expands to all of U.S. in 1980.IV
Empirical strategy: NOW Account Experiment

1. A partial repeal of Reg Q

2. Exploit staggered roll-out for identification:

\[ \text{Inflation}_{it} = \alpha_i + \gamma_t + \beta \text{Deregulated}_{it} + \varepsilon_{it} \]

\( \text{Deregulated}_{it} \) = Indicator variable if MSA\(_{it} \) allows NOW accounts

3. Identification assumption: Roll-out driven by geographic proximity, not local inflation or economic activity

Drechsler, Savov, and Schnabl (2020)
Results: NOW Account Experiment

\[ \text{Inflation}_{it} = \alpha_i + \gamma_t + \beta_t \text{Deregulated}_{it} + \varepsilon_{it} \]

1. Introduction of NOW Accounts lowers inflation rate
   - effect is largest in earlier states, where NOW account penetration was highest

*Drechsler, Savov, and Schnabl (2020)*
Results: NOW Account Experiment

\[ \text{Inflation}_{it} = \alpha_i + \gamma_t + \beta \text{Deregulated}_{it} + \varepsilon_{it} \]

<table>
<thead>
<tr>
<th></th>
<th>Inflation</th>
<th>Wage inflation (all)</th>
<th>Wage inflation (manuf.)</th>
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<tbody>
<tr>
<td>(1)</td>
<td>(2)</td>
<td>(3)</td>
<td>(4)</td>
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<tr>
<td>Deregulated</td>
<td>-1.203***</td>
<td>-1.228***</td>
<td>-1.400***</td>
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<td></td>
<td>(0.426)</td>
<td>(0.406)</td>
<td>(0.358)</td>
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<tr>
<td>Empl. growth</td>
<td>0.173***</td>
<td></td>
<td>0.407***</td>
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<td></td>
<td>(0.035)</td>
<td></td>
<td>(0.041)</td>
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</tbody>
</table>

Time FE: Yes | Yes | Yes | Yes | Yes | Yes | Yes
MSA FE: Yes | Yes | Yes | Yes | Yes | Yes | Yes

Obs. 1,300 | 1,300 | 10,021 | 10,021 | 6,833 | 6,833
MSAs 25 | 25 | 315 | 315 | 173 | 173
\(R^2\) 0.903 | 0.910 | 0.603 | 0.665 | 0.502 | 0.511

⇒ Introduction of NOW Accounts lowers inflation rate by \(\sim 1.2\%\)
- Robust to controlling for economic activity (employment growth)
The Repeal of Reg Q (the end of the Great Inflation)

1. Congress effectively repealed Reg Q by introducing two deregulated small-time deposits (CDs): MMCs and SSCs in 1978.III and 1979.III

⇒ Examine impact of local take-up of deregulated deposits on inflation

2. Identification challenge: take-up may be responding to local economic conditions

⇒ Instrument take-up with 1975 share of small time deposits:
   - checking, savings and time deposits differ in their maturity and liquidity (imperfect substitutes)
   - take-up should be larger in areas that had more small-time deposits in the past
   - 1975 economic conditions were very different than in 1978 (trough vs. peak of inflation cycle)
### OLS: inflation

\[ \text{Inflation}_{it} = \alpha_i + \delta_t + \beta \text{MMC Share}_{it} + \varepsilon_{it} \]

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<tbody>
<tr>
<td>MMC share</td>
<td>-0.240***</td>
<td>-0.273***</td>
<td>-0.259***</td>
<td>-0.268***</td>
</tr>
<tr>
<td></td>
<td>(0.064)</td>
<td>(0.067)</td>
<td>(0.076)</td>
<td>(0.078)</td>
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<td>Inflation, pre-period</td>
<td>0.200</td>
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<td></td>
<td>(0.140)</td>
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<tr>
<td>Employment growth</td>
<td></td>
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<td>-0.068</td>
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<td>(0.110)</td>
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<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>MSA FE</td>
<td>No</td>
<td>No</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Obs.</td>
<td>300</td>
<td>300</td>
<td>300</td>
<td>300</td>
</tr>
<tr>
<td>(R^2)</td>
<td>0.577</td>
<td>0.588</td>
<td>0.835</td>
<td>0.836</td>
</tr>
</tbody>
</table>

1. Large, very significant relation between MMC take-up and inflation
   - robust to controlling for pre-period inflation and employment growth
   - coefficient magnitude can explain full drop in aggregate inflation

*Drechsler, Savov, and Schnabl (2020)*
IV: first stage

1. Binscatter plot, 316 MSAs

MMC take-up vs. 1975 small-time deposit share

2. Large variation in small-time deposit share and in MMC take-up
   ⇒ 1975 small-time share strongly predicts MMC take-up
### IV: inflation

\[
\text{Inflation}_{it} = \alpha + \delta_t + \beta \hat{\text{MMC Share}}_{it} + \varepsilon_{it}
\]

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<th>(1)</th>
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</thead>
<tbody>
<tr>
<td>MMC share</td>
<td>$-0.243^{***}$</td>
<td>$-0.312^{***}$</td>
<td>$-0.286^{***}$</td>
<td>$-0.354^{***}$</td>
</tr>
<tr>
<td></td>
<td>(0.086)</td>
<td>(0.095)</td>
<td>(0.100)</td>
<td>(0.108)</td>
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<tr>
<td>Past inflation</td>
<td>0.227</td>
<td></td>
<td></td>
<td>0.215</td>
</tr>
<tr>
<td></td>
<td>(0.148)</td>
<td></td>
<td></td>
<td>(0.147)</td>
</tr>
<tr>
<td>Empl. growth</td>
<td></td>
<td>$-0.174$</td>
<td>$-0.183$</td>
<td></td>
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<tr>
<td></td>
<td></td>
<td>(0.159)</td>
<td>(0.158)</td>
<td></td>
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<tr>
<td>Time FE</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Obs.</td>
<td>300</td>
<td>300</td>
<td>300</td>
<td>300</td>
</tr>
<tr>
<td>Weak IV $p$-val</td>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
</tr>
</tbody>
</table>

1. IV coefficients are very similar to OLS
   - robust, economically large, and highly significant
   - coefficient magnitude can explain full drop in aggregate inflation
**IV: wage inflation**

\[
\text{Wage inflation}_{it} = \alpha_i + \delta_t + \beta \text{MMC Share}_{it} + \varepsilon_{it}
\]

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<thead>
<tr>
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<th>(1)</th>
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<th>(3)</th>
<th>(4)</th>
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</thead>
<tbody>
<tr>
<td><strong>MMC Share</strong></td>
<td>-0.159***</td>
<td>-0.157***</td>
<td>-0.144***</td>
<td>-0.143***</td>
</tr>
<tr>
<td></td>
<td>(0.026)</td>
<td>(0.027)</td>
<td>(0.026)</td>
<td>(0.028)</td>
</tr>
<tr>
<td><strong>Past wage infl.</strong></td>
<td>-0.015</td>
<td></td>
<td>-0.008</td>
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<tr>
<td></td>
<td>(0.048)</td>
<td></td>
<td>(0.045)</td>
<td></td>
</tr>
<tr>
<td><strong>Empl. growth</strong></td>
<td></td>
<td>0.137**</td>
<td>0.138**</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>(0.057)</td>
<td>(0.057)</td>
<td></td>
</tr>
<tr>
<td><strong>Time FE</strong></td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td><strong>Obs.</strong></td>
<td>3,615</td>
<td>3,555</td>
<td>3,615</td>
<td>3,555</td>
</tr>
<tr>
<td><strong>Weak IV p-val</strong></td>
<td>0.009</td>
<td>0.005</td>
<td>0.004</td>
<td>0.002</td>
</tr>
</tbody>
</table>

1. Large, highly significant impact of MMC take-up on wage inflation
   - 100% increase in MMC take-up → reduces wage inflation by 16%
   - can explain the aggregate decline in wage inflation

*Drechsler, Savov, and Schnabl (2020)*
Inflation: timing

$$\Delta \text{Inflation}_{i,78.III \rightarrow t} = \alpha_t + \beta_t \text{MMC Share}_{i,1981.III} + \epsilon_{i,t}$$

1. Cross-sectional effect of take-up occurs right at time of deregulation
   - leads aggregate by 3 quarters → inflation declined earlier in high take-up areas; followed soon by rest of US

Drechsler, Savov, and Schnabl (2020)
Takeaways

1. Propose and test a new explanation for the Great Inflation
   - due to Reg Q, which disabled monetary policy transmission

2. The Great Inflation was the result of a serious financial friction, not the Fed’s policy rule
   - once the friction was removed, inflation returned to low levels (as in most of history)
   - explains the “stagflation,” which was unexplained

⇒ Low inflation post-1982 may not be due to aggressive monetary policy as conventionally believed
   - explains why inflation has not been “just around the corner” (e.g., 2015)

⇒ Reconciles eras: Great Inflation and post-2008 low inflation
   - Reg Q: deposit-rate ceiling → high inflation
   - ZLB: deposit-rate floor → low inflation
Appendix
Spot the Anomaly

Yield on 10-Year U.S. Government Bond

Source: Homer and Sylla (2005), Global Financial Data

1. Inflation was low before and after the Great Inflation

2. The Great Inflation is a historical anomaly

Drechsler, Savov, and Schnabl (2020)
S&Ls and deposit passthrough

1. Average deposit rates of banks and S&Ls:

2. S&Ls had even lower passthrough than banks during Reg Q period
   - by regulation they had longer-duration assets (mortgages) → issued more long-term time deposits
   - after Reg Q was repealed (MMC line) passthroughs equalized

⇒ Inflation should be less responsive to Fed funds rate changes in S&L-dominated areas
   - difference should disappear after Reg Q was lifted

Drechsler, Savov, and Schnabl (2020)
First stage: S&Ls and local deposit passthrough

<table>
<thead>
<tr>
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<th>Average deposit rate</th>
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<tbody>
<tr>
<td></td>
<td>(1)</td>
</tr>
<tr>
<td>S&amp;L share × Fed funds</td>
<td>−0.301*** (0.045)</td>
</tr>
<tr>
<td></td>
<td>(2)</td>
</tr>
<tr>
<td>S&amp;L share</td>
<td>0.019*** (0.005)</td>
</tr>
<tr>
<td>Empl. growth</td>
<td>0.000 (0.007)</td>
</tr>
<tr>
<td>Inflation, lag</td>
<td>−0.010 (0.019)</td>
</tr>
<tr>
<td>Obs.</td>
<td>1,079</td>
</tr>
<tr>
<td>$R^2$</td>
<td>0.890</td>
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<tr>
<td></td>
<td>(3)</td>
</tr>
<tr>
<td>S&amp;L share × Fed funds</td>
<td>−0.296*** (0.034)</td>
</tr>
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<td></td>
<td>(4)</td>
</tr>
<tr>
<td>S&amp;L share</td>
<td>0.015*** (0.004)</td>
</tr>
<tr>
<td>Empl. growth</td>
<td>0.005 (0.008)</td>
</tr>
<tr>
<td>Inflation, lag</td>
<td>−0.020 (0.016)</td>
</tr>
<tr>
<td>Obs.</td>
<td>904</td>
</tr>
<tr>
<td>$R^2$</td>
<td>0.879</td>
</tr>
</tbody>
</table>

1. S&Ls had $\sim 0.3$ lower passthrough than banks
   $\Rightarrow$ use S&L share $\times$ Fed funds rate to instrument for deposit rate

Drechsler, Savov, and Schnabl (2020)
### Reduced form: S&Ls and local deposit passthrough

<table>
<thead>
<tr>
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<th>Inflation</th>
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<tbody>
<tr>
<td></td>
<td>(1)</td>
</tr>
<tr>
<td>S&amp;L share × Fed funds</td>
<td>0.452***</td>
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<tr>
<td></td>
<td>(0.171)</td>
</tr>
<tr>
<td>S&amp;L share</td>
<td>0.036*</td>
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<td></td>
<td>(0.021)</td>
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<tr>
<td>Empl. growth</td>
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<tr>
<td>Inflation, lag</td>
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<tr>
<td>Time FE</td>
<td>Yes</td>
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<tr>
<td>MSA FE</td>
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<tr>
<td>Obs.</td>
<td>1,079</td>
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<tr>
<td>$R^2$</td>
<td>0.066</td>
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</tbody>
</table>

1. When Fed tightens by 1%, inflation is $\sim 0.5\%$ higher in areas with S&L share of 1 vs. 0
   - robust to controlling for employment growth, lagged inflation

*Source: Drechsler, Savov, and Schnabl (2020)*
## IV: S&Ls and local deposit passthrough

<table>
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<tr>
<th></th>
<th>Inflation</th>
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<tr>
<td><strong>Deposit rate</strong></td>
<td></td>
<td>−1.503**</td>
<td>−1.779***</td>
<td>−1.357**</td>
<td>−1.637***</td>
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<tr>
<td></td>
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<td>(0.619)</td>
<td>(0.590)</td>
<td>(0.642)</td>
<td>(0.631)</td>
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<tr>
<td><strong>S&amp;L share</strong></td>
<td></td>
<td>0.064***</td>
<td>0.060***</td>
<td>0.008**</td>
<td>0.010**</td>
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<td>(0.018)</td>
<td>(0.019)</td>
<td>(0.004)</td>
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<td><strong>Empl. growth</strong></td>
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<td>0.179***</td>
<td></td>
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<td>0.153***</td>
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<td></td>
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<td>(0.038)</td>
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<td>(0.028)</td>
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<td><strong>Inflation, lag</strong></td>
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<td></td>
<td>0.181***</td>
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<td>0.094</td>
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<td></td>
<td>(0.063)</td>
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<td>(0.064)</td>
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<td><strong>Time FE</strong></td>
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</tr>
<tr>
<td><strong>MSA FE</strong></td>
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<td>Yes</td>
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<td>No</td>
<td>Yes</td>
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<tr>
<td><strong>Obs.</strong></td>
<td>1,079</td>
<td>904</td>
<td>1,075</td>
<td>900</td>
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<tr>
<td><strong>Weak IV F-stat</strong></td>
<td>45</td>
<td>74</td>
<td>26</td>
<td>40</td>
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<tr>
<td><strong>p-val</strong></td>
<td>0.000</td>
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</tbody>
</table>

1. 1% increase in deposit rate lowers inflation by $\sim 1.6\%$
   - can account for Great Inflation: $1.6 \times 6\% = 9.6\%$ increase in inflation
S&Ls and local deposit passthrough

\[ \Delta \text{Inflation}_{i,t} = \alpha_t + \beta_t \left( \text{S&L share} \right)_{i,t} + \epsilon_{i,t} \]

1. Inflation responds less to Fed tightening in S&L-denominated MSAs
2. Relationship disappears after Reg Q is repealed (MMC line)

Drechsler, Savov, and Schnabl (2020)
Consumption growth is highly correlated with the real deposit rate (74% correlation)

⇒ Euler equation holds using actual rate households get (implied EIS ~ 1)
- does not hold for real Fed funds rate
Median household asset allocation

1. Data from first Survey of Consumer Finances (1983):
   - 94% of 5th decile households had deposits vs 15% stocks, 4% MMF

2. Median household had 28% of total assets in deposits

3. 76% of liquid assets → important for marginal savings

*Drechsler, Savov, and Schnabl (2020)*