• Conventional monetary policy
  – Control short-term interest rate on interbank loans to influence output and inflation

• Unconventional monetary policy:
  – Emergency lending (today)
  – Large-scale asset purchases and forward guidance (next week)
  – Negative interest rates (week 7)
Fed funds, Baa, and 10-year Treasury rates, Jan 2006 to Sep 2016

Fed assets, 2007- Dec 08

Dec 31, 2008:

- TAC $450 B
- swaps $554 B
- CPLF $334 B

Total assets: $2,276 B
• Commercial paper lending facility: Fed purchased asset-backed commercial paper directly

• Barcan Duygan-Bump, et al., How effective were the Federal Reserve emergency liquidity facilities?, Journal of Finance, April 2013

• Money market mutual funds
  – Accept deposits from customers
  – Invest in Treasury securities or prime commercial paper
• Reserve Primary Fund
  – Historically had been very conservative
  – Later took more risks to offer higher yield (e.g. loans to Lehman
  – Lehman bankrupt Sept 15, 2008
  – Reserve Primary Fund “broke the buck” Sept 16

Total assets under management, prime and government-only money market mutual funds, September-October 2008
Commercial Paper Lending Facility

Fed announced Sept 19 it would lend to banks that purchased asset-backed commercial paper (ABCP) from eligible money market mutual funds (MMMF), accepting the ABCP as collateral for loans.
Event study methodology

• Time series: do we see a change on the day of the announcement?
• Cross-section: is change bigger for those MMMF with more ABCP exposure?
We first look at how asset flows responded to the announcement of the AMLF. Using a panel of daily observations encompassing one week before and one week after the announcement of the AMLF (September 12-26, 2008), we estimate the following equation:

\[ \Delta A_t = \beta_0 + \beta_1 AMLF_t + \beta_2 S_t^{ABCP} + \beta_3 AMF_L_t + \beta_4 S_t^{Liq} + \beta_5 Inst_t + \epsilon_t \quad (3) \]

where \( \Delta A_t \) is the change in total AUM of fund \( t \) between \( t-1 \) and \( t \), \( AMLF_t \) is an indicator variable that equals 1 after September 19, 2008 (we denote the announcement date of the AMLF by \( t \)), \( S_t^{ABCP} \) is the share of ABCP holdings in fund \( t \)'s portfolio on September 9, 2008 (one week before Lehman's bankruptcy, which we denote by \( \tilde{t} \)), \( S_t^{Liq} \) is the share of “liquid” assets defined as repos, Treasuries, and other U.S. agency notes of fund \( t \) at time \( t \), \( Inst_t \) is a dummy variable for institutional MMNFs; and \( Liq_t \) is the 7-day liquidity of the fund, defined as the percent of assets in fund \( t \)'s portfolio that are scheduled to reach maturity within 7 days from \( t \). We also estimate equation (3) including fund and time (day) fixed effects.

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### Assets under management of vulnerable MMF increased

Table 10: Impact of the Asset-Backed Commercial Paper Money Market Mutual Fund Liquidity Facility (AMLF) on money market mutual fund asset flows

<table>
<thead>
<tr>
<th>Dependent variable: Percentage change in assets under management</th>
<th>(1)</th>
<th>(2)</th>
<th>(3)</th>
<th>(4)</th>
<th>(5)</th>
<th>(6)</th>
<th>(7)</th>
<th>(8)</th>
</tr>
</thead>
<tbody>
<tr>
<td>AMLF Program Indicators</td>
<td>0.002</td>
<td>0.002**</td>
<td>0.002</td>
<td>0.002</td>
<td>0.002</td>
<td>0.002</td>
<td>0.002</td>
<td>0.002**</td>
</tr>
<tr>
<td>AMLF Program Indicators X Fraction of ABCP (on 16 September 2008)</td>
<td>[0.001]</td>
<td>[0.001]</td>
<td>[0.001]</td>
<td>[0.001]</td>
<td>[0.001]</td>
<td>[0.001]</td>
<td>[0.001]</td>
<td>[0.001]</td>
</tr>
<tr>
<td>Fraction of ABCP (on 16 September 2008)</td>
<td>0.000***</td>
<td>0.000***</td>
<td>0.000***</td>
<td>0.000***</td>
<td>0.000***</td>
<td>0.000***</td>
<td>0.000***</td>
<td>0.000***</td>
</tr>
<tr>
<td>Fraction of ABCP (on 16 September 2008)</td>
<td>0.000***</td>
<td>0.000***</td>
<td>0.000***</td>
<td>0.000***</td>
<td>0.000***</td>
<td>0.000***</td>
<td>0.000***</td>
<td>0.000***</td>
</tr>
<tr>
<td>Fraction of Liquid Assets (on 16 September 2008)</td>
<td>0.000***</td>
<td>0.000***</td>
<td>0.000***</td>
<td>0.000***</td>
<td>0.000***</td>
<td>0.000***</td>
<td>0.000***</td>
<td>0.000***</td>
</tr>
<tr>
<td>Institutional Fund Indicators</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Day Fixed Effects</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td>Yes</td>
<td>No</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Week Fixed Effects</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td>No</td>
</tr>
<tr>
<td>Observations</td>
<td>7,644</td>
<td>7,644</td>
<td>7,644</td>
<td>7,644</td>
<td>7,644</td>
<td>7,644</td>
<td>7,644</td>
<td>7,644</td>
</tr>
</tbody>
</table>

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14
CPLF reduced ABCP yield spread

Table 11: Impact of the Asset-Backed Commercial Paper Money Market Mutual Fund Liquidity Facility (AMLF) on asset-backed commercial paper (ABCP) yields

<table>
<thead>
<tr>
<th>Independent variable</th>
<th>(1)</th>
<th>(2)</th>
<th>(3)</th>
<th>(4)</th>
<th>(5)</th>
<th>(6)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Post-AMLF Indicator</td>
<td>-0.787***</td>
<td>0.779**</td>
<td>0.987***</td>
<td>-0.801***</td>
<td>-0.336</td>
<td>[0.318]</td>
</tr>
<tr>
<td>Sponsor CDS Spread</td>
<td>0.122</td>
<td>0.259**</td>
<td>0.039</td>
<td>0.233</td>
<td>-0.268</td>
<td>[0.072]</td>
</tr>
<tr>
<td>AMLF Participant Indicator</td>
<td>-0.842</td>
<td>-0.899</td>
<td>-0.675***</td>
<td>0.665***</td>
<td>-0.871**</td>
<td>[0.383]</td>
</tr>
<tr>
<td>Post-AMLF Indicator X AMLF Participant Indicator</td>
<td>2.752***</td>
<td>2.457***</td>
<td>1.522***</td>
<td>2.807***</td>
<td>2.390***</td>
<td>[0.151]</td>
</tr>
<tr>
<td>Constant</td>
<td>0.153</td>
<td>0.723</td>
<td>0.304</td>
<td>0.438</td>
<td>0.548</td>
<td>0.642</td>
</tr>
</tbody>
</table>

Baa continued to rise through Oct 31, 2008
• The Fed began scaling down emergency lending in January 2009 and today these programs are essentially all shut down.
• Fed ended up making a profit on these loans.
• Widespread financial failures did not happen.