GOVERNMENT DEBT MANAGEMENT
AT THE ZERO LOWER BOUND

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LAWRENCE H. SUMMERS
OUR PAPER

I. Quantify Fed vs. Treasury conflict in QE era

II. Fed vs. Treasury in historical perspective

III. A modern framework for debt management
   • Will develop and extend logic from Greenwood, Hanson, Stein (2015)
   • Logic applied to consolidated government balance sheet

IV. Ways to resolve Fed vs. Treasury conflict
10-YEAR EQUIVALENTS

• QE
  • QE = SOMA – 0.95*Currency
  • QE x Duration / Duration(10-yr) = QE (10-year equivalents)

• Treasury Maturity Extension

\[
\Delta \left( \frac{Debt_t \cdot Dur_t}{Dur_t^{10-yr}} \right) = \left( \frac{1}{Dur_t^{10-yr}} \right) \cdot \left( \frac{\Delta Debt_t Dur_{t-1}}{\text{Debt Expansion}} + \frac{\Delta Dur_t Debt_t}{\text{Maturity Extension}} \right)
\]
## 10-Year Equivalents (Table 2)

### Panel A: Impact of Quantitative Easing

<table>
<thead>
<tr>
<th></th>
<th>Fed Holdings</th>
<th>10-Year Equivalents</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>SOMA ($bn)</td>
<td>Currency x 0.95</td>
</tr>
<tr>
<td>12/2007</td>
<td>750</td>
<td>784</td>
</tr>
<tr>
<td>12/2008</td>
<td>490</td>
<td>844</td>
</tr>
<tr>
<td>12/2009</td>
<td>1,839</td>
<td>883</td>
</tr>
<tr>
<td>12/2010</td>
<td>2,150</td>
<td>934</td>
</tr>
<tr>
<td>12/2011</td>
<td>2,604</td>
<td>1,020</td>
</tr>
<tr>
<td>12/2012</td>
<td>2,649</td>
<td>1,105</td>
</tr>
<tr>
<td>12/2013</td>
<td>3,743</td>
<td>1,178</td>
</tr>
<tr>
<td>7/2014</td>
<td>4,121</td>
<td>1,220</td>
</tr>
</tbody>
</table>

### Panel B: Impact of Expansion of Debt and Treasury Maturity Extension

<table>
<thead>
<tr>
<th></th>
<th>Debt Outstanding</th>
<th>10-Year Equivalents</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Debt Outstanding</td>
<td>10-Year Equivalents</td>
</tr>
<tr>
<td></td>
<td>SOMA ($bn)</td>
<td>Currency x 0.95</td>
</tr>
<tr>
<td>12/2007</td>
<td>4,537</td>
<td>3.9</td>
</tr>
<tr>
<td>12/2008</td>
<td>5,798</td>
<td>3.5</td>
</tr>
<tr>
<td>12/2009</td>
<td>7,272</td>
<td>3.9</td>
</tr>
<tr>
<td>12/2010</td>
<td>8,863</td>
<td>4.1</td>
</tr>
<tr>
<td>12/2011</td>
<td>9,937</td>
<td>4.3</td>
</tr>
<tr>
<td>12/2012</td>
<td>11,053</td>
<td>4.5</td>
</tr>
<tr>
<td>12/2013</td>
<td>11,869</td>
<td>4.5</td>
</tr>
<tr>
<td>7/2014</td>
<td>12,163</td>
<td>4.6</td>
</tr>
</tbody>
</table>
The Fed’s Quantitative Easing (QE) policies have reduced the net supply of long-term securities.
Meanwhile the Treasury was doing the opposite, extending the average maturity of its borrowings.
PULLING IN OPPOSITE DIRECTIONS

10-year duration equivalents, Change since Dec. 31, 2007 (% of GDP)

Treasury: Maturity Extension

Fed QE: Treasuries, Agencies and MBS

Net Impact: 10.1%
PULLING IN OPPOSITE DIRECTIONS

10-year duration equivalents, Change since Dec. 31, 2007 (% of GDP)

Fed QE
Maturity Extension
Treasury: Rising Debt Stock

10-year equivalents, % of GDP

2008 2009 2010 2011 2012 2013 2014

24.9%
5.5%
15.6%
Other countries

• We have done this analysis for the UK and Japan (and attempted for the Eurozone!)
  • Similar issues in Japan
  • In UK, agreement between BoE and Exchequer mitigates this effect
MARKET IMPACT

Relying on prior studies, we estimate that the Fed’s QE policies have lowered the yield on 10-year Treasuries by a cumulative 1.37 percentage points.

Thus, Treasury’s *maturity extension* may have offset as much as one-third of QE’s market impact.
Before 2008, the Fed’s balance sheet was far smaller. As a result, the Fed had little impact on the maturity structure of the government’s consolidated debts.
# INTERNATIONAL PRECEDENTS FOR COOPERATION

<table>
<thead>
<tr>
<th>Country</th>
<th>Pre-2008 Debt Management Arrangement</th>
<th>QE Era</th>
<th>Average Maturity in 2014</th>
</tr>
</thead>
<tbody>
<tr>
<td>United States</td>
<td>There are no formal institutional arrangements to coordinate with monetary policy. Treasury has full authority over U.S. debt management. The Fed tends to mimic Treasury issuance patterns and only target short rates (with some exceptions, such as WWII and 1961 Operation Twist).</td>
<td>Treasury extended its debt maturity to reduce rollover risk and catch up with other countries. The side effect was to counteract a portion of Fed’s QE effects. It is not clear which agency controls the U.S. government maturity policy.</td>
<td>5.7 years</td>
</tr>
<tr>
<td>Canada</td>
<td>Debt management resides in the Ministry of Finance. The Canadian Finance Department formally consults with the Bank of Canada on debt management decisions and issuance schedules are announced on the Bank of Canada’s website. In policy reports, there is discussion of the shared responsibilities and joint efforts of the Ministry and the Bank.</td>
<td>In the decade before the crisis, Canada’s average maturity moved very slowly within a range of 6.0 years to 7.0 years. During the crisis, however, average maturity fell from 7.0 years in 2007 to 6.0 years in 2009, as bills were used to fund both fiscal deficits and the government’s MBS purchase program. In 2012 the government announced that it would reallocate issuance towards long-term bonds to reduce refinancing risk.</td>
<td>6.0 years</td>
</tr>
<tr>
<td>France</td>
<td>There are no institutional arrangements to coordinate with monetary policy. In 2000, the Agence France Trésor was created within the Finance Ministry to manage the debt. The idea of an independent office was rejected on</td>
<td>Maturity of French debt is currently at approximately the same level as it was in 2006 and 2007.</td>
<td>7.0 years</td>
</tr>
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<tr>
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<tr>
<td>Italy</td>
<td>The Italian Treasury has the authority over debt management. However, the Bank of Italy advises the Treasury on debt management. In its advisory capacity, the Bank of Italy takes into account monetary conditions.</td>
<td>The average maturity of Italian government bonds has decreased by nearly 1 year since 2009. However, this may be more due to sovereign credit pressures than an attempt to ease monetary conditions. In 2014, the Italian Treasury has been trying to issue longer-term.</td>
<td>6.3 years</td>
</tr>
<tr>
<td>United Kingdom</td>
<td>In 1997, when the government gave the Bank of England independent control over interest rates, debt management policy was also taken out of the Bank of England to avoid any perceived conflicts with monetary policy. Debt management was assigned to the newly established Debt Management Office (DMO), an executive agency of Treasury. However, the DMO must “ensure that debt management is consistent with the aims of monetary policy.”</td>
<td>As the Bank of England began its quantitative easing program in early 2009, the Governor of the Bank of England sent a public letter to the Chancellor of the Exchequer that in order to ensure consistency between debt management and monetary policy the government should not alter its issuance strategy in response to QE. The directive was accepted by the Chancellor.</td>
<td>14.9 years</td>
</tr>
<tr>
<td>Japan</td>
<td>An office within the Ministry of Finance determines which maturities to issue, with a goal of ensuring smooth and cost-effective issuance. The central bank acts as fiscal agent but the Ministry announces all issuance plans and auction results. There is no special committee or working group to ensure coordination between debt management and monetary policy, despite both being actively involved in bond markets.</td>
<td>Bank of Japan has been engaged in a large quantitative easing program since 2010. Debt management since 2009 has been aggressively extending maturity to reduce rollover risk associated with large debt levels. The conflicting tactics of monetary policy and debt management are similar to the U.S., except that in Japan, rollover risk may loom larger than refinancing risk.</td>
<td>7.7 years</td>
</tr>
</tbody>
</table>
Traditional Debt Management

Treasury’s traditional approach to determining the appropriate maturity of the debt traded off a desire to achieve low cost financing against the desire to limit fiscal risk.
Elements of Model

• Analytical framework from Greenwood, Hanson, Stein (2015)
• Government: Raises taxes and issues debt to finance a one-time expenditure (or an accumulated deficit)
  • Standard tax-smoothing motive due to convex distortionary costs
  • New twist: Households derive greater monetary / liquidity services from short-term debt
• Absent money demand, govt. opts for longer-term debt
  • Eliminates refinancing risk (i.e., govt. needs to raise taxes when short rates rise) which enables govt. to perfectly smooth taxes
• With money demand, optimally tilts towards short-term debt and incurs some refinancing risk
  • Central trade-off: Govt. tries to satisfy money demand for short-term debt, but is limited by tax-smoothing costs of uncertain refinancing
• Trade-offs appear to be reflected in U.S. government maturity choices over time
Issuing short-term is “cheaper” because it allows Treasury to capture the “liquidity premium” on T-bills and to conserve on the “term premium” investors demand to hold long bonds.

Liquidity premium on short-term T-bills, Basis points
TRADITIONAL DEBT MANAGEMENT

Term Premium on 10-Year Zero-Coupon Treasuries (1990 to 2014)
TRADITIONAL DEBT MANAGEMENT

What is fiscal risk?

• Refinancing risk
  • If the government issues short-term, it is exposed to increases in interest rates
  • If the government issues long-term, it ‘locks in’ the cost of capital

• Rollover risk
  • Failed auction
  • Self-fulfilling bank run
The desire to **limit fiscal risk** looms larger when the overall debt burden rises.
IMPLICATIONS

Thus, Treasury has historically tended to extend the average maturity of the debt when debt-to-GDP rises. Much like the Treasury is doing today.
How big is fiscal risk empirically?
We argue that the “fiscal risk” generated by issuing short-term debt is less important than traditionally thought.
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FISCAL RISK

• Driven by changes in short term interest rates
• But, in practice, rates are high when there are primary surpluses: both rates and surpluses are driven in part by the business cycle
• Theoretically, the effective weight the social planner places on fiscal risks depends on the covariance between primary surpluses and changes in short-term rates
TRADITIONAL DEBT MANAGEMENT

- Shorter-term: Low cost financing
- Longer-term: Limit fiscal risk
MODERN DEBT MANAGEMENT

Modern debt management recognizes that the maturity of government debt may also be a valuable tool for managing aggregate demand and promoting financial stability.
Financial Stability

- **Private-sector banks** who can also engage in money-creation
- **Banks want to issue short-term, safe debt because it is cheap**
  - Caballero & Krishnamurthy ‘08: Responding to a global shortage, US financial sector tried to manufacture “riskless” assets pre-crisis
  - Gorton ‘10, Gorton & Metrick ‘09: Money creation by unregulated shadow banking system
- **Banking sector response to cheapness may be socially excessive**
  - Stein ‘12: Excessive private money creation makes the system too vulnerable to crises
  - Short-term debt leads to costly fire sales in bad states, since banks must liquidate assets to repay
  - Private banks issue too much short-term debt because they do not fully internalize these fire-sale costs
Objectives of modern debt management have been assigned to Treasury and Fed, which exercise different policy weights.
Other Considerations

• Inflation protected securities

• Liquid Benchmark Curve
  • Treasury places value on having a liquid “benchmark” curve for market participants
DEBT MANAGEMENT CONFLICTS

• Expansionary monetary policy at ZLB
  • Extend average duration to mitigate fiscal risk (Treasury)
  • Shorten average duration to bolster aggregate demand (Fed)
  • Fed and Treasury in direct conflict over objectives

• Contractionary monetary policy
  • Rise in premium on money-like assets
  • Increases incentive to issue short
    • In this case, Treasury-led debt management is expansionary
SOLVING THE CONFLICTS

- Outside of the zero-lower-bound, Fed sterilization of Treasury debt management is imperfect workaround
  - Fed gets last word using short rate
  - But sterilization no longer possible at the ZLB

- **Better solution**: Treasury and Fed release annual joint statement on combined public debt management strategy
  - Forces each agency to internalize other’s objectives
  - Fed charged with routine tactical adjustments because of its expertise in open-market operations
ADDITIONAL THOUGHTS

• In an era of low real and nominal interest rates, cooperation between fiscal and monetary authorities becomes more important
• Even outside of the issues we have presented here, working model of a fully independent central bank is going to come into question