The Future of Central Banking
Andrew G Haldane

Macro Financial Modelling Group Winter Meeting
Friday 13 March 2015
Extraordinary Times

US
Real GDP (Index: 2004 = 100)

90 95 100 105 110 115 120 125 130 135

8%

Euro area
Real GDP (Index: 2004 = 100)

90 95 100 105 110 115 120 125 130 135

12%

UK
Real GDP (Index: 2004 = 100)

90 95 100 105 110 115 120 125 130 135

12%

Source: Thomson Reuters
Simple linear trend used for pre-crisis trends
Secular Stagnation?

Indices: 2008Q1=100

- UK
- US
- Germany
- France
- Netherlands
A Short History of UK Productivity

A Long History of UK Productivity

Source: Hills, Thomas and Dimsdale (2015) "Three Centuries of Data - Version 2.1", available here. Illustrative estimates prior to 1850 are based on data on the growth rate of technology between 1AD and 1750AD in "A farewell to Alms" by Gregory Clark.
Extraordinary Measures

Short-term policy rates

Source: Global Financial Database
Extraordinary Measures

The Bank of England Balance Sheet and Bank Rate 1700-2014

Extraordinary Measures

- BoE
- Federal Reserve
- ECB
- Bank of Japan

Percentage of GDP

Year:
- 1961
- 1966
- 1971
- 1976
- 1981
- 1986
- 1991
- 1996
- 2001
- 2006
- 2011
- 2016
Extraordinary Measures

Long-term rates

Source: Global Financial Database. Notes: (a) UK interest rate is the yield on a 2.5% coupon Consol, (b) US interest rate is the constant maturity yield on a 10-year US Treasury bond, (c) German interest rate is the yield on a 10-year German government bond, (d) Japanese interest rate is the yield on a 10-year Japanese government bond.
Extraordinary Measures

Short and long-term interest rates, 3000 BC to present

**Extraordinary Measures**

**Evolution of 10 year yields**

![Graph showing the evolution of 10 year yields](image)

**Government bond yields**

<table>
<thead>
<tr>
<th>Country</th>
<th>Positive</th>
<th>Negative</th>
</tr>
</thead>
<tbody>
<tr>
<td>Switzerland</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Germany</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Finland</td>
<td></td>
<td></td>
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<tr>
<td>Netherlands</td>
<td></td>
<td></td>
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<tr>
<td>Denmark</td>
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<tr>
<td>Austria</td>
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<tr>
<td>Belgium</td>
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<tr>
<td>France</td>
<td></td>
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<tr>
<td>Sweden</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Spain</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Italy</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Norway</td>
<td></td>
<td></td>
</tr>
<tr>
<td>UK</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Source: Bloomberg and Bank calculations. Data to close 10 March 2015.

Notes: *Global equates to 70% world PPP GDP; inflation targets fixed using latest targets and PPP weighted according to share over time. Countries are grouped using 10 year yields averaged over the month.*
A Brief History of Central Banks

• As provider of “base money” – banker to the public
• As provider of the “settlement assets” – banker to the banks
• As “lender of last resort” – Bagehot’s Doctrine
• As “supervisor of banks” – the long road to independence
• As controller of “price/quantity of money” – monetary policy
• As regulator of “price/quantity of credit” – macroprudential policy
The Future of Central Banks

- The future of *money/payments*
- The future of *micro-prudential regulation*
- The future of *monetary policy*
- The future of *macro-prudential regulation*
- From *national* to *international*?
From Goldcoin to Bitcoin?

The Price of Bitcoin

From Inflation-Targeting to…?

Global Inflation

Global PPP-weighted deviation of CPI inflation to target*

Short term policy rates

- Higher than 5%
- Between 3% and 5%
- Between 1% and 3%
- Between 0% and 1%

Proportion of regions*

*Global equates to 70% world PPP GDP; inflation targets fixed using latest targets and PPP weighted according to share over time
From Unipolar to Multi-Polar Regulation?

Basel I (1988)
30 pages

347 pages

Basel III (2010)
616 pages

Progress on the Global Reform Agenda

- BASEL III – CAPITAL
- BASEL III – LIQUIDITY
- LEVERAGE
- STRUCTURAL REFORMS
- SYSTEMIC SURCHARGES
- SHADOW BANKING
- OTC DERIVATIVES
- RESOLUTION REGIMES
- RESOLVABILITY
- TRANSPARENCY

NO PROGRESS  FULL IMPLEMENTATION
Behavioural Impact?

**Leverage Ratios and Risk-taking**

- Tier 1 / Assets
- European Union
- US
- Canada

**Leverage and bank failure**

- RWA / Tier 1
- Failed
- Survived

**Risk-based capital ratios and bank failures**

- Surviving banks
- Failed banks

Sources: Capital IQ, SNL, published accounts and Bank calculations.

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Source: Capital IQ, SNL Financial, published accounts, Laeven and Valencia (2010) and Bank calculations. Notes:
(a) The classification of bank failure is based on Laeven and Valencia (2010), updated to reflect failure or government intervention since August 2009. (b) Total assets have been adjusted on a best-efforts basis to achieve comparability between institutions reporting under US GAAP and IFRS.
A Checklist Manifesto for Regulation?

A fast-and-frugal tree for categorizing patients as having a high, or low, risk ischemic heart disease

1. **Is the ST segment elevated?**
   - Yes -> **High risk**
   - No -> **Low risk**

2. **Is chest pain the main symptom?**
   - No -> **Low risk**
   - Yes -> **Are there any other symptoms?**
     - No -> **Low risk**
     - Yes -> **High risk**

A fast-and-frugal tree for assessing bank vulnerability

1. **Leverage ratio (balance sheet) < 4.1%?**
   - Yes -> **Red flag**
   - No -> **Market-based capital ratio < 16.8%?**

2. **Market-based capital ratio < 16.8%?**
   - Yes -> **Red flag**
   - No -> **Wholesale funding < US$17.7 billion?**

3. **Wholesale funding < US$17.7 billion?**
   - No -> **Green flag**
   - Yes -> **Loan to deposit ratio > 1.4?**

4. **Loan to deposit ratio > 1.4?**
   - Yes -> **Red flag**
   - No -> **Green flag**
From Ignoring to Managing the Credit Cycle?

Credit cycle and subsequent crises

<table>
<thead>
<tr>
<th>Country</th>
<th>Total peaks 1880-2008*</th>
<th>Crisis years within 5 years following a peak</th>
<th>% peaks with crisis years within the following 5 years</th>
</tr>
</thead>
<tbody>
<tr>
<td>AUS</td>
<td>9</td>
<td>6</td>
<td>67%</td>
</tr>
<tr>
<td>CAN</td>
<td>11</td>
<td>6</td>
<td>55%</td>
</tr>
<tr>
<td>DEU</td>
<td>9</td>
<td>2</td>
<td>22%</td>
</tr>
<tr>
<td>DNK</td>
<td>10</td>
<td>4</td>
<td>40%</td>
</tr>
<tr>
<td>ESP</td>
<td>8</td>
<td>5</td>
<td>63%</td>
</tr>
<tr>
<td>FRA</td>
<td>5</td>
<td>3</td>
<td>60%</td>
</tr>
<tr>
<td>GBR</td>
<td>9</td>
<td>7</td>
<td>78%</td>
</tr>
<tr>
<td>ITA</td>
<td>11</td>
<td>8</td>
<td>73%</td>
</tr>
<tr>
<td>NLD</td>
<td>8</td>
<td>1</td>
<td>13%</td>
</tr>
<tr>
<td>NOR</td>
<td>13</td>
<td>5</td>
<td>39%</td>
</tr>
<tr>
<td>SWE</td>
<td>10</td>
<td>4</td>
<td>40%</td>
</tr>
<tr>
<td>USA</td>
<td>9</td>
<td>6</td>
<td>67%</td>
</tr>
<tr>
<td>Total</td>
<td>112</td>
<td>57</td>
<td>51%</td>
</tr>
</tbody>
</table>

Credit and business cycles

- Credit
- GDP

1880 1900 1920 1940 1960 1980 2000

percent

-20 -15 -10 -5 0 5 10 15 20 25
Counter-Cyclical Regulatory Policy?

**US interest rates**

- Federal Funds Rate
- Simple Taylor Rule


- Dot com Bubble

**Actual and implied capital ratios in the US**

- Actual capital US
- Actual +/- implied


Source: Thompson Reuters DataStream; Bank calculations
Source: BIS, OECD, FDIC and Bank calculations
From Banks to Non-Banks?

Total AUM of US insurance companies, pension funds, mutual funds and other funds

Source: US flow of funds. Notes: (a) Other non-property funds include closed-end funds, exchange-traded funds and money market mutual funds

Assets of Financial Institutions

From National to International?

Capital Stocks and Trade Flows


From National to International?

Ordered by asset

Ordered

Ordered by country

Random
The Limits of Independent Monetary Policy?

Strength of common factor in UK, US and German spot yields at different maturities

Source: Bloomberg and Bank calculations. Notes: Each cell shows the proportion of the variation of weekly changes in UK, US and German interest rates over the past two years explained by the first principal component over those two years. See Haldane (2014) for further details.
The Limits of Independent Macro-Prudential Policy?

Correlation of investment grade corporate bond spreads

Source: BofA Merrill Lynch Global Research, Datastream and Bank calculations. Notes: Overlapping 26 week rolling correlation of weekly changes in investment corporate grade corporate bond spreads.
Conclusion

… unfinished business…