The Fallacy of a Cashless Society

Aleksander Berentsen
Witness for the Defense
Professor of Economic Theory
University of Basel

November 5th, 2015
Two Errors of Thinking

Two errors of thinking for the construction of an argument against cash:

- A new fallacy.
- An old fallacy.
The New Fallacy

- Because of cash, nominal interest rates cannot be set negative (ZLB, ELB).

- Consequently, recent interest rate policies are suboptimal.

- As a result, central banks have to resort to unconventional policies.
The New Fallacy

Because of cash, nominal interest rates cannot be set negative (ZLB, ELB).

Consequently, recent interest rate policies are suboptimal.

As a result, central banks have to resort to unconventional policies.

**Fact:** Moderate negative interest rates are feasible, even in an economy with cash.
The Old Fallacy

- Cash is being used in illegal activities and for tax evasion.
- Hence, by abolishing cash we can eliminate crime and tax evasion.
The Old Fallacy

- Cash is being used in illegal activities and for tax evasion.
- Hence, by abolishing cash we can eliminate crime and tax evasion.

**Fact 1:** Crime and tax evasion activities are constantly evolving.
The Old Fallacy

- Cash is being used in illegal activities and for tax evasion.
- Hence, by abolishing cash we can eliminate crime and tax evasion.

Fact 1: Crime and tax evasion activities are constantly evolving.
Fact 2: Abolishing cash will foster cash-like substitutes.
The new fallacy: Negative interest rates and cash
Cash in Circulation

Cash Swiss Francs in Circulation (Value in Billion CHF) – Data: SNB

Cash in Circulation Compared to Swiss GDP (Annual, Unadjusted) – Data: SNB/OECD

Reaction to NIR?
Cash in Circulation

Cash Swiss Francs in Circulation (Value in Billion CHF) – Data: SNB

Year
Cash Value in Billion CHF
20 30 40 50 60

Cash in Circulation Compared to Swiss GDP (Annual, Unadjusted) – Data: SNB/OECD

Year
Total Cash Value / GDP
0.07 0.09 0.11

©2015 Aleksander Berentsen
Cash in Circulation

Cash Swiss Francs in Circulation (Value in Billion CHF) – Data: SNB

Cash in Circulation Compared to Swiss GDP (Annual, Unadjusted) – Data: SNB/OECD

©2015 Aleksander Berentsen
Cash in Circulation Compared to Swiss GDP (Annual, Unadjusted) – Data: SNB/OECD

Year | Total Cash Value / GDP
--- | ---
2000 | 0.065
2005 | 0.080
2010 | 0.095
2015 | 0.100

CHF Interest Rates (LIBOR 3M) – Data: SNB/FED (FRED Database)

Year | 3 Month Libor CHF in %
--- | ---
2000 | −1
2005 | 0
2010 | 1
2015 | 2

© 2015 Aleksander Berentsen
Cash in Circulation

Cash in Circulation Compared to Swiss GDP (Annual, Unadjusted) – Data: SNB/OECD

Year
Total Cash Value / GDP

0.065 0.080 0.095

CHF Interest Rates (LIBOR 3M) – Data: SNB/FED (FRED Database)

Year
3 Month Libor CHF in %

−1 0 1 2 3

©2015 Aleksander Berentsen
Cash in Circulation

Cash in Circulation Compared to Swiss GDP (Annual, Unadjusted) – Data: SNB/OECD

<table>
<thead>
<tr>
<th>Year</th>
<th>2000</th>
<th>2005</th>
<th>2010</th>
<th>2015</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total Cash Value / GDP</td>
<td>0.065</td>
<td>0.080</td>
<td>0.095</td>
<td></td>
</tr>
</tbody>
</table>

CHF Interest Rates (LIBOR 3M) – Data: SNB/FED (FRED Database)

<table>
<thead>
<tr>
<th>Year</th>
<th>2000</th>
<th>2005</th>
<th>2010</th>
<th>2015</th>
</tr>
</thead>
<tbody>
<tr>
<td>3 Month Libor CHF in %</td>
<td>-1</td>
<td>0</td>
<td>1</td>
<td>2</td>
</tr>
</tbody>
</table>

©2015 Aleksander Berentsen
Cash is Expensive

Costs:
- Storage and handling
- Security
- Insurance
- Anti Money Laundering Laws

Returns:
- Positive real return with deflation
- Negative real return with inflation

Opportunity cost
- Riskless nominal bond

©2015 Aleksander Berentsen
Cash is Expensive

- Costs:
  - Storage and handling
  - Security
  - Insurance
  - Anti Money Laundering Laws
Cash is Expensive

- **Costs:**
  - Storage and handling
  - Security
  - Insurance
  - Anti Money Laundering Laws

- **Returns:**
  - Positive real return with deflation
  - Negative real return with inflation
Cash is Expensive

Costs:
- Storage and handling
- Security
- Insurance
- Anti Money Laundering Laws

Returns:
- Positive real return with deflation
- Negative real return with inflation

Opportunity cost
- Riskless nominal bond
Cash is Dominated in Return

Historically, cash has been dominated in return. So, why are people willing to hold cash?
Cash is Dominated in Return

Historically, cash has been dominated in return. So, why are people willing to hold cash?

- As an insurance against really bad outcomes:
  - Lehman Collapse.
  - Sovereign Debt Crisis.
  - Confiscatory Taxes (Cyprus, Argentina, etc.).
  - Grexit: Forced conversion.
Historically, cash has been dominated in return. So, why are people willing to hold cash?

- As an insurance against really bad outcomes:
  - Lehman Collapse.
  - Sovereign Debt Crisis.
  - Confiscatory Taxes (Cyprus, Argentina, etc.).
  - Grexit: Forced conversion.

- To avoid dependence on third party transaction processing:
  - Surveillance.
Cash is Dominated in Return

Historically, cash has been dominated in return. So, why are people willing to hold cash?

- As an insurance against really bad outcomes:
  - Lehman Collapse.
  - Sovereign Debt Crisis.
  - Confiscatory Taxes (Cyprus, Argentina, etc.).
  - Grexit: Forced conversion.

- To avoid dependence on third party transaction processing:
  - Surveillance.

- For its transaction services:
  - Immediate settlement (no debt involved).
  - Anonymity.
  - Ease of use.
The New Fallacy

Because of cash, nominal interest rates cannot be set to negative (ZLB, ELB).

Consequently, recent interest rate policies are suboptimal.

As a result, central banks have to resort to unconventional policies.

Fact: Moderate negative interest rates are feasible, even in an economy with cash.
Because of cash, nominal interest rates cannot be set to negative (ZLB, ELB).

Consequently, recent interest rate policies are suboptimal.

As a result, central banks have to resort to unconventional policies.

**Fact:** Moderate negative interest rates are feasible, even in an economy with cash.

**Conclusion:** There is no need to abolish cash.
Digression: Real negative interest rates are a bad idea in the first place.
**Negative Interest Rates**

- The Amazing Pumpkin Investment Opportunity:

  1. Borrow 1,000 pumpkins at NIR of -1%.
  2. Plant 1,000 pumpkins to grow 998 new ones.
  3. Pay back 990 pumpkins.

  **Individual Profit:** 8 pumpkins
  **Social Loss:** 2 pumpkins
Negative Interest Rates

- The Amazing Pumpkin Investment Opportunity:

  Step 1: Borrow 1’000 Pumpkins at NIR of -1%.

  Individual Profit: 8 pumpkins
  Social Loss: 2 pumpkins

Fisher Equation

Going Buiter

Buiter’s Would-Be Symmetry
Negative Interest Rates

The Amazing Pumpkin Investment Opportunity:

Step 1: Borrow 1’000 Pumpkins at NIR of -1%.
Step 2: Plant 1’000 Pumpkins to grow 998 new ones.
Negative Interest Rates

The Amazing Pumpkin Investment Opportunity:

**Step 1:** Borrow 1’000 Pumpkins at NIR of -1%.

**Step 2:** Plant 1’000 Pumpkins to grow 998 new ones.

**Step 3:** Pay back 990 pumpkins.
Negative Interest Rates

The Amazing Pumpkin Investment Opportunity:

Step 1: Borrow 1’000 Pumpkins at NIR of -1%.
Step 2: Plant 1’000 Pumpkins to grow 998 new ones.
Step 3: Pay back 990 pumpkins.

Individual Profit: 8 pumpkins
Negative Interest Rates

The Amazing Pumpkin Investment Opportunity:

- **Step 1:** Borrow 1’000 Pumpkins at NIR of -1%.
- **Step 2:** Plant 1’000 Pumpkins to grow 998 new ones.
- **Step 3:** Pay back 990 pumpkins.

- **Individual Profit:** 8 pumpkins
- **Social Loss:** 2 pumpkins

©2015 Aleksander Berentsen
The Amazing Pumpkin Investment Opportunity:

Step 1: Borrow 1’000 Pumpkins at NIR of -1%.
Step 2: Plant 1’000 Pumpkins to grow 998 new ones.
Step 3: Pay back 990 pumpkins.

Individual Profit: 8 pumpkins
Social Loss: 2 pumpkins
Negative Interest Rates

The Amazing Pumpkin Investment Opportunity:

Step 1: Borrow 1’000 Pumpkins at NIR of -1%.
Step 2: Plant 1’000 Pumpkins to grow 998 new ones.
Step 3: Pay back 990 pumpkins.

Individual Profit: 8 pumpkins
Social Loss: 2 pumpkins
Negative Interest Rates

- The hunt for investment opportunities:
  - Real estate and housing bubble
  - Stock market bubble
  - Fixed income bubble
  - Art bubble
  - ...
The old fallacy: Cash is used in illegal activities and for tax evasion. Hence, we need to abolish cash to fight crime and tax evasion.
No Cash, No Crime, No Tax Evasion

- Observation: Black and gray market activities often involve cash.
  - Informal sector / tax evasion
  - Illegal activities / money laundering
Crime and Tax Evasion are Constantly Evolving

- Crime and tax evasion activities preceed cash.

- Crime and tax evasion activities are adapting.

- Example: New opportunities to make a living as an e-fraudster:
  - e-crime / cyber theft / identity theft
  - Single point of failure attacks.
Cash Substitutes are Available

What would be the reaction to a prohibition of cash?
Cash Substitutes are Available

- Bitcoin (or any other Blockchain-based Cryptocurrency)
Cash Substitutes are Available

- Bitcoin (or any other Blockchain-based Cryptocurrency)
  - Transaction not subject to (specific) third party processing.
    - No middleman.
Cash Substitutes are Available

- Bitcoin (or any other Blockchain-based Cryptocurrency)
  - Transaction not subject to (specific) third party processing.
    - No middleman.
  - No control by any central bank.
Cash Substitutes are Available

- Bitcoin (or any other Blockchain-based Cryptocurrency)
  - Transaction not subject to (specific) third party processing.
    - No middleman.
  - No control by any central bank.
  - Regulatory resistance.
## Cash v. Cash-Like

<table>
<thead>
<tr>
<th></th>
<th>No middleman</th>
<th>immediate settlement</th>
<th>person 2 person</th>
<th>in stores</th>
<th>online</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cash:</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Bitcoin:</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>(X)</td>
<td>(X)</td>
</tr>
<tr>
<td>DebC/CC:</td>
<td></td>
<td></td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Paypal:</td>
<td></td>
<td></td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Paymit:</td>
<td></td>
<td></td>
<td>X</td>
<td>announced</td>
<td></td>
</tr>
<tr>
<td>Twint:</td>
<td></td>
<td></td>
<td>X</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>Apple Pay:</td>
<td></td>
<td></td>
<td></td>
<td>(X)</td>
<td>(X)</td>
</tr>
</tbody>
</table>
The Old Fallacy

- Cash is being used in illegal activities and for tax evasion.
- Hence, by abolishing cash we can eliminate crime and tax evasion.

Fact 1: Crime and tax evasion activities are constantly evolving.
Fact 2: Abolishing cash will foster cash-like substitutes.
The Old Fallacy

- Cash is being used in illegal activities and for tax evasion.
- Hence, by abolishing cash we can eliminate crime and tax evasion.

**Fact 1:** Crime and tax evasion activities are constantly evolving.
**Fact 2:** Abolishing cash will foster cash-like substitutes.

**Conclusion:** Prohibition of cash...
- has no effect on crime or tax evasion.
- is self-defeating for CB: loss of seignorage income.
Two errors of thinking for the construction of an argument against cash:

- A new fallacy.
- An old fallacy.
Appendix

Relative Return Rates

The Fisher Equation:

\[ i_t \approx r_t + E(\pi_{t+1}) \]
Relative Return Rates

The Fisher Equation:

\[ i_t \approx r_t + E(\pi_{t+1}) \]

The Keynesian View: \( E(\pi_{t+1}) \) is fixed:

\[ i_t \approx r_t + \frac{E(\pi_{t+1})}{\pi_{t+1}} \]
Relative Return Rates

The Fisher Equation:

\[ i_t \approx r_t + E(\pi_{t+1}) \]

The Keynesian View: \( E(\pi_{t+1}) \) is fixed:

\[ i_t \approx r_t + \overline{E(\pi_{t+1})} \]

Central Bank Stimulus:

\[ i_t \downarrow \approx r_t + \overline{E(\pi_{t+1})} \]
Relative Return Rates

The Fisher Equation:

\[ i_t \approx r_t + E(\pi_{t+1}) \]

The Keynesian View: \( E(\pi_{t+1}) \) is fixed:

\[ i_t \approx r_t + \overline{E(\pi_{t+1})} \]

Central Bank Stimulus:

\[ i_t \downarrow \approx r_t \downarrow + \overline{E(\pi_{t+1})} \]
Relative Return Rates

Normal times:

\[ i_t \approx r_t + E(\pi_{t+1}) \]

Central bank stimulus in economic downturn:

\[ i_t \approx r_t + E(\pi_{t+1}) \]

Central bank stimulus in Great Recession:

\[ i_t \approx r_t - 2\% + E(\pi_{t+1}) \]

To be continued?
Relative Return Rates

Normal times:

\[
i_t \approx r_t + E(\pi_{t+1})
\]

Central bank stimulus in economic downturn:

\[
i_t = r_t + E(\pi_{t+1})
\]

To be continued?
Appendix

Relative Return Rates

Normal times:

\[ i_t \approx r_t + E(\pi_{t+1}) \]

Central bank stimulus in economic downturn:

\[ i_t \approx r_t + E(\pi_{t+1}) \]

Central bank stimulus in Great Recession:

\[ i_t \approx r_t + E(\pi_{t+1}) \]
Relative Return Rates

Normal times:

$$i_t \approx r_t + \frac{E(\pi_{t+1})}{2\%}$$

Central bank stimulus in economic downturn:

$$i_t \approx r_t + \frac{E(\pi_{t+1})}{2\%}$$

Central bank stimulus in Great Recession:

$$i_t \approx r_t + \frac{E(\pi_{t+1})}{2\%}$$

To be continued?

$$i_t \approx r_t + \frac{E(\pi_{t+1})}{2\%}$$
Going “Buiter”

“But the effective lower bound on nominal interest rates is unlikely to be at the -5% or -10% that central banks may at times wish to set the policy rates at.”

Buiter and Rahbari (2015)

Conclusion: Keep cash to prevent CB from going “Buiter”.
“Bringing symmetry to the central bank’s traditional policy instrument, the official policy rate clearly makes sense.”

Buiter and Rahbari (2015)

Investment 1’000 pumpkins:

<table>
<thead>
<tr>
<th>Rate</th>
<th>Minimum Return</th>
<th>Private Gain</th>
<th>Social Gain</th>
</tr>
</thead>
<tbody>
<tr>
<td>5%</td>
<td>$\geq +5%$</td>
<td>+</td>
<td>+</td>
</tr>
<tr>
<td>-5%</td>
<td>$\geq -5%$</td>
<td>+</td>
<td>+/-</td>
</tr>
</tbody>
</table>
Disclaimer 1: The content of this presentation reflects my own opinion and does in no way reflect the view of any other person or institution.
Disclaimer 2: The reasons for William H. Buiter’s push toward a cashless society, of course, have nothing to do with pumping up earnings from bank card fees for Citibank.