

Revisions of Estimation Methods for Cash Holdings by Households and Corporations in Japan's Flow of Funds Accounts

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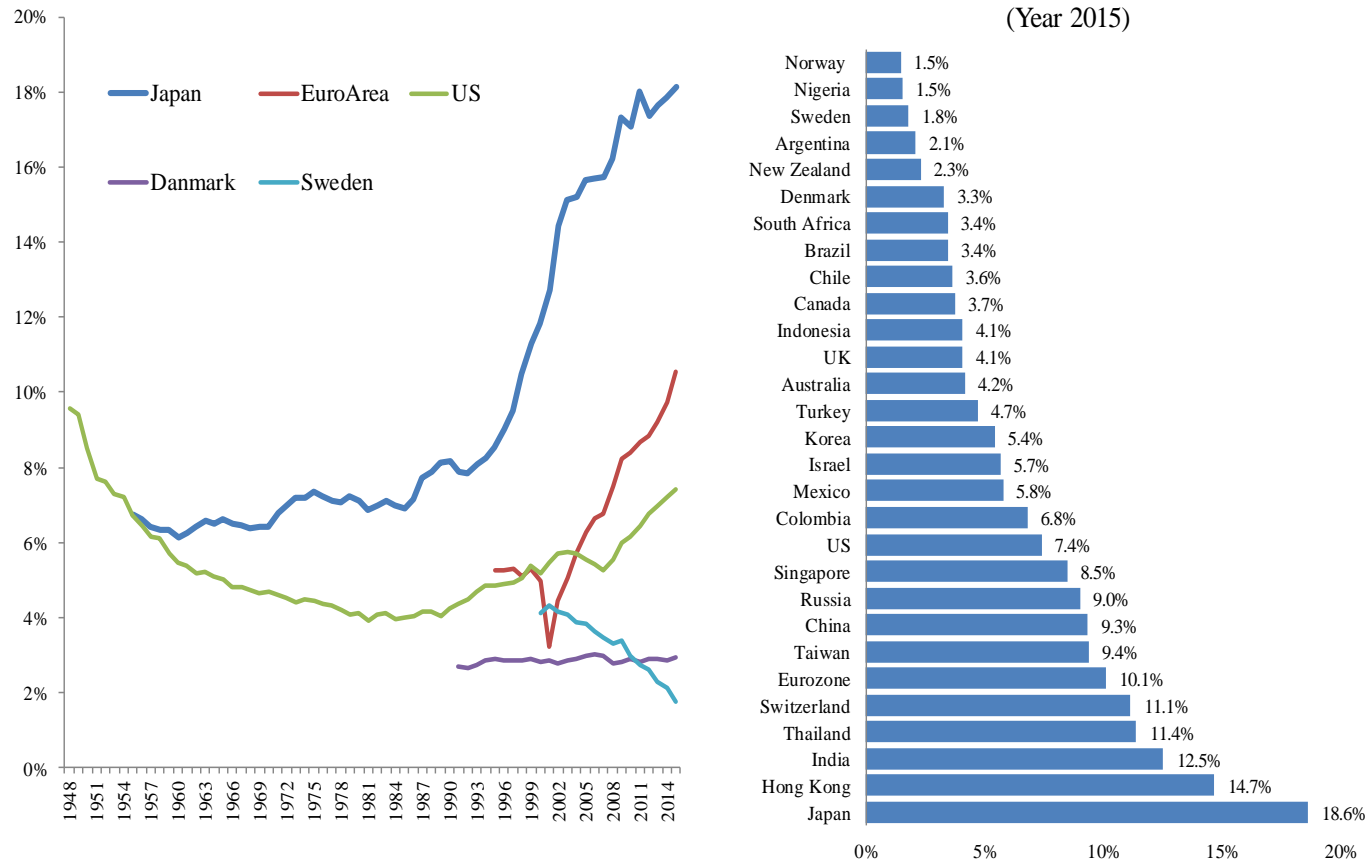
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Currency Outstanding

- The amount of **currency outstanding** has **diverged across countries**, reflecting differences in **institutions**, **interest rates**, and **other social factors**...

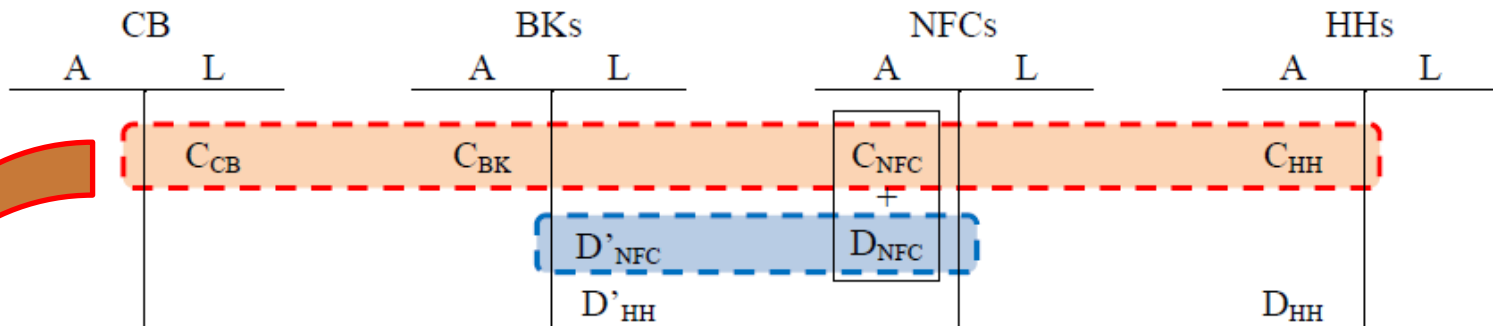
Figure 1: Currency-GDP Ratio



Source: Rogoff (2016), UN, Denmark National Bank

Current Estimation Method

Figure 2: Cash and Deposits in Balance Sheet by Sector (Simple Illustration)



Note: CB=Central Bank, BK=Commercial Bank, NFC=Non-Financial Corporation, HH=Household;
A=Assets, L=Liabilities, C=Cash, D=Deposits

$$\text{Cash holdings of households: } C_{HH} = a * (C_{CB} - C_{BK})$$

$$\text{Cash holdings of NFCs: } C_{NFC} = (1-a) * (C_{CB} - C_{BK})$$

where a = ratio of transferable deposits for HHs = 0.7

(Problem)

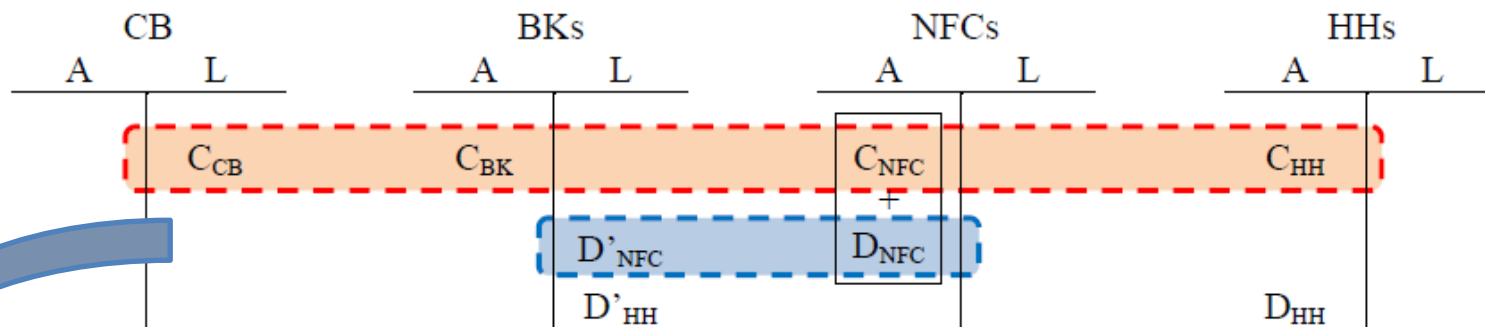
Applying the ratio between HHs and NFCs **for transferable deposits** to the ratio **for cash**

Questions

- Are **cash and deposits recorded separately** in the financial accounts in your country?
- **What method** do you use **to estimate cash holdings** (or cash and deposits) **by sector**?
- Which data are **more reliable**, **households** or **corporations**?

Alternative Estimation Method 1

- making use of two different data sources: 1) corporation survey; and 2) bank deposit data for NFCs



Note: CB=Central Bank, BK=Commercial Bank, NFC=Non-Financial Corporation, HH=Household; A=Assets, L=Liabilities, C=Cash, D=Deposits

$$\text{Cash holdings of NFCs: } C_{NFC} = [C_{NFC} + D_{NFC}] - D'_{NFC}$$

corporation
survey

bank deposit
data

(Problem)

Potential estimation errors due to...

- 1) **insufficient adjustments of differences in definitions** between data sources; and
- 2) estimation **errors inherited in corporation survey**

Alternative Estimation Method 2

• making use of:

- 1) **cash-sales ratio** from **survey for sole proprietorship**, assuming a proportional relationship between sales proceeds and cash holdings; and
- 2) applying **the ratio for sole proprietorship** to **sales for corporations** in “cash-oriented” industries

sole proprietorship survey corporation survey

Cash holdings of NFCs by industry: ${}_i C_{NFC} = {}_i (C/S)_{SP} * {}_i S_{NFC}$;
Cash holdings of NFCs on aggregate: $C_{NFC} = \sum_i C_{NFC}$,

where S=Sales, SP=Sole Proprietorship, i=“cash-oriented” industry.

Note: “cash-oriented” industries include retail trade, accommodations and food services, and amusement services; “non cash-oriented” industries include manufacturing, construction, utilities, and, information and communication.

(Problem)

Potential estimation bias due to...

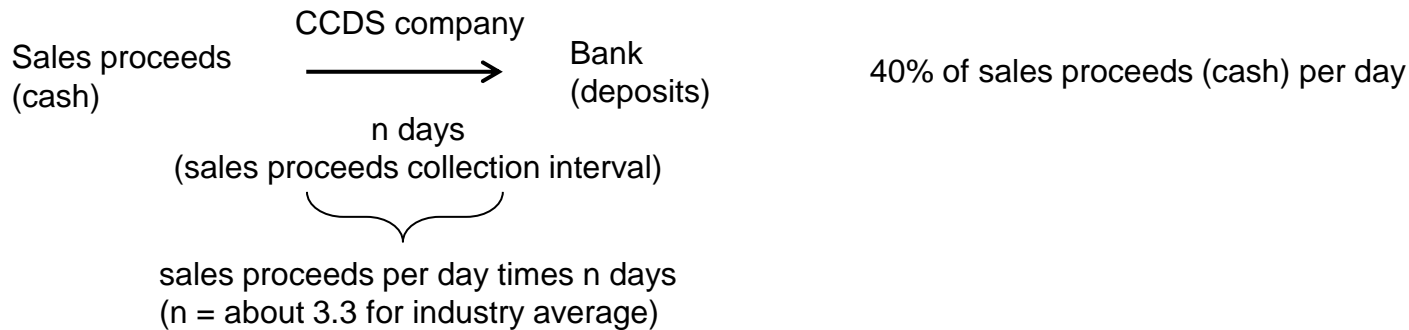
- 1) **cash-sales ratio likely higher** for sole proprietorship, and cash reported **including checks** (upward bias); and
- 2) **excluding “non cash-oriented” industries** likely to underestimate (downward bias).

Alternative Estimation Method 3

- making use of data from **cash collection and delivery services (CCDS) companies**, providing information about cash holdings of NFCs **without directly surveying individual NFCs**

(1) Pre-Deposited Sales Proceeds

(2) Cash Retained in the Register



Cash holdings of NFCs: $C_{NFC} = [(1) + (2)]$, aggregated for “cash-oriented” industries

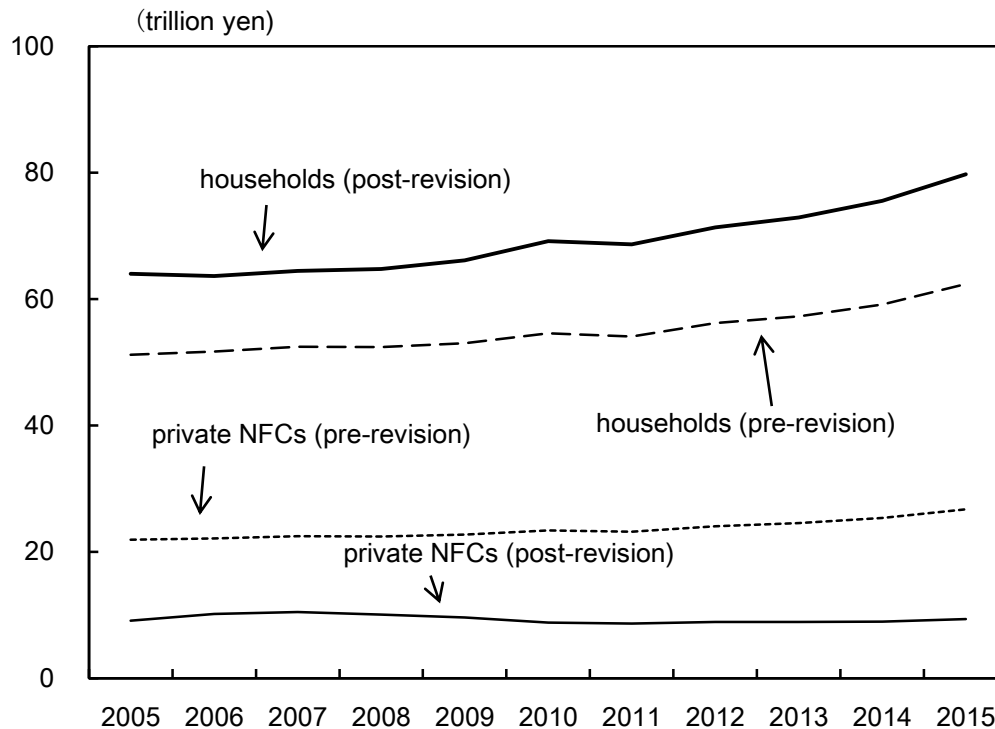
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Potential estimation bias due to...

- 1) **excluding “non cash-oriented” industries** likely to underestimate (downward bias);
- 2) **selection of companies** with relatively **large cash transactions** (upward bias).

Estimation Results

- 3 mutually independent methods turned out to yield similar estimation results!
- The share of households in cash holdings revised up from 70% to 90%; that for NFCs revised down from 30% to 10%.



In 2015,
Cash holdings of households
= 80 trillion yen;
Cash holdings of NFCs
= 9 trillion yen

Remaining Issues

- **Estimation errors with households** due to a residual, as alternative methods directly estimating corporations
 - eg, **the assumption of no overseas' cash holdings** is likely to overestimate households
 - Yet, estimating overseas' cash holdings poses a challenge due to **data limitations**
- Still, **direct survey for households is unreliable**

Verdict

- Among 3 methods, **alternative estimation method 2** is chosen.
 - The other methods poses practical challenges.
 - ✓ **Method 3** using CCDS companies incurs **reporting burden and survey costs** for estimation updates.
 - ✓ **Method 1** using subtraction of two statistics results in **large estimation errors**.
 - **Method 2** using published statistics makes **periodical updates less costly**.

References

- Rogoff, K. (2016). The curse of cash. Princeton University Press.

The End



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