Producing Liquidity
Dennis Fixler and Kim Zieschang

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Introduction

• Liquidity services are crucial function of financial markets
• Banks major providers of liquidity services
• Liquidity services tied to credit services
• Kashyap, Rajan and Stein (2002) “Banks as Liquidity Providers: An Explanation of the Coexistence of Lending and Deposit-Taking” *Journal of Finance* the synergy between the two

• Text book definition of endogenous money supply process

  Excess reserves (deposits) $\rightarrow$ Loans $\rightarrow$ Deposits
Introduction

• Liquidity services usually measured by deposit levels
• In this paper, user cost based measure of liquidity services
• Instead of loan levels, user cost based measure of credit services
• Starting point national account treatment of FISIM—Financial Services Indirectly Measured
• We develop an endogenous reference rate for the computation of FISIM
Liquidity services in the national accounts [1]

• Liquidity services (e.g., from deposits) have always been booked as produced by financial institutions (issuers of liquidity instruments) and implicitly purchased by the counterparty sectors of those institutions (holders)


An income is imputed to bank depositors for the use of their money equal to the excess of interest and dividends received by banks over interest paid out and this income assumed to be used in “paying” for uncharged banking services. In the case of persons, this imputed income and outlay appears on either side of the revenue account of persons, but in the case of enterprises of all kinds, the imputed outlay is charged to the operating account, thus restricting the effect of this adjustment to the operating surplus alone. (p. 41)

• 1953 – A System of National Accounts and Supporting Tables same as Stone (1947)

• 1993, 2008 – System of National Accounts

Some of the “excess of interest and dividends received by banks over interest paid out” is attributed to banks’ asset (e.g., loan) operations, with the remainder going to banks’ depositors (1993 and 2008 SNA) and other funders (1993 SNA)
Liquidity services in the national accounts

• Indirectly measured deposit services = 

  (“reference rate of interest” – monetary interest paid on deposits) × deposits

What is the reference rate of interest?
• 1993 SNA – interbank lending rate (usually risk-free)
• 2008 SNA – rate reflecting the risk and maturity of deposits and loans, or the interbank rate
• Suggestion: the bank cost of capital

• Owners of deposits use these services, but who produces them?
  • The issuer of the deposit (bank): the produced liquidity treatment
  • The owner of the deposit (various sectors, including banks): the primary service liquidity treatment
  • Suggestion: notional user cost—primary service liquidity—shows what holder is willing to pay for liquidity, produced liquidity shows what holder actually pays

• Scope of bank funding instruments generating liquidity services
  • 1953 SNA – deposits; 1993 SNA – all non-equity funding, including deposits; 2008 SNA – deposits
  • Suggestion: all non-equity funding; greater consistency with instrument coverage of liquidity in monetary literature (not just deposits)

• Scope of units whose liabilities are associated with liquidity
  • SNA: financial corporations, but essentially banks with financial corporations
  • Suggestion: Other units (nonfinancial corporations and general government) issue debt instruments and liquidity in its broadest form is associated with those instruments
Liquidity services in the national accounts

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Owners of deposits use these services, but who produces them?
Math: some identities

• Income = expense

\[ p'y + r'_K K + r'_F F \equiv v'x + w'L + T + \delta' K + r'_D D + r'_E E \]

• Balance sheet

\[ t'K + t'F \equiv t'D + E \]

• Reference rate (cost of capital, where caret indicates “security equivalent rate”)

\[ \bar{r} = \frac{\hat{r}'_D D + r'_E E}{t'D + E} \]

• Output = input (production identity) derived from the above

\[ p'y + (r_K - \bar{r}t - \delta)'_+ K + (r_F - \bar{r}t)'_+ F - (r_D - \bar{r}t)'_- D \]

\[ \equiv v'x + w'L + T - (r_K - \bar{r}t - \delta)'_- K - (r_F - \bar{r}t)'_- F + (r_D - \bar{r}t)'_+ D + (r_E - \bar{r}) E \]
Produced liquidity

Produced liquidity is a subcomponent of the item in the production identity showing the value of services from debt funding $D$ (including deposits)

\[
p'y + \left((r_K - \bar{r}_t - \delta)\right)_+ K + \left((r_F - \bar{r}_t)\right)_+ F - \left((r_D - \hat{r}_D)\right)_- D - \left((\hat{r}_D - \bar{r}_t)\right)_- D
\]

\[
= v'x + w'L + T - \left((r_K - \bar{r}_t - \delta)\right)_- K - \left((r_F - \bar{r}_t)\right)_- F + \left((r_D - \bar{r}_t)\right)_+ D + \left((r_E - \bar{r})\right)E
\]

where total services from deposits can be written as

\[
(\bar{r}_t - r_D)' D = (\bar{r}_t - \hat{r}_D)' D + (\hat{r}_D - r_D)' D
\]

and from rearrangement of the cost of funds definition

\[
(\bar{r}_t - \hat{r}_D)' D \equiv (r_E - \bar{r})E.
\]
Produced Credit Services

- Produced credit services consists of account servicing and asset management services

\[ p'y + r'_i K + (r_F - \bar{r}_t)' F - (r_D - \bar{r}_t)' D \]

\[ = v'x + w'H + T + (\bar{r}_t + \delta)' K - (r_F - \bar{r}_t)' F + (r_D - \bar{r}_t)' D + (r_E - \bar{r}) E \]

- The expression in the box in the revenue function

- Decomposition

\[ (r'_F - \bar{r}_t)' F = (r_F - r_S)' F + (r_S - \bar{r}_t)' F; \text{ where } r_S \text{ is a security rate} \]

Asset Manag  Account Serv
US Banks (FDIC data): Cost of funds/capital

- Cost of funds - book values for nonfinancial assets and thus equity
- Cost of funds - estimated market values for equity liabilities and nonfinancial assets
- Cost of funds - estimated market values, including holding gains in return on equity
Loan/Deposit levels vs Credit/Liquidity services

• The loan to deposit ratio is often taken as indicator of bank operations and a measure of illiquidity

• The following chart shows the difference between looking at levels at loans and deposits versus the related credit and liquidity service levels

• Shaded area denotes recessions—NBER dates

• After consider liquidity and credit services separately
Liquidity Services and Deposit Levels

• Components of liquidity service—narrow definition—only includes account servicing and liquidity provision for deposits

• Scaled to GDP

• Note the divergence between Liquidity behavior and Deposit behavior during the 2008 recession

• Rate differential chart below shows the influence of the rate movements
Narrow Liquidity and Deposit Ratios to GDP (Endogenous Ref.)

- [1] Deposit liabilities: account servicing
- [7] Deposit liabilities: liquidity provision

Narrow Deposits

Rate Differentials
Credit Services and Loan Levels


- Following chart shows credit services and loan levels scaled to GDP.

- Rate differentials are shown below for the component services.

- Note the asset management is the most influential and can see that this largely follows the rate differential.
Credit and Loan Relative to GDP (Endogenous Ref.)

- [3] Loan assets: account servicing
- [6] Loan assets: asset management
- Credit
- Loans (Levels)

Rate Differential


US Banks (FDIC data): Share of produced liquidity in indirectly measured bank services (FISIM)
US banks (FDIC data): Trends in indirectly measured bank services (FISIM)
Comparison with BEA reference rate

• Since the BEA reference rate is used to compute US FISIM it is interesting to see what the difference in the reference rate is and what it may mean

• BEA reference rate exogenous

• Consists of Treasury securities of different maturities; so risk free and thereby services include risk bearing

• Essentially a book value from FDIC data

• Some adjustments entail adding a short term Treasury to overcome lag impact for business cycles

• Discussion of changes in recent SCB article “Measuring the Services of Commercial Banks in the National Income and Products Accounts: Changes in Concepts and Methods in the 2013 Comprehensive Revision” by Hood

Endogenous Ref. vs. BEA Ref.

- BEA reference
- Endogenous reference
Loans/Deposits vs. Credit/Liquidity (Endogenous Ref.)

Loans/Deposits vs. Credit/Liquidity (BEA Ref.)
Loans/Deposits versus Credit/Liquidity

• As with endogenous reference rate, the two series appear negatively correlated; except during 2008 recession

• Comparison of correlations between the series shows differences between recession and non-recession periods for endogenous and BEA reference rates
  – For endogenous rates
    • Correlation of non-recession period: -0.74
    • Correlation of recession period: -0.48
  – For BEA rates
    • Correlation of non-recession period: -0.60
    • Correlation of recession period: 0.77
  – More stable in and out of recession correlation results using cost of capital, endogenous reference rate
Liquidity Services and Deposit Levels

• As before look at the path of the Deposit and Liquidity levels scaled by GDP

• Deposits and Liquidity during the 2008 recession move differently than with the endogenous reference rate.
Credit Services and Loan Levels

• Comparing credit services and loan levels scaled by GDP
• The movements of the two series and their underlying components are different than that with the endogenous reference rate during the 2008 recession
Credit and Loans Relative to GDP (BEA Ref.)

[3] Loan assets: account servicing
[6] Loan assets: asset management
Credit
Loans (Levels)

Rate Differentials
Concluding Remarks

• The produced liquidity approach—consistent with national accounts thinking since 1947—highlights the role of banks in transforming the leverage risk bearing primary service provided by equity holders into (produced) liquidity services for depositors and the other non-equity funders of banks

• Examining liquidity and credit services instead of loan and deposit levels can affect a macroeconomic narrative

• The results suggest that a macroeconomic narrative can be affected by the choice of reference rate

• Results were in terms of nominal values of credit and liquidity services; future work will focus on producing volume measures so as to better measure the role of both the liquidity and credit services in economic activity.