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An early stablecoin?
The Bank of Amsterdam and the governance of money

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BIS / Bank of England CEPR conference on "Financial innovation: implications for competition, regulation and monetary policy", 24 September 2020

A rigid stablecoin: the Bank of Amsterdam over 1609-1683

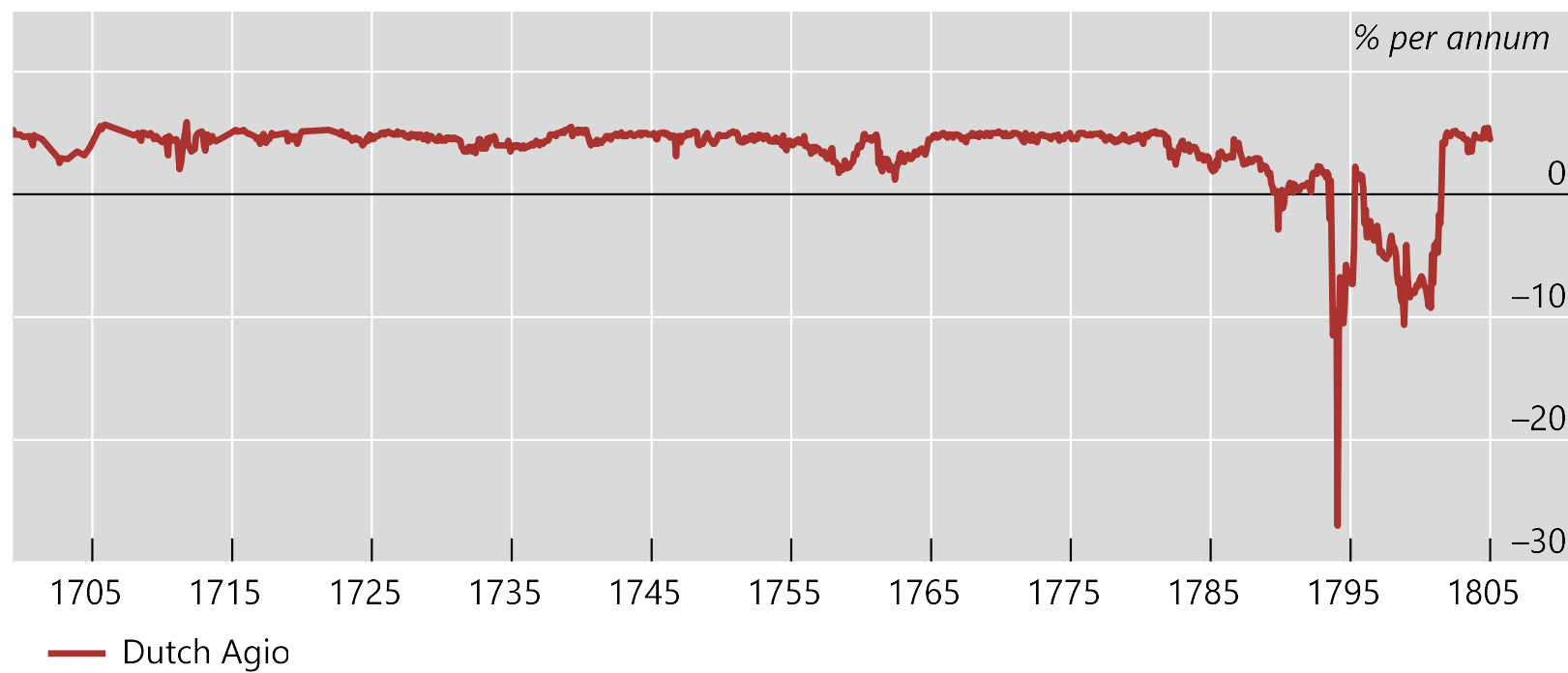| Assets	Liabilities
	Deposits

An impeccable reputation

"At Amsterdam, however, no point of faith is better established than that for every guilder, circulated as bank money, there is a correspondent guilder in gold or silver to be found in the treasure of the bank"

(Adam Smith, *Wealth of Nations*, 1776)

The Dutch agio: a gauge of trust

% per annum

Dutch Agio

End-of-month value.

Source: van Zanden and van Leeuwen (2012).

From rigid stablecoin to proto-central bank

# From rigid stablecoin to proto-central bank

- Adjusting money stock for settlement liquidity in wholesale payment system

- Lending operations

- Exchange rate targeting through a currency board

The "receipts" system and money creation

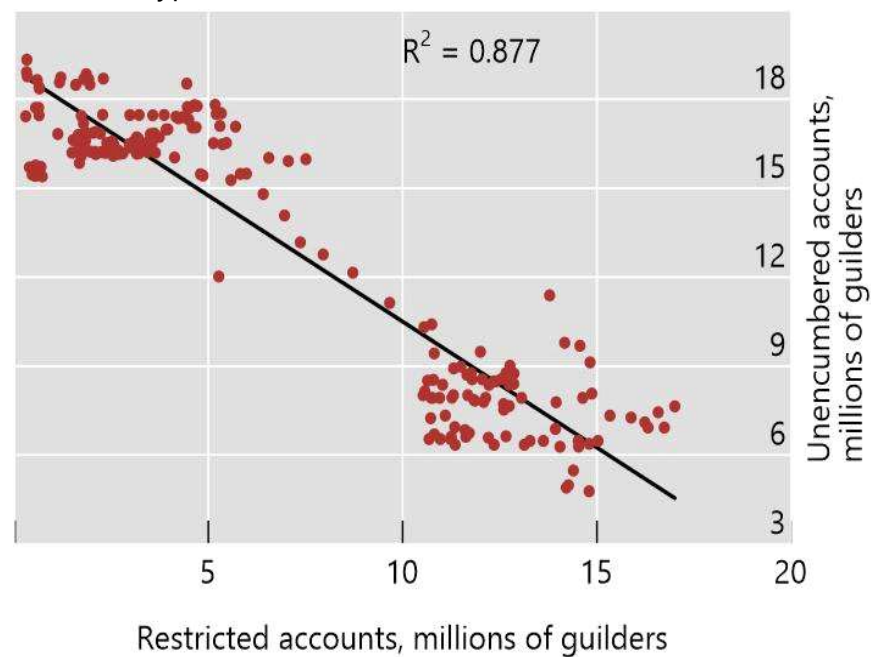|	Assets	Liabilities
		Encumbered deposits
		Unencumbered deposits

Monetary operations

The Bank created and purchased coin to make up for falling receipts
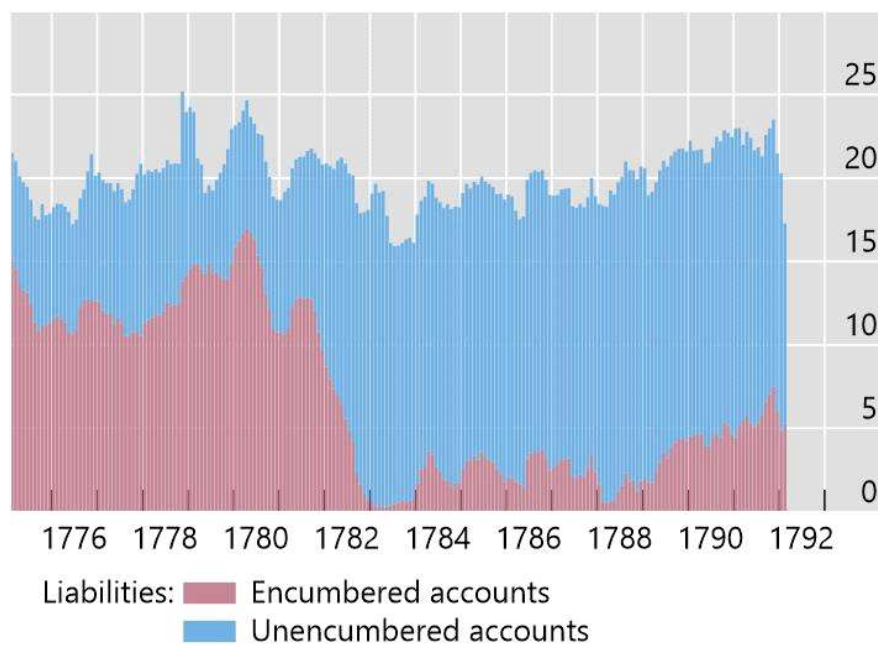
The two types of accounts substituted for one another

Composition of Bank of Amsterdam assets (Quinn and Roberds 2014 – 19)

Millions of guilders

Legend:
- Total Of Balances
- Metal Stock
- Debt of The East India Company
- Debt of The Town Treasury
- Debt of The Loan Chamber

Crisis of 1763

Millions of guilders

Legend:
- —— Total Of Balances
- Metal Stock
- Debt of The East India Company
- Debt of The Town Treasury
- Debt of The Loan Chamber
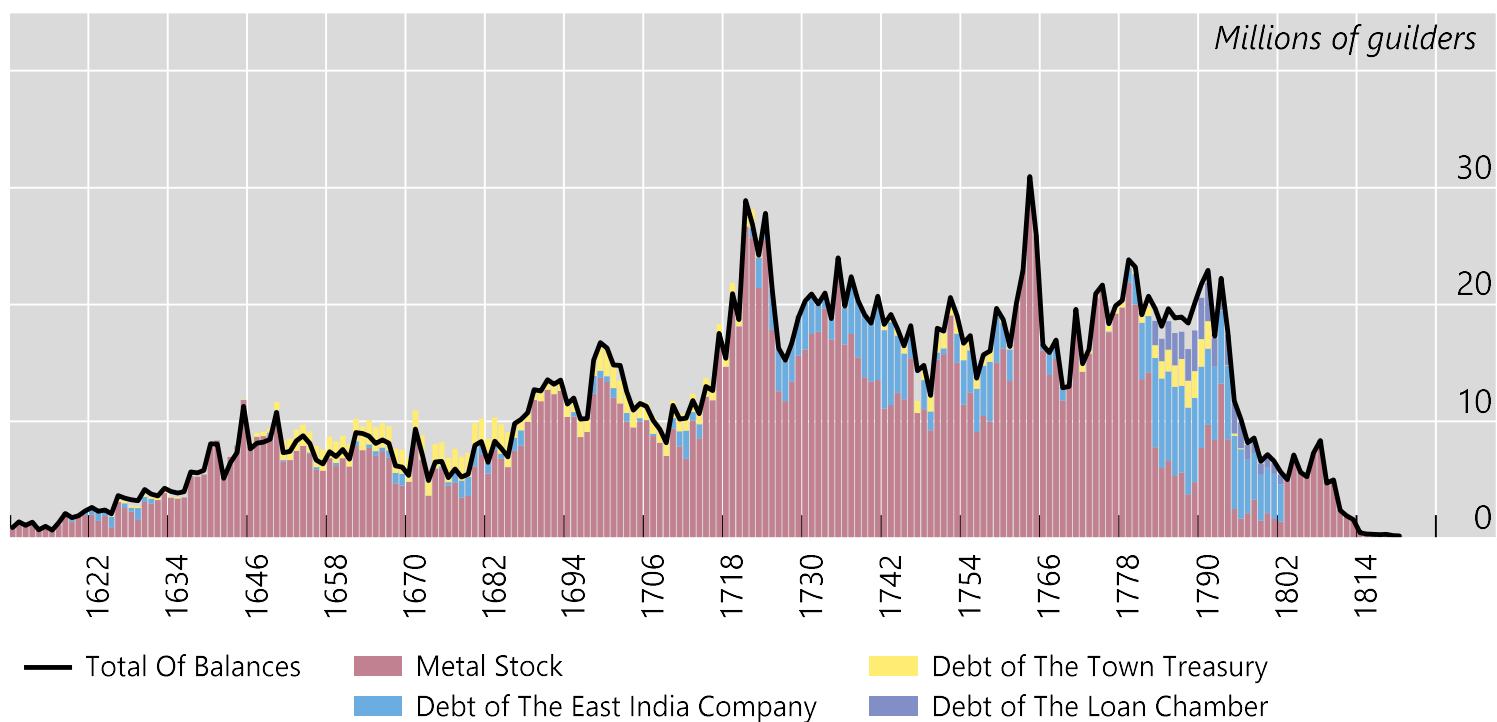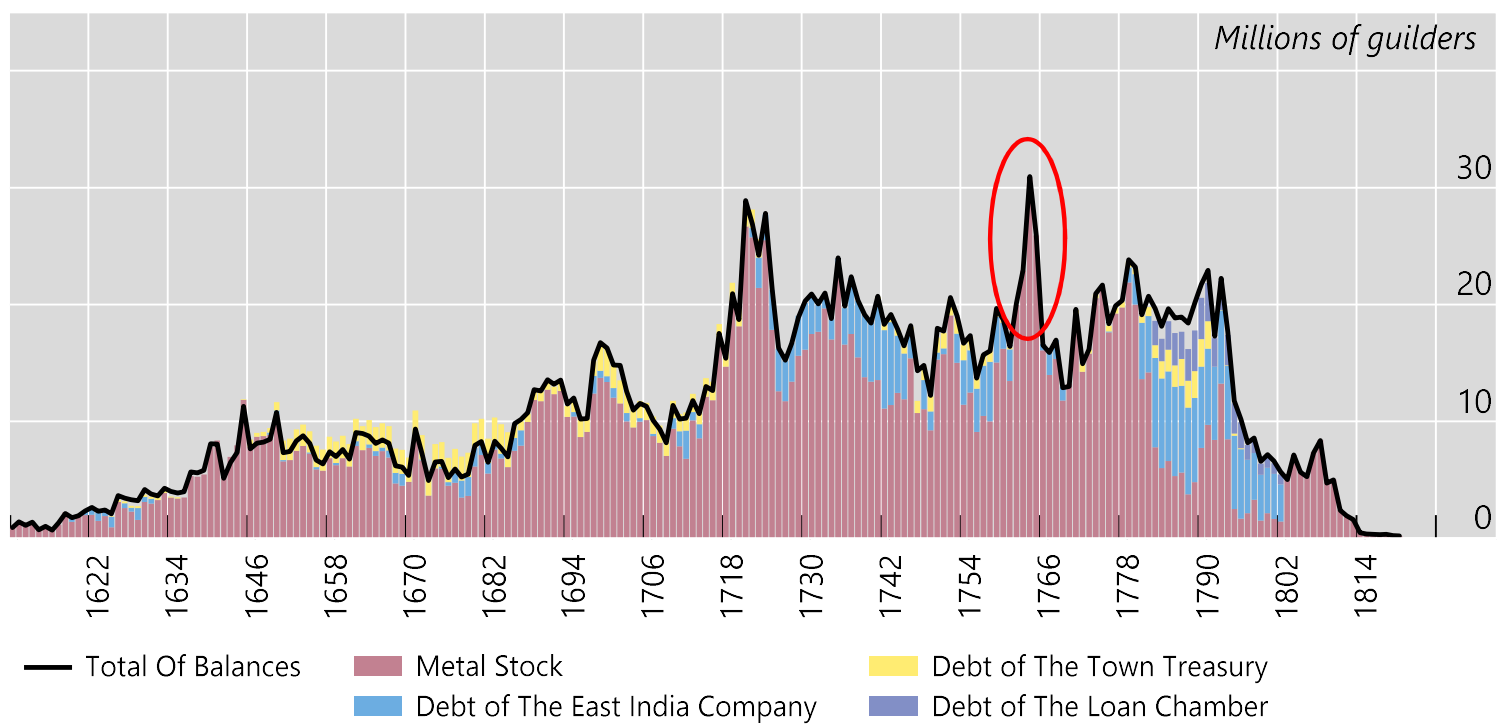
The need for settlement liquidity: the Dutch East India Company (VOC)

The geographic reach of the VOC

Short-term lending operations

Ship arrivals and departures showed a seasonal pattern

No of ships

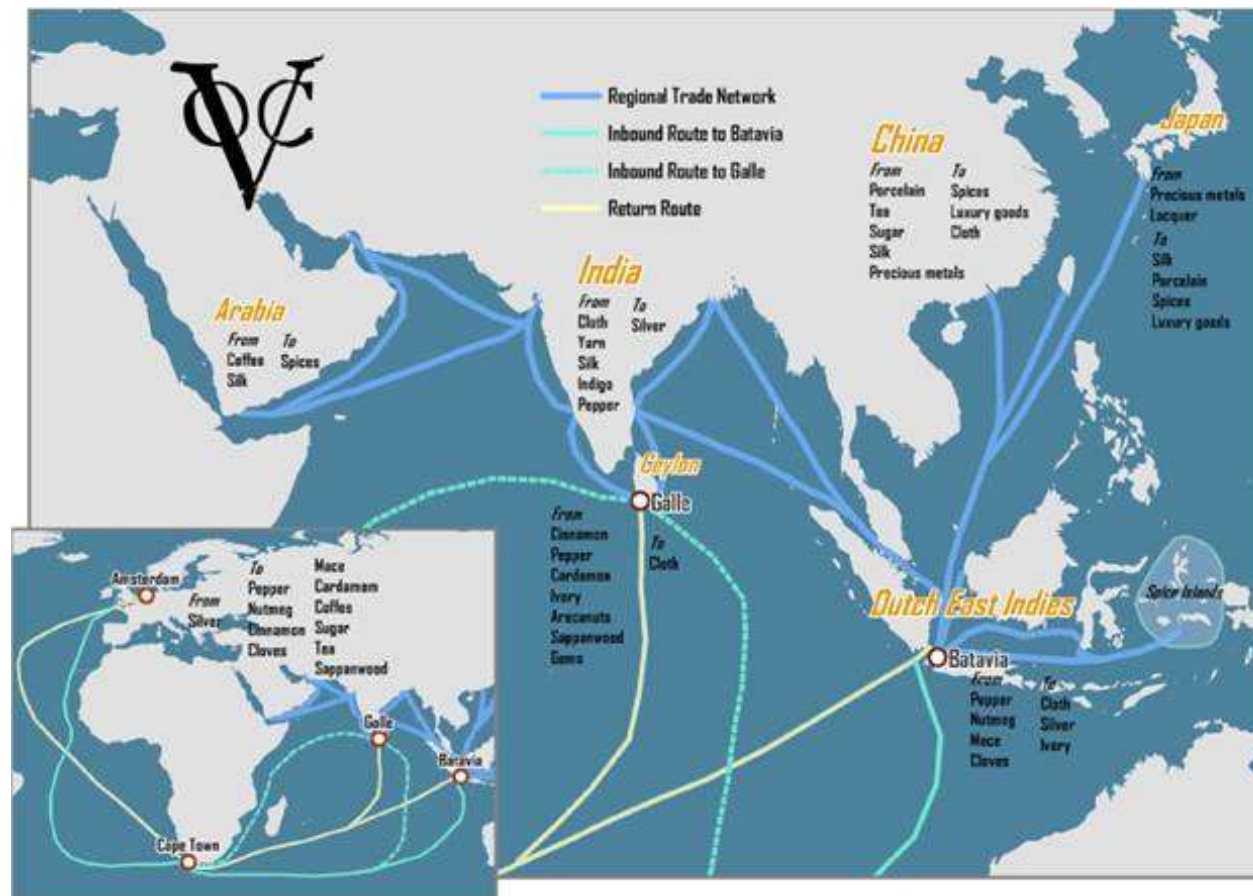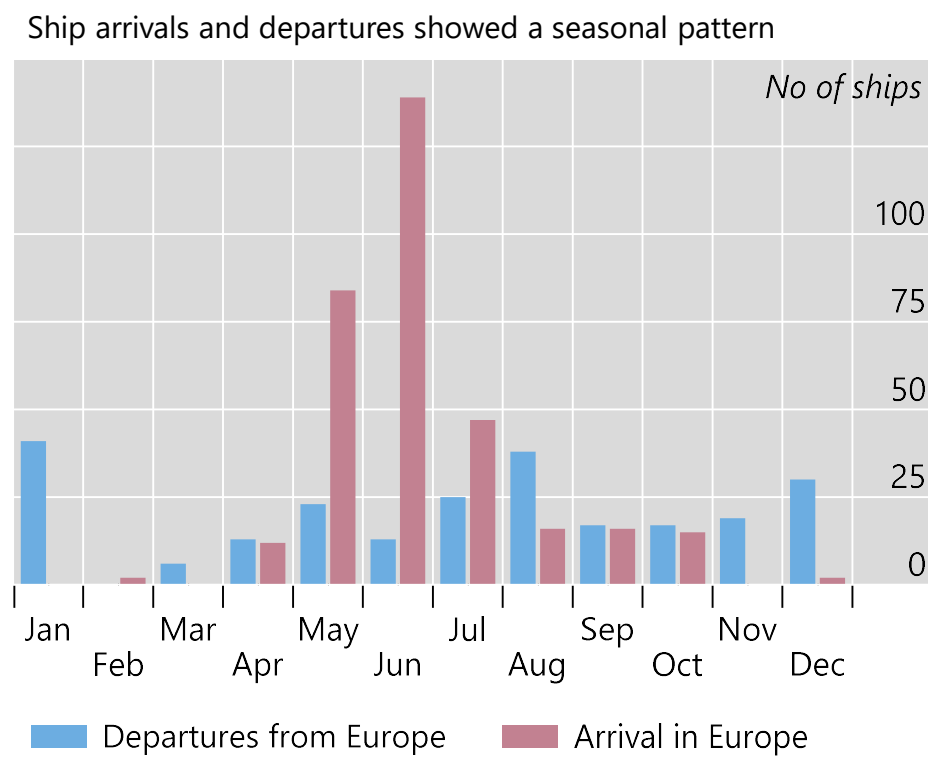Legend: Departures from Europe — Arrival in Europe

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Short-term lending operations

Ship arrivals and departures showed a seasonal pattern

No of ships

Departures from Europe   Arrival in Europe
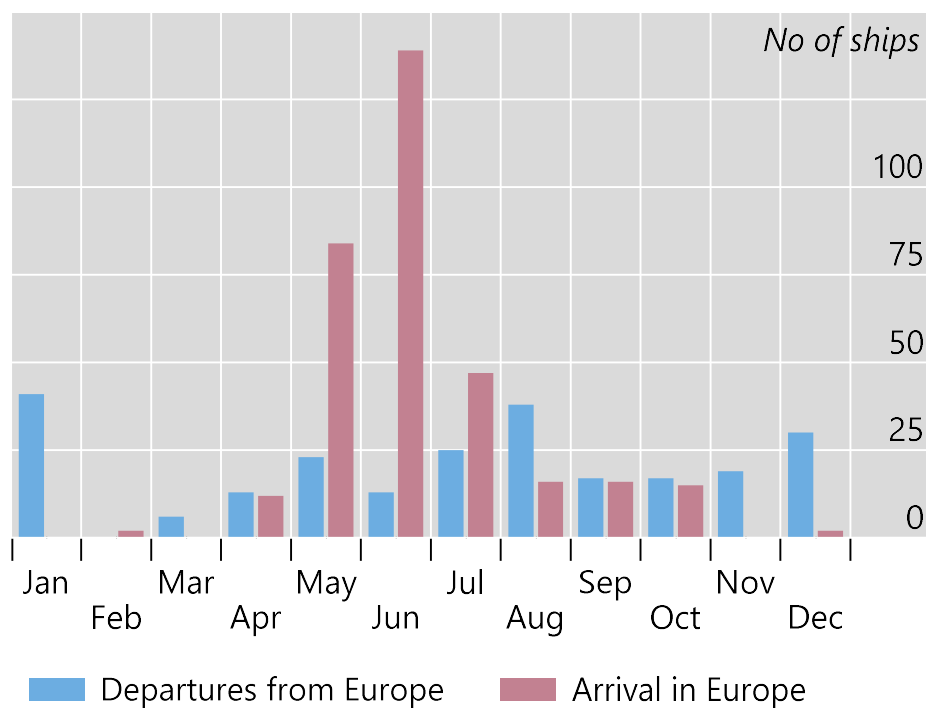
Credit to the VOC vs unencumbered accounts

$R^2 = 0.877$

Month-on-month changes in unencumbered accounts (millions of guilders)

Month-on-month change in Dutch East India Loans (millions of guilders)
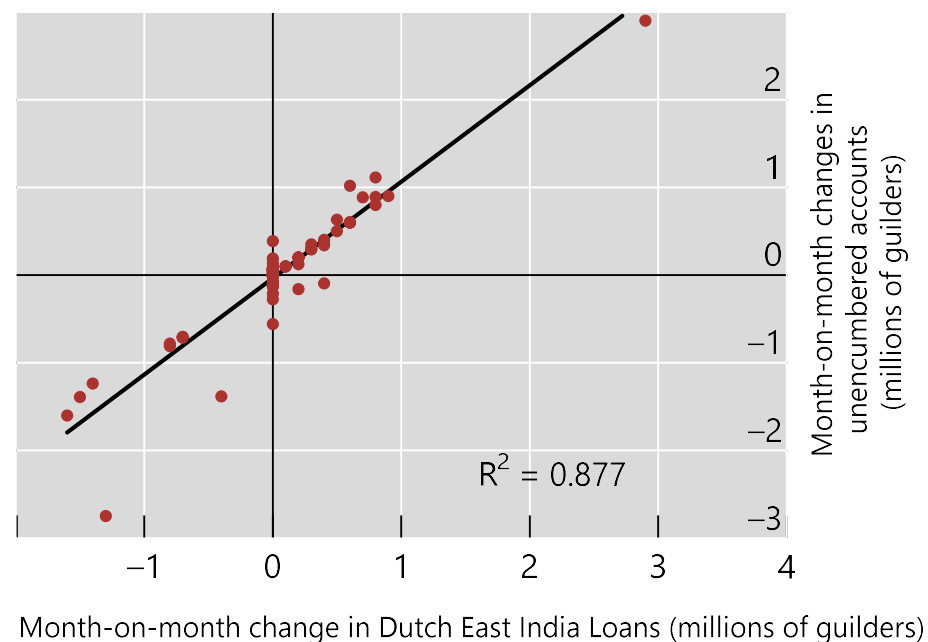
Peak daylight overdrafts on Fedwire
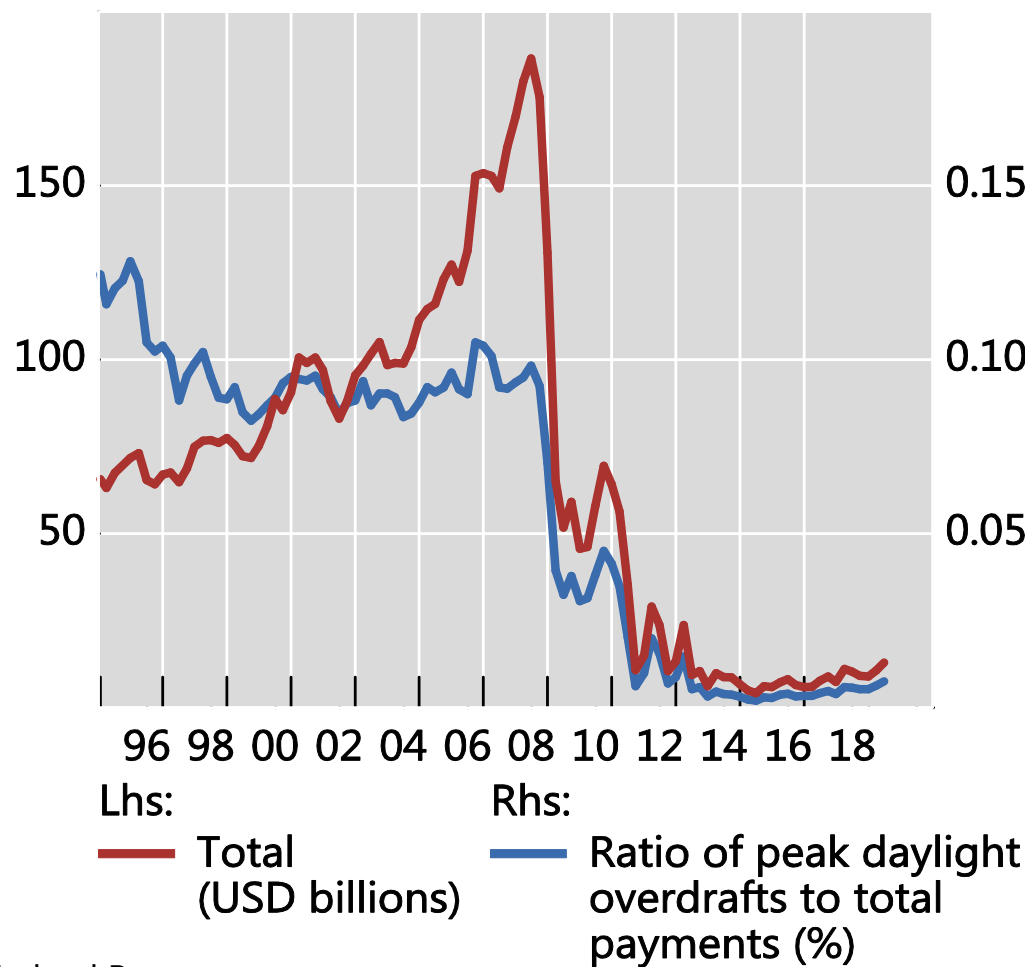
Source: Federal Reserve.
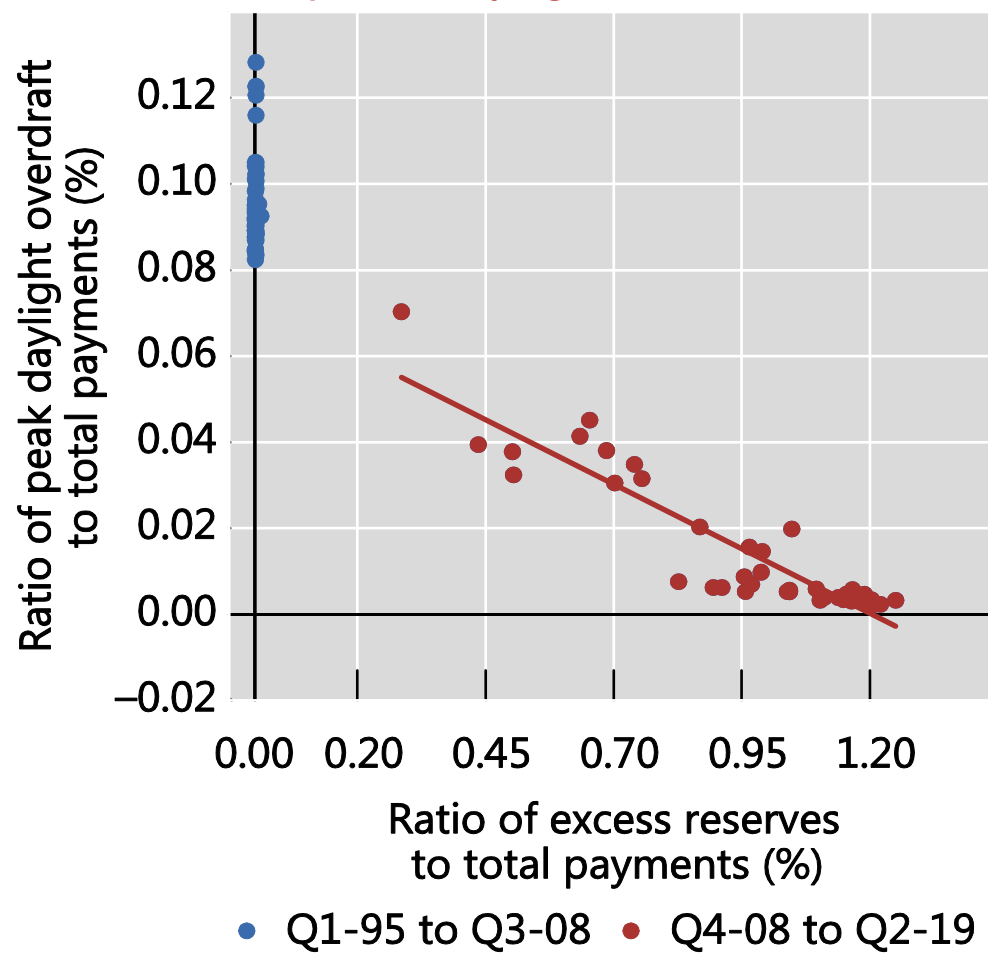
Excess reserves and peak daylight overdrafts

Source: Federal Reserve.

Excess reserves and peak daylight overdrafts

$y = 0.0722 - 0.06x$
where $R^2 = 0.841$

Ratio of peak daylight overdraft to total payments (%)

Ratio of excess reserves to total payments (%)

• Q1-95 to Q3-08   • Q4-08 to Q2-19
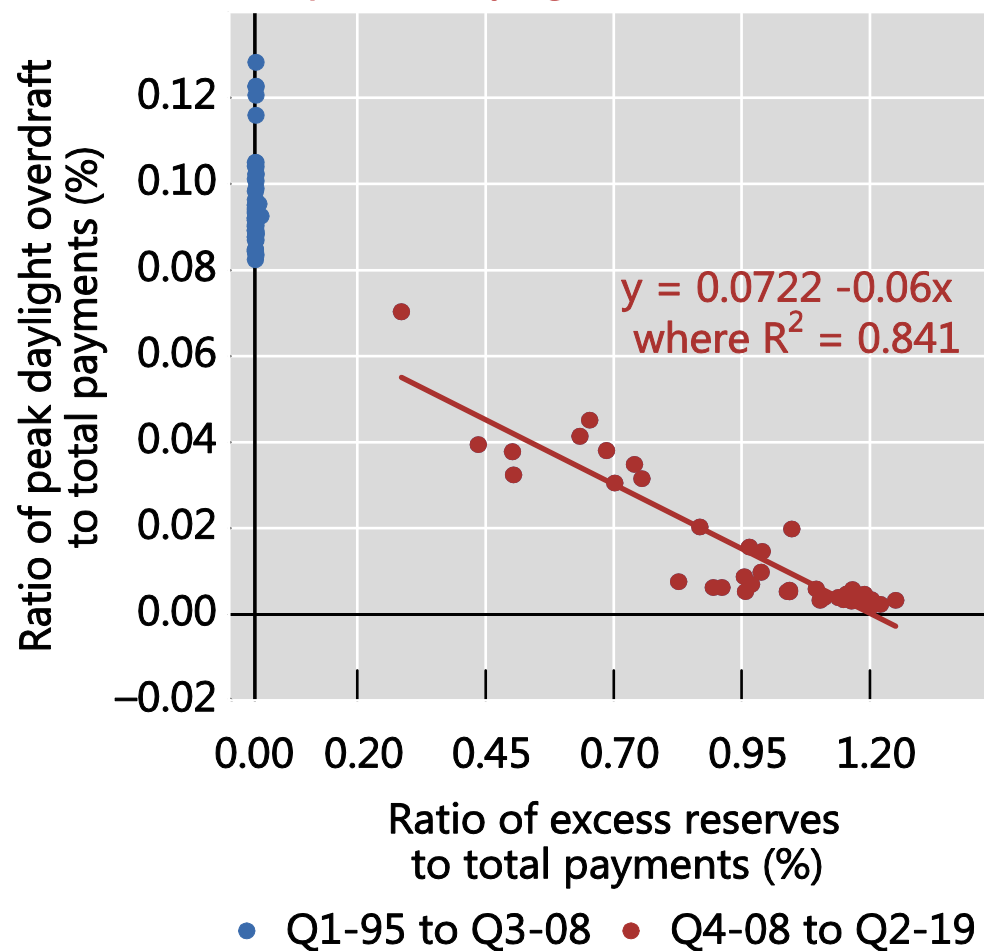
Source: Federal Reserve.

Payment profile during the day for large value payments
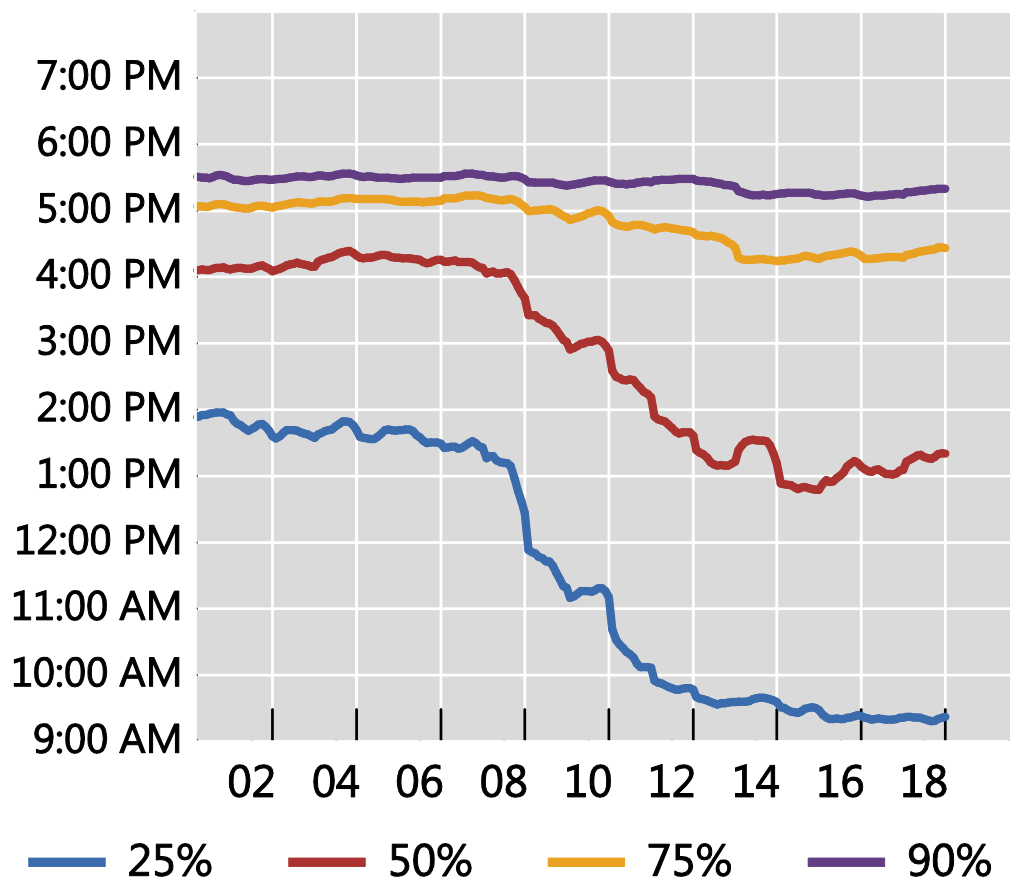
Source: Copeland, Molloy, and Tarascina, "What Can We Learn from the Timing of Interbank Payments?," Federal Reserve Bank of New York *Liberty Street Economics* (blog), 25 Feb 2019.

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Disaster strikes: the fourth Anglo-Dutch war

VOC shipping collapses

Shipping volumes of the Dutch East India Company

Lending operations

Millions of guilders

Legend:
- Total Of Balances
- Metal Stock
- Debt of The East India Company
- Debt of The Town Treasury
- Debt of The Loan Chamber
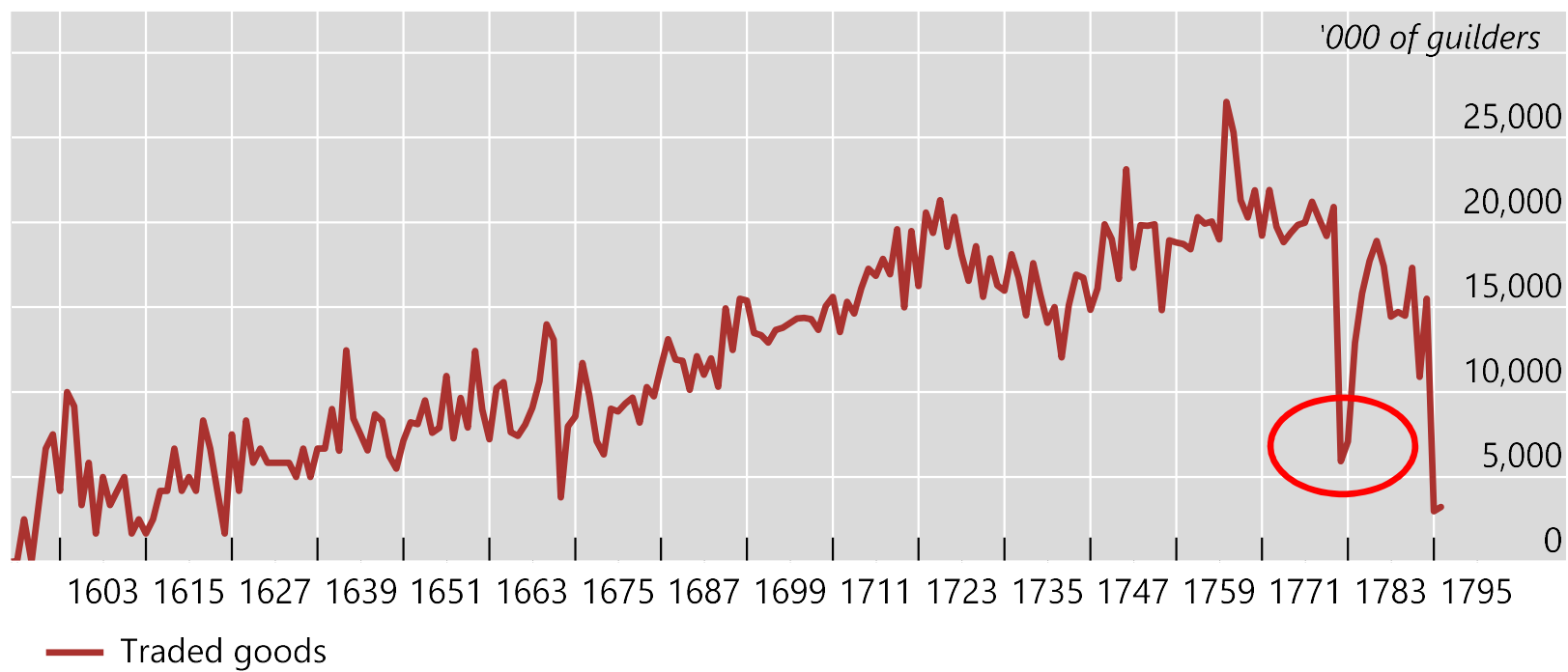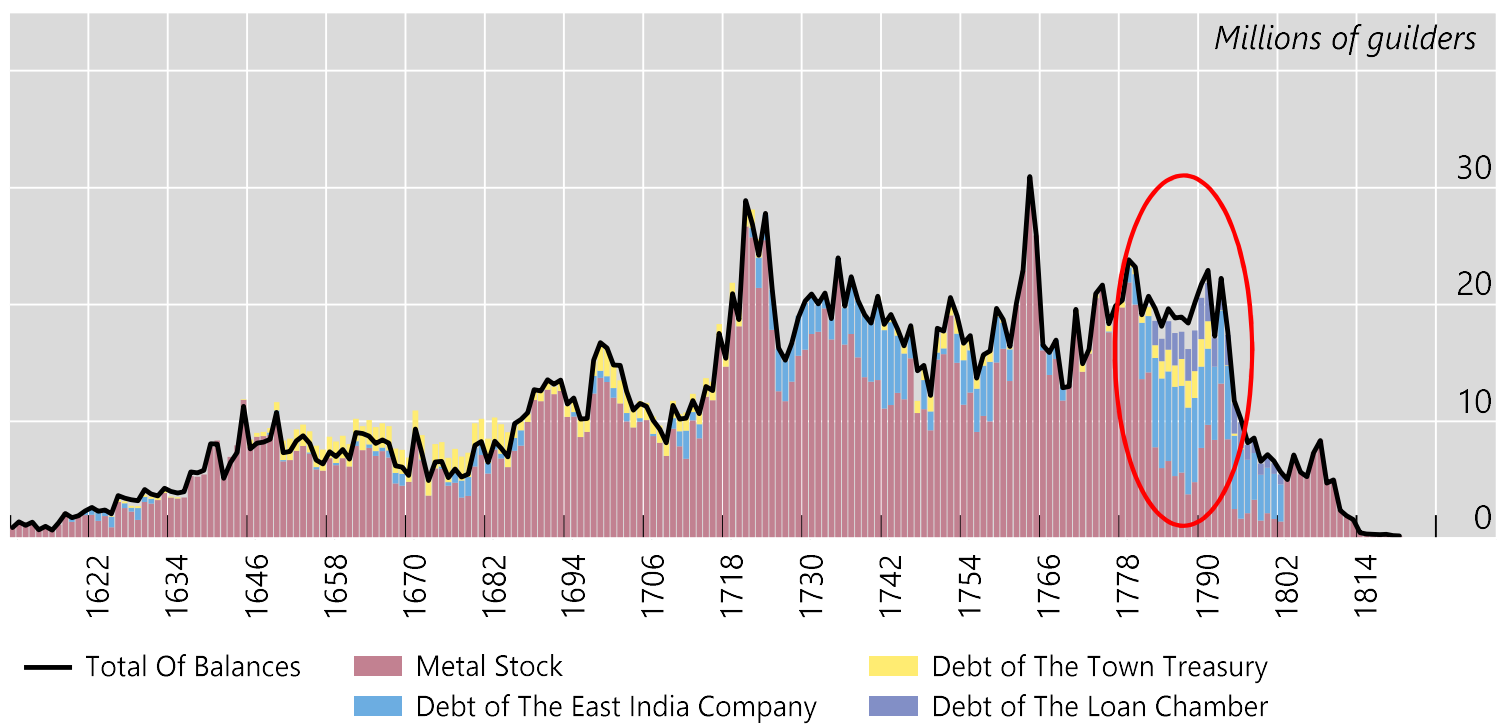
Adjusted equity is eroded
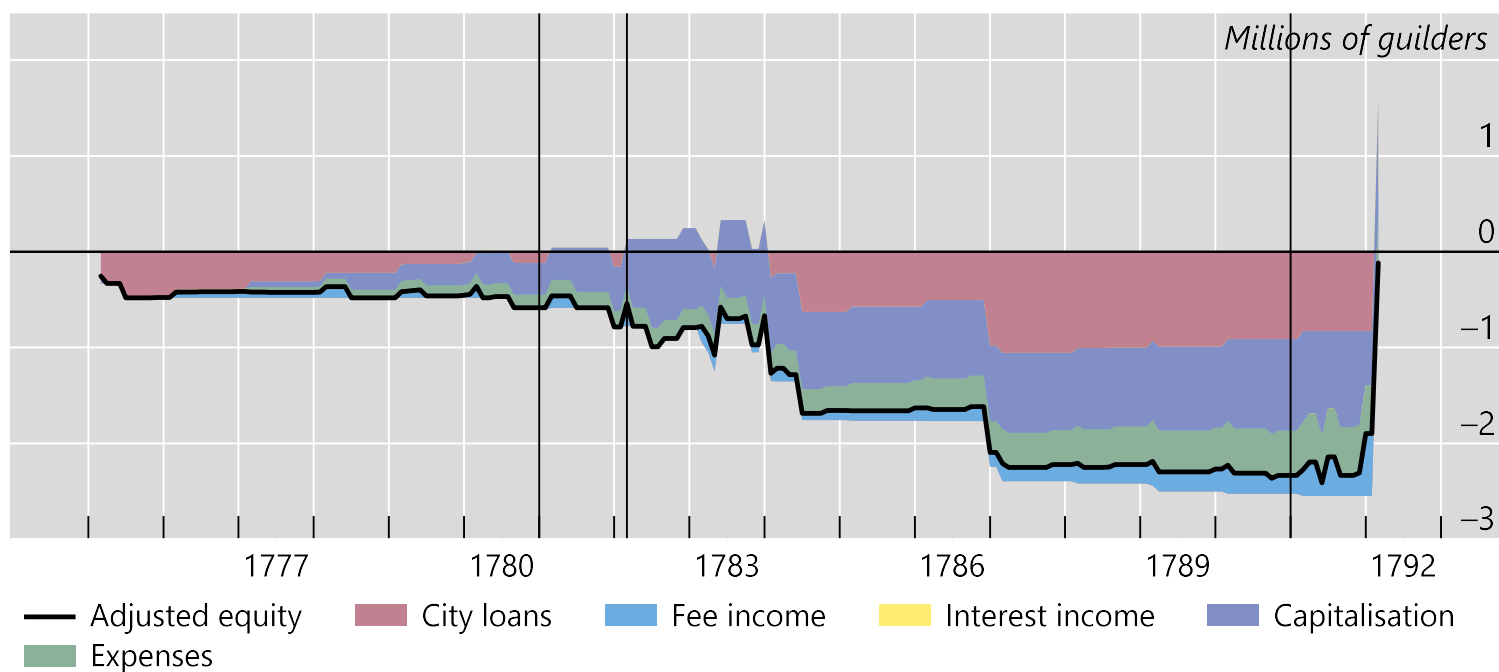
The vertical lines indicate 1780 (fourth Anglo-Dutch war breaks out), 1782 (bank steadily ramps up lending) and 1790 (Agio turns negative for the first time).

Loans supplant the metal stock on the asset side of the balance sheet
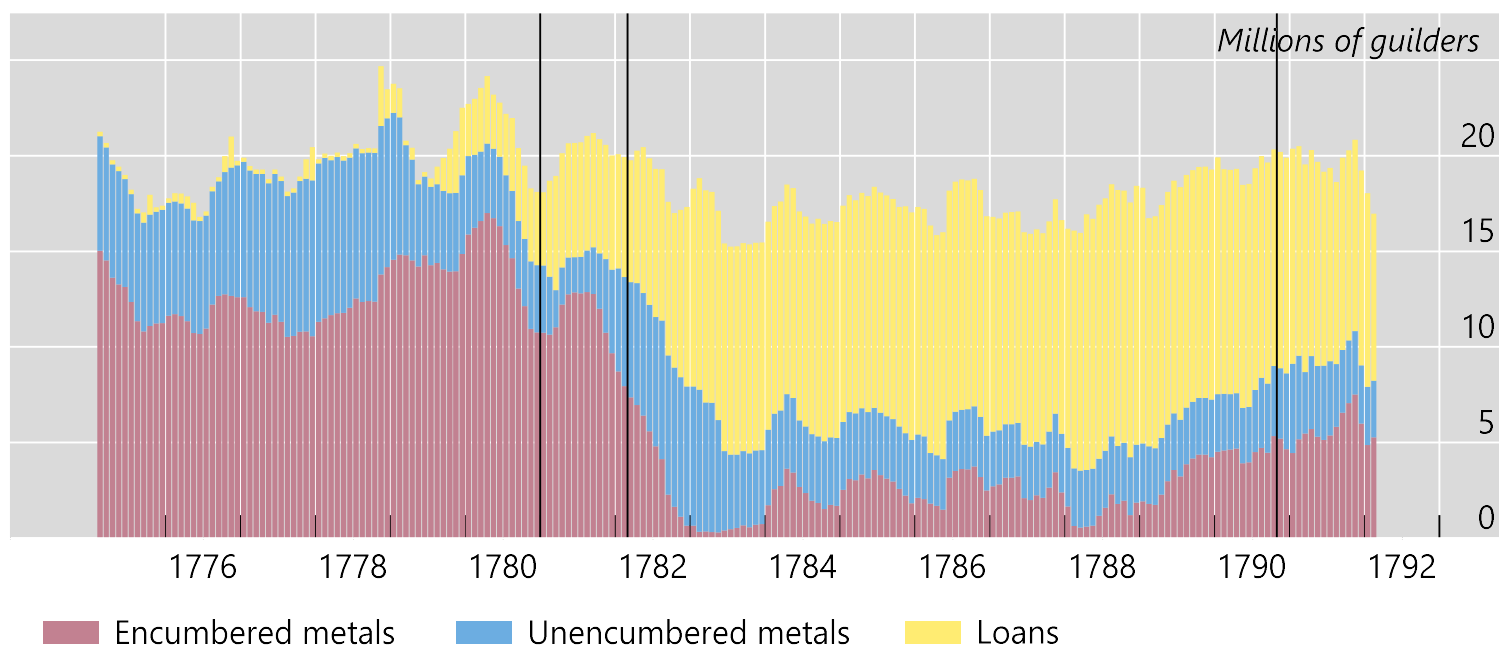
The vertical lines indicate 1780 (fourth Anglo-Dutch war breaks out), 1782 (bank steadily ramps up lending) and 1790 (Agio turns negative for the first time).

The agio starts to suffer

The vertical lines indicate 1780 (fourth Anglo-Dutch war breaks out), 1782 (bank steadily ramps up lending) and 1790 (Agio turns negative for the first time).

Monetary financing of credit takes hold

The Bank created and purchased coin to make up for falling receipts
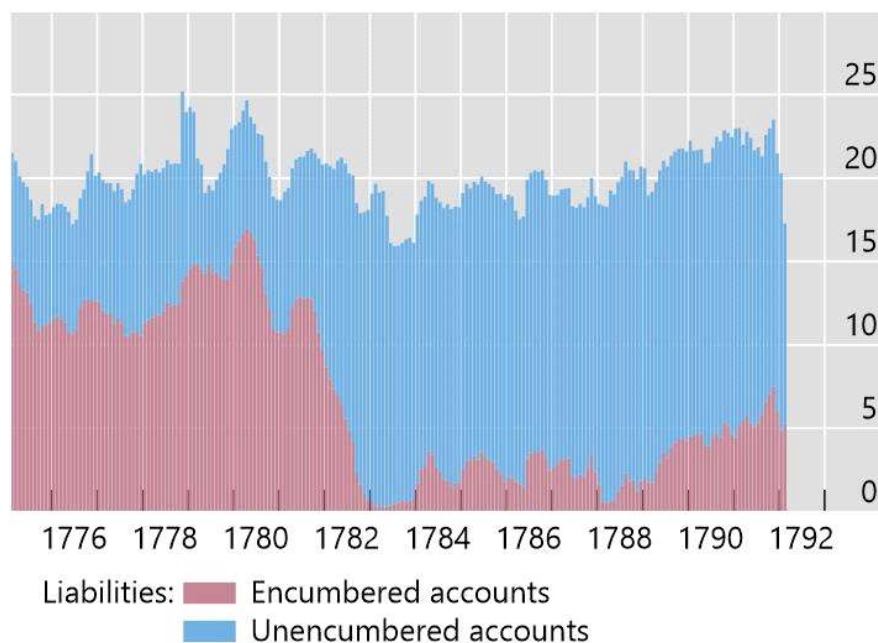
The two types of accounts substituted for one another

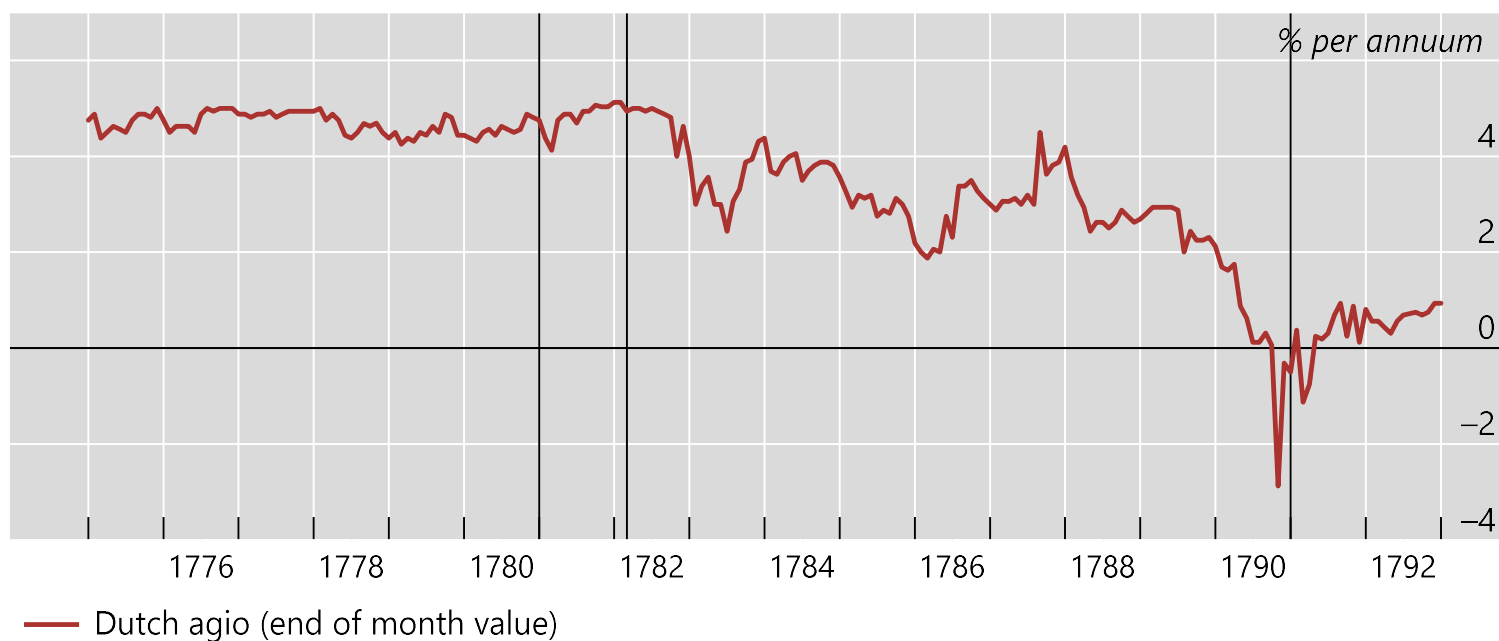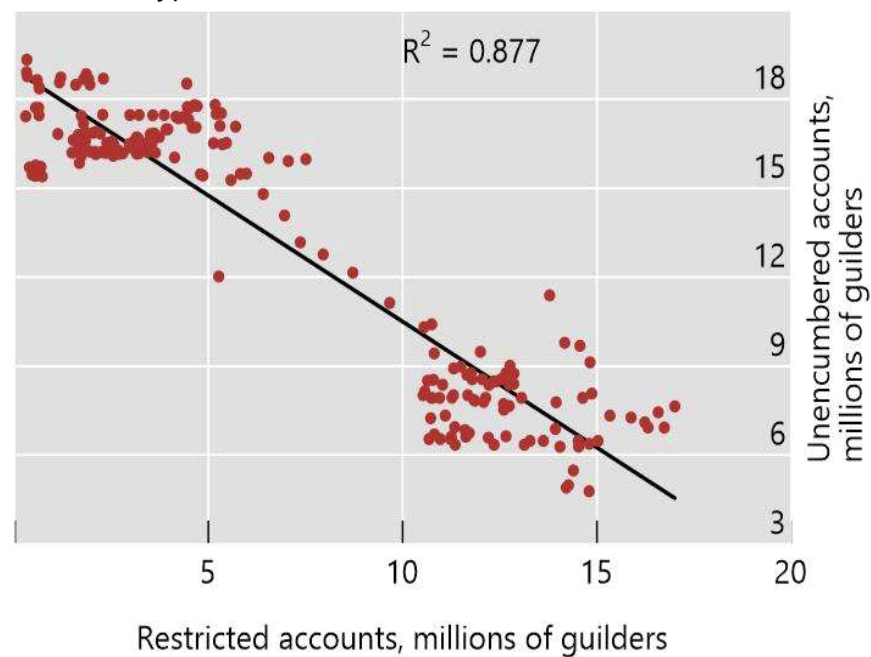# Downfall
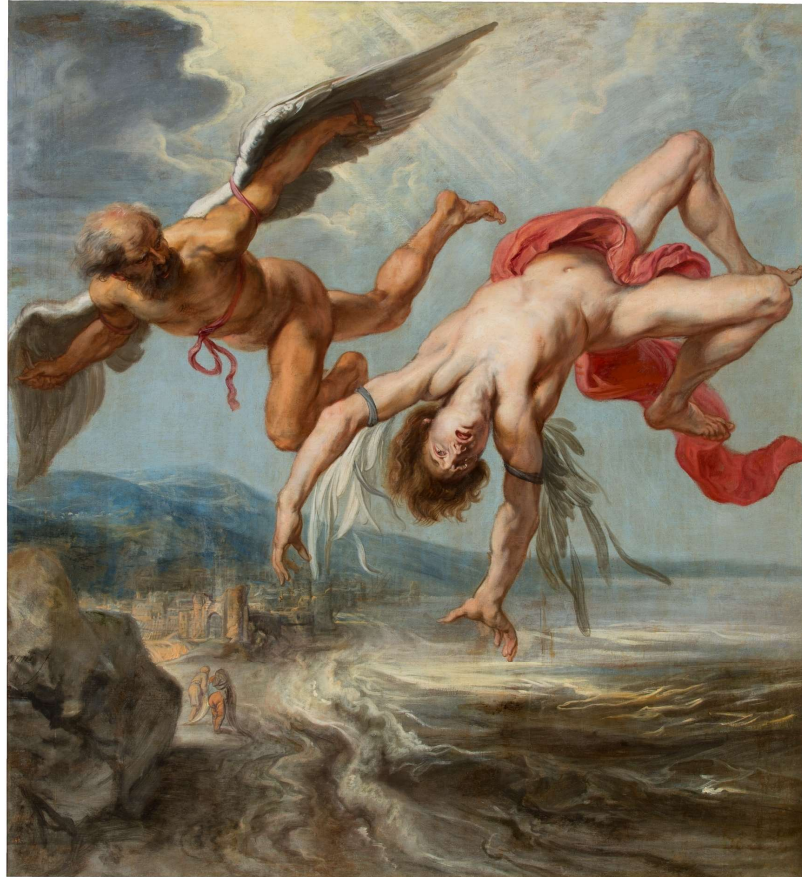
The Bank in 1776: deposits mostly backed by metal stock

Assets (in guilders)

Liabilities (in guilders)

1776

1783

1795

15,000,000   10,000,000   5,000,000

5,000,000   10,000,000   15,000,000

- Metal stock
- Debt of the Dutch East India Company
- Debt of the Town Treasury
- Debt of the Loan Chamber

- Accounts

Sources: van Dillen (1934).

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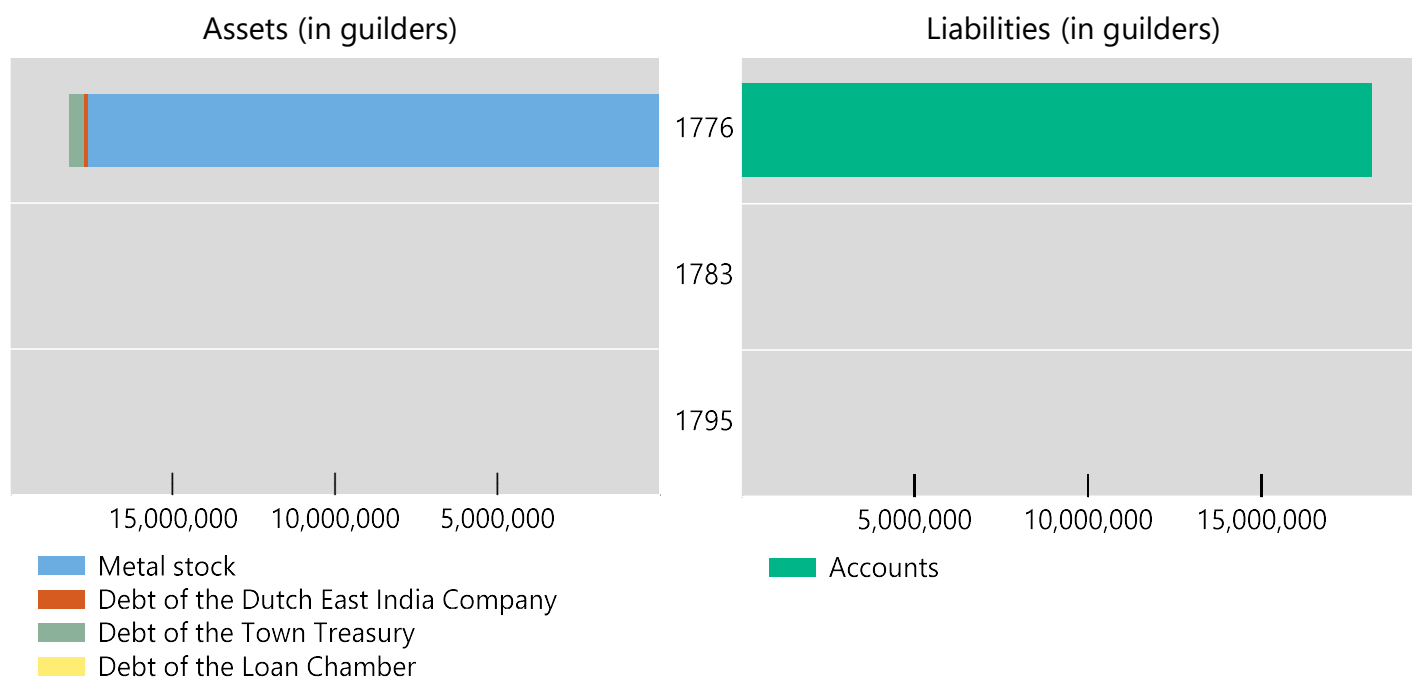
The Bank in 1783: lending to distressed (public) borrowers

Assets (in guilders)

	1776
	1783
	1795

15,000,000 10,000,000 5,000,000

- Metal stock
- Debt of the Dutch East India Company
- Debt of the Town Treasury
- Debt of the Loan Chamber

Liabilities (in guilders)

5,000,000 10,000,000 15,000,000

- Accounts
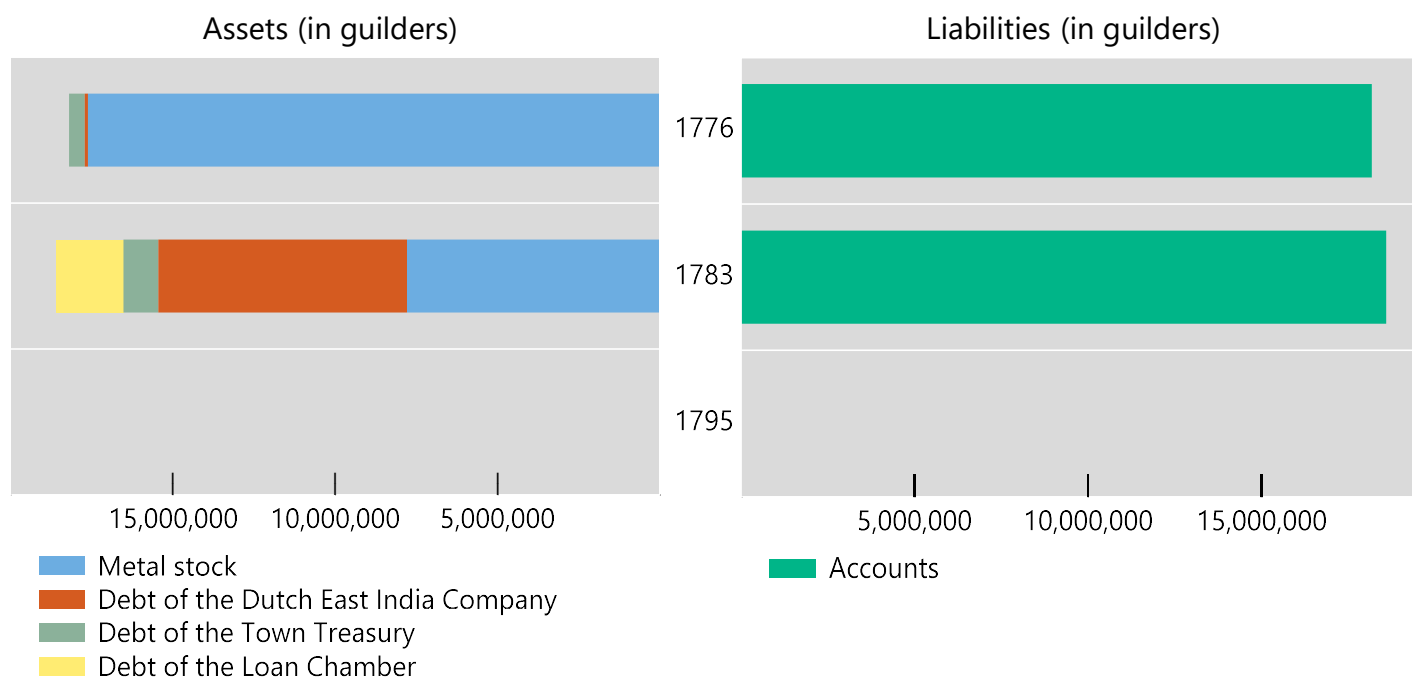
The Bank in 1795: redemptions and collapse

Assets (in guilders) — Liabilities (in guilders)

Legend:
- Metal stock
- Debt of the Dutch East India Company
- Debt of the Town Treasury
- Debt of the Loan Chamber
- Accounts
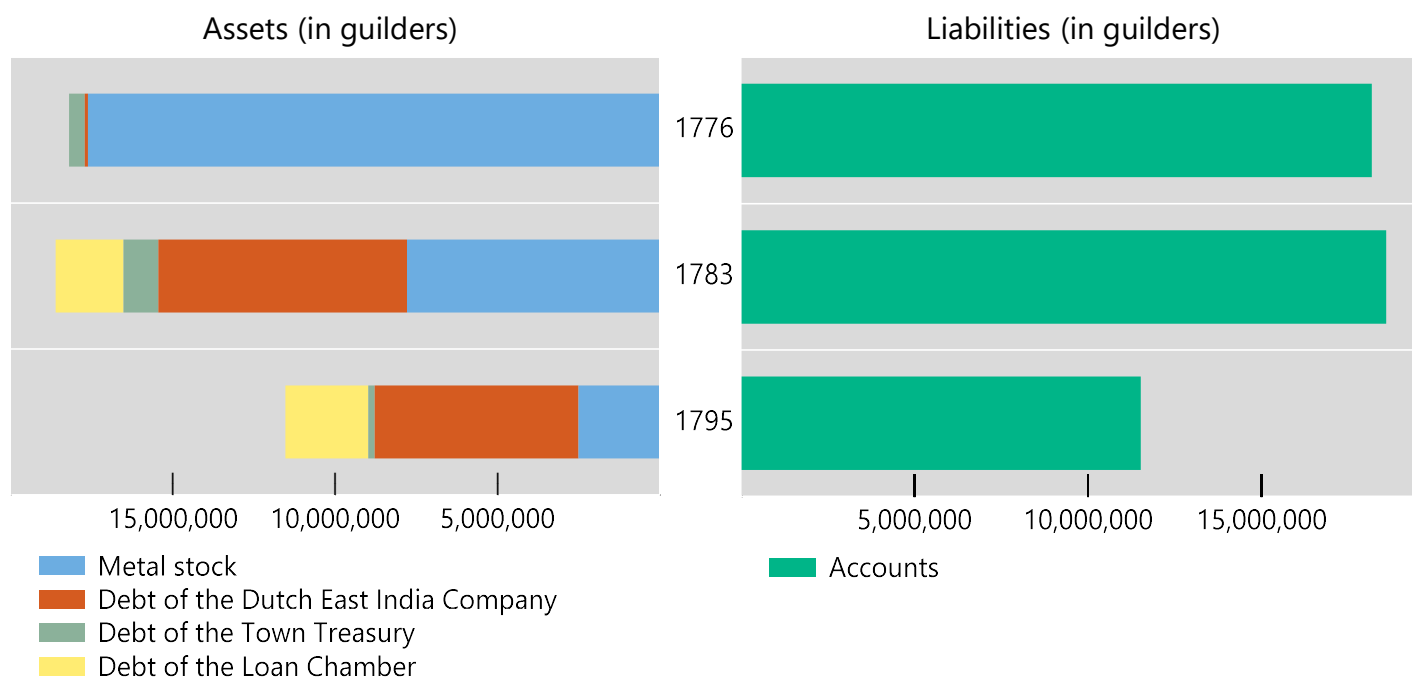
Sources: van Dillen (1934).

Agio erodes with lending

Regression results for long-term effects of loan share on agio   Table 1

Dependent variable	Agio		
	(1)	(2)	(3)
Loan share	−0.034***	−0.025***	
	(−11.0)	(−13.8)	
Loan share, lagged and instrumented[1]			−0.035**
			(−2.0)
Constant	0.048***	0.049***	-0.052***
	(32.0)	(56.8)	(7.7)
Dummy=1 for period after July 1789		−0.029***	−0.026***
		(−20.5)	(-6.9)
Estimation method	LSE	LSE	2SLS
Observations	205	205	107
R-squared	0.37	0.80	0.78
Test results for null hypothesis of unit root in the residuals	Not rejected; test statistic of − 1.2 versus −2.6 at 10% critical value	Rejected at 1%; test statistic of -4.0 versus −3.5 at 1% critical value	Rejected at 1%; test statistic of − 3.7 versus −3.5 at 1% critical value

T-values in parenthesis (and Z-values for the instrumented regression). ***/**/* denotes results significant at the 1/5/10% level. The sample period is Feb 1775–Dec 1792.

[1] The instrument variable for the loan share is the lagged value of monthly traded goods.

Source: Authors' elaboration.

Error correction model

Regression results for short-run adjustment dynamics

Table 2

Dependent variable	Agio first differences		
	(1)	(2)	(3)
Error correction term		−0.17***	−0.17***
		(−3.1)	(−3.0)
Agio, first difference,	−0.36***	−0.28***	−0.29***
Lagged	(−5.6)	(−4.6)	(−4.8)
Loan share, first	−0.19*	−0.014	−0.012
difference, lagged	(−1.7)	(−1.3)	(−1.2)
Loan share*dummy1784,			−0.011***
first difference, lagged			(−4.3)
Estimation method	LSE, robust SE	LSE, robust SE	LSE, robust SE
Observations	204	204	204
R-squared	0.14	0.21	0.22

T-values in parenthesis (and Z-values for the instrumented regression). ***/**/* denotes results significant at the 1/5/10% level. The sample period is Feb 1775–Dec 1792.

[1] The instrument variable for the loan share is the lagged value of monthly traded goods.

Source: Authors' elaboration.

Governance and settlement liquidity

- If stablecoins stick to their governance rules, they provide limited settlement liquidity

- If stablecoins do <u>not</u> stick to their governance rules, that will be problematic in itself (eg, Bank of Amsterdam)

Lessons for the digital era

- Two key lessons for today:
    1. Rigid stablecoins are poorly suited as the foundation for a modern monetary system. If they stick to their governance rules (i.e. full backing), they provide limited settlement or lender of last resort liquidity. If they do not stick to their governance rules, they may be enticed to expand lending over time.
    2. Institutions with a strong reputation can use their room for manoeuvre up to a point, but there may be a breaking point. When the scale of losses is large and fiscal backing is limited, it is possible for an issuer of money to fail.
- While technology changes, the governance of money remains crucial.
- To allow for elastic credit provision and sound fiscal backing, countries around the world have central banks who can issue sovereign fiat currency

Conclusions

- Concept of stablecoins is not new
- The Bank of Amsterdam and bank guilder worked well for a long period of time, but the "halfway house" between a rigid stablecoin and a modern central bank was untenable
- Today's stablecoins may support important specific use cases, but poorly suited as the foundation for a wholesale payment system
- Just as this historic stablecoin gave way to a modern central bank, could modern stablecoins give way to CBDCs?
- Through the ages, the governance of money is key