

Foreshadowing LTCM: The Crisis of 1763

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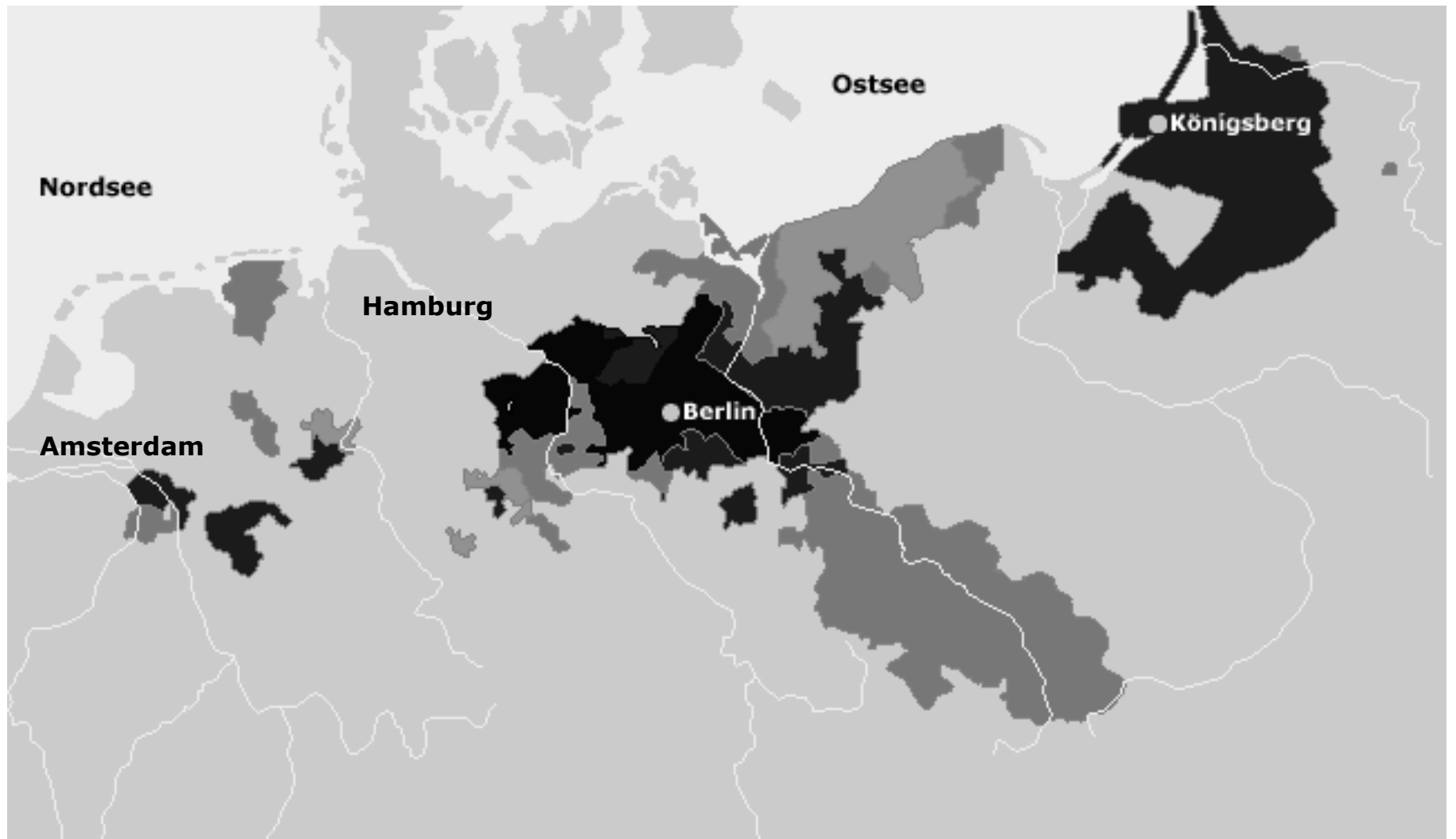
London School of Economics



1763 Crisis

Background

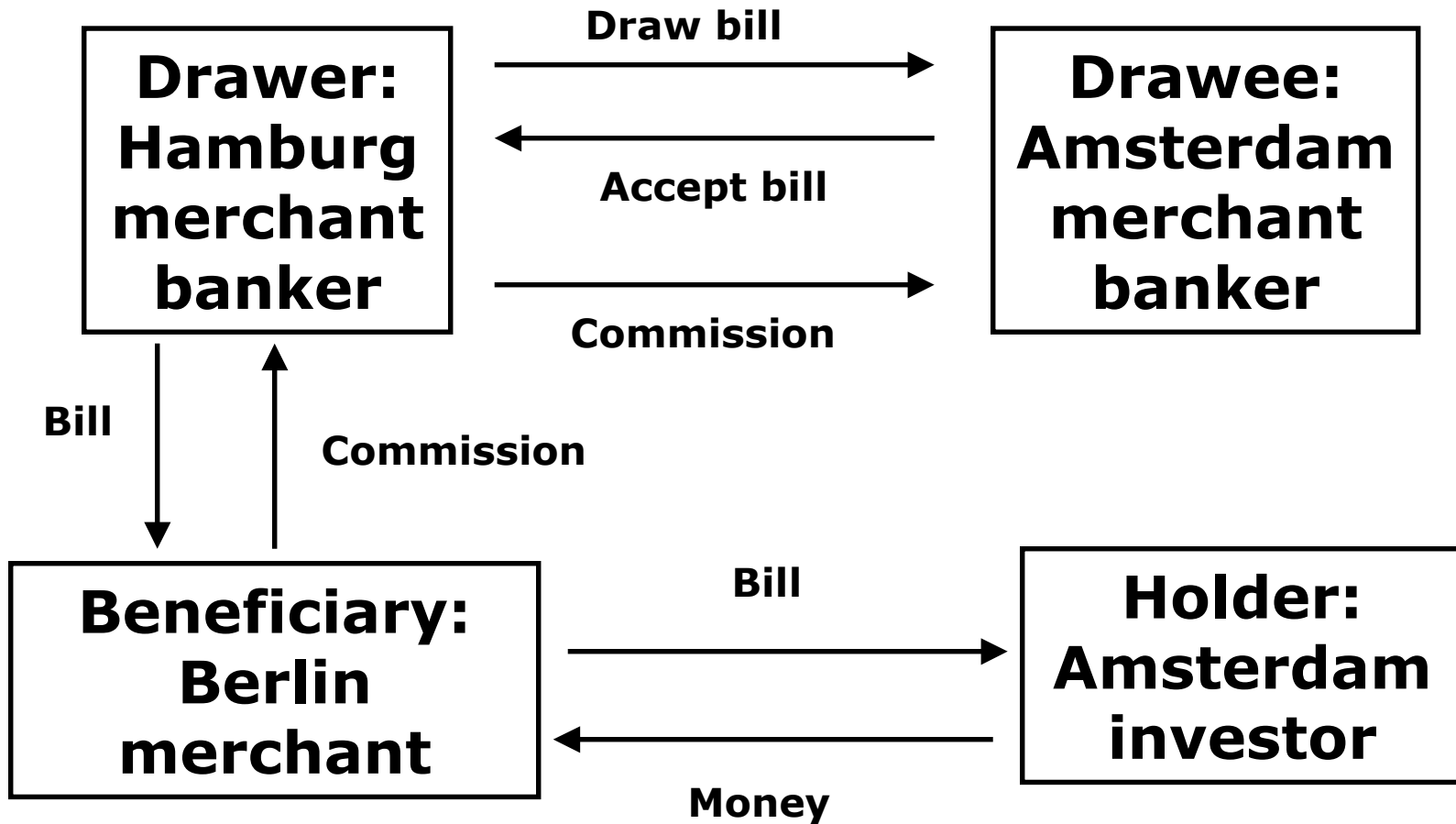
- Prussia, “emerging market”
 - Scarcity of capital
 - Underdeveloped financial market
 - Seven years war
- Amsterdam,
 - Accumulated wealth
 - Sophisticated financial system: Bank of Amsterdam, organized exchanges



How can credit be channeled from Amsterdam to Berlin?

- Commitment/enforcement
- Collateral
- Banks were “merchant banks”, rather than modern, deposit-funded banks

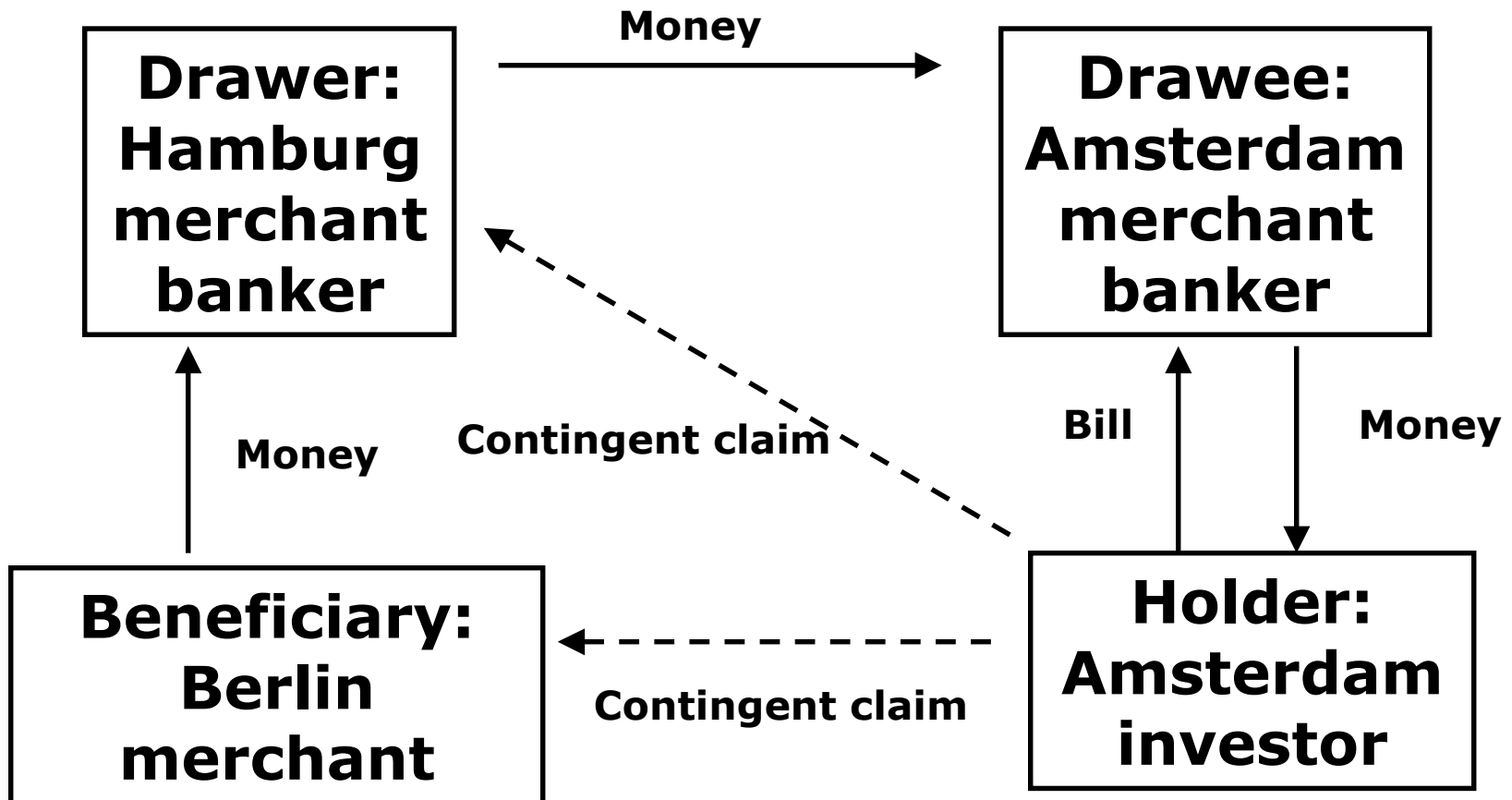
Bills of exchange and "acceptance loans"



Bills of Exchange

- Bill is “order to pay”, rather than “promise to pay”.
- Enable string of interconnected obligations that mimic loan from Amsterdam to Berlin
 - Commitment
 - Collateral

Acceptance Loans (at maturity)



Negotiability of Bills

- *Endorsement*: Selling within credit insurance wrapper
- "*Holder in due course*": separation of bill from underlying transaction
- Economic rationale: payoffs insensitive across states
 - Prevent passing of bad bills
 - Constant payoffs across states, bills as inside money

Negotiability of bills

- Expand the universe of feasible contracts by binding in diverse interested parties
 - Emergence of bill-like instruments (*Veksels*) in 1990s Russia
- ...but dark side
 - web of obligations increases externalities across interested parties

Balance Sheets

Hamburg merchant banker (drawer)

A	L
+ Claim on Berlin merchant	+ Liability towards Amsterdam banker
	+ <i>Contingent liability towards bill holder</i>

Amsterdam merchant banker (drawee)

A	L
+ Acceptance loan to Hamburg banker	+ Acceptance liability towards bill holder

Berlin merchant (beneficiary)

A	L
+ Bill - Bill + Cash	+ Liability towards Hamburg banker
	+ <i>Contingent liability towards bill holder</i>

Amsterdam investor

A	L
+ Bill - Cash	

Seven Years War (1756-1763)

- Two separate wars...
- War conjuncture in manufacturing and trade
- Expansion of credit through bills of exchange
- Speculation in war goods and exotic goods

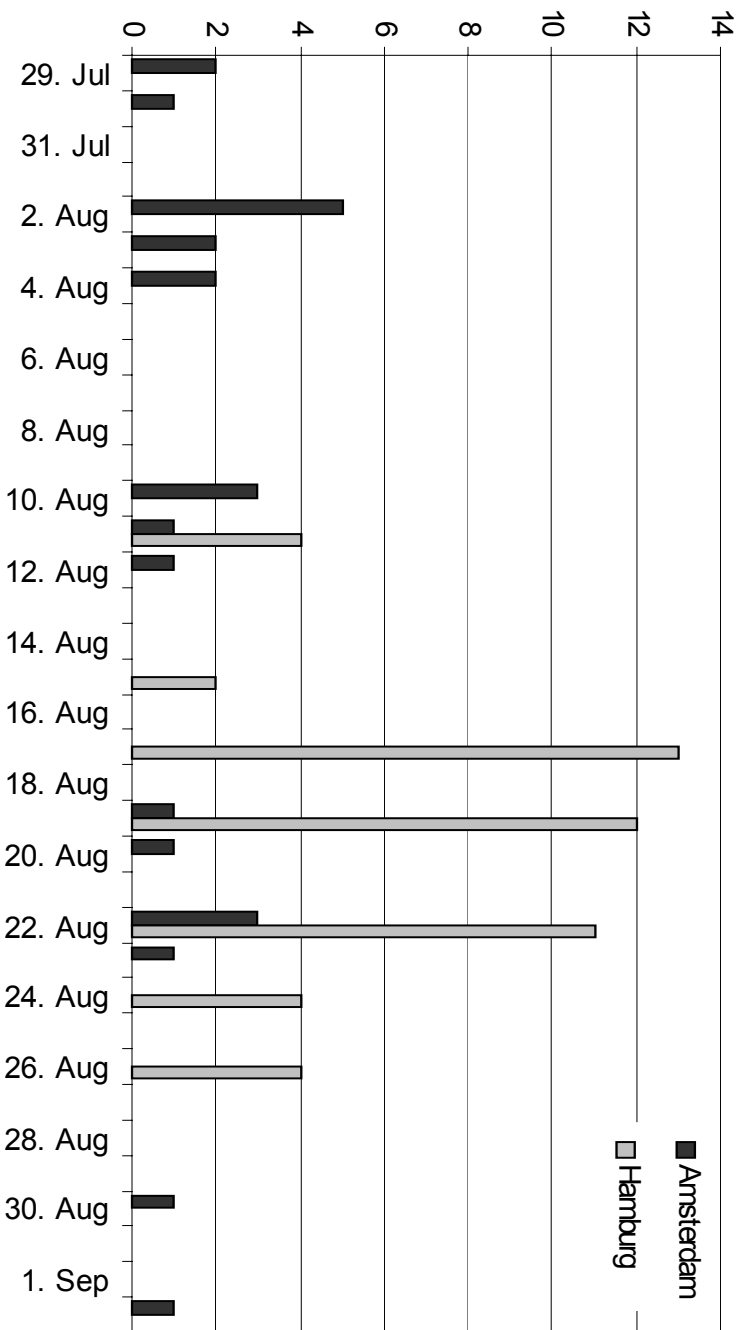
Rise of de Neufville Brothers

“[succeeded against their competitors] by extending loans in a particularly broad-minded way ... Again and again they maintained their pre-dominance by inventing methods that were at first considered revolutionary, but soon imitated by other merchants”

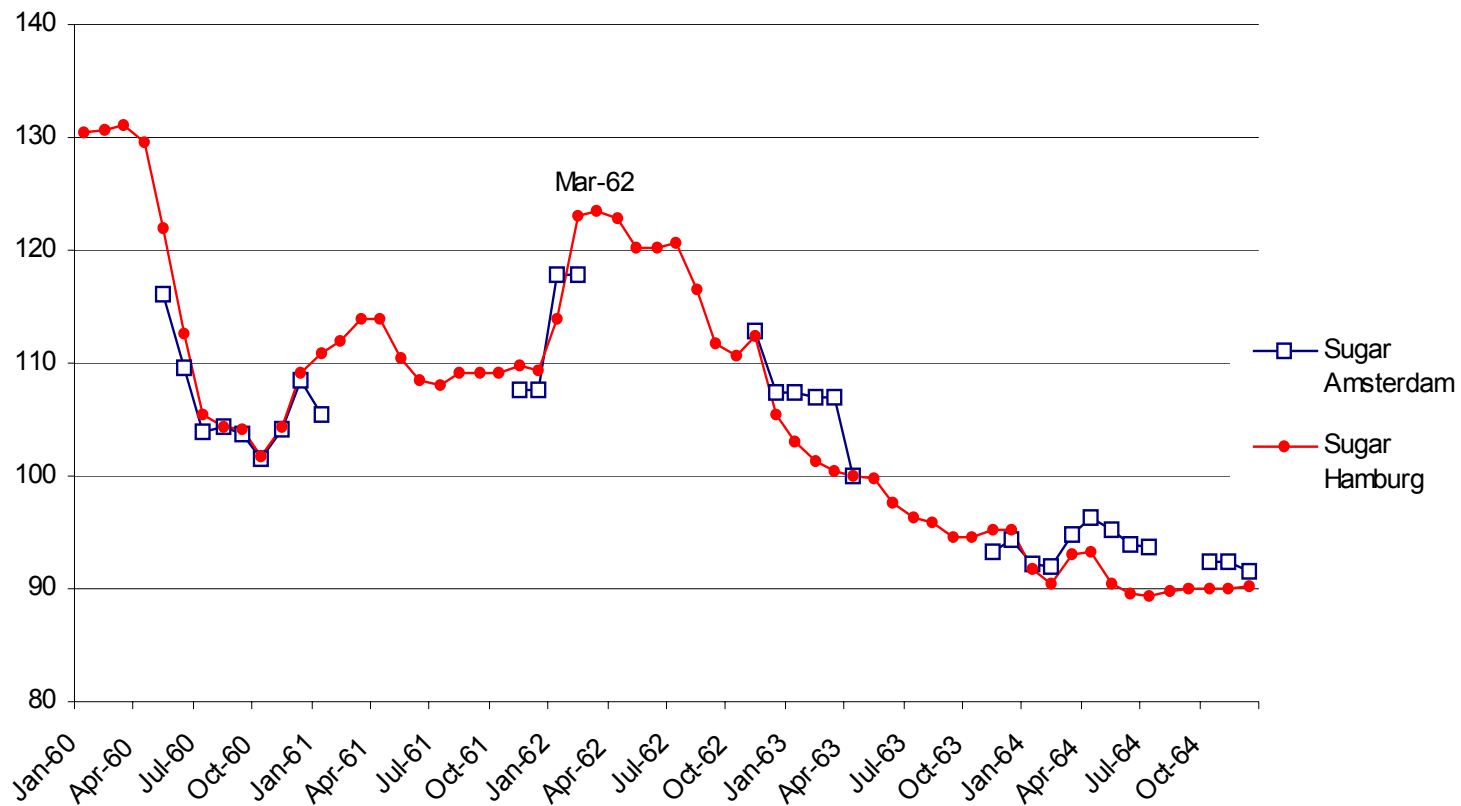
Stylized Facts

- Sequence of failures
- Many failed banks reopened their doors
- Decline of prices
- Increased correlations in returns

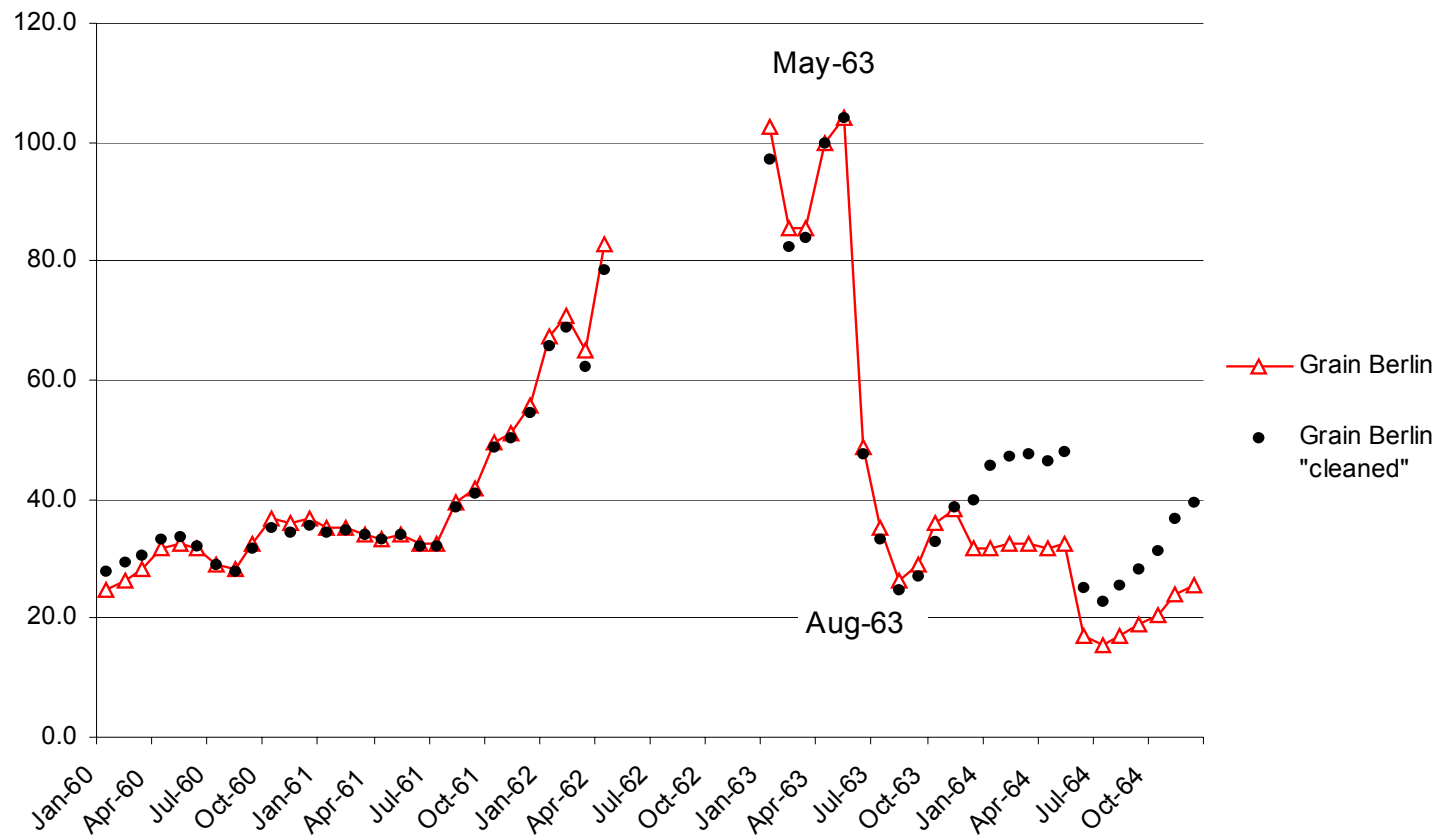
Sequences of failures



Sugar Prices



Berlin Grain Price



Chronology

- February 1763: Peace of Hubertusburg
- Price declines in exotic and war goods before conclusion of peace
- Evidence of distressed selling in summer 1763
- “Asset side contagion”

Failures

- 30 July 1763: de Neufville fails
 - Private attempts to rescue unsuccessful
 - Accord \approx 10%
- August/Sept: full-blown crisis
 - Waves of bank failures in Amsterdam, Hamburg, Berlin, Stockholm
 - Large number of failures
 - Many reopened their doors

- Counterparty risk correlated with credit risk
(aggregate risk)

- Asset side contagion
(liquidity risk)

Stylized Model

- After BM's liquidation of project, but before repayment

	AMB	HMB	BM
Sugar	1	0	0
Grain	L_A	L_H	L_B
Cash	0	0	F
Debt	-F	0	-F

■ Fundamental values (independent)

- Sugar: θ
- Grain: x

■ But finite elasticity of residual demand

$$p = xe^{-\lambda L} \leq x$$

- AMB has an additional loan (F) to fund sugar position

- Just prior to maturity:
 - HMB, BM pay their debts as scheduled
 - But AMB uses these funds to repay sugar debt

Distress Sales

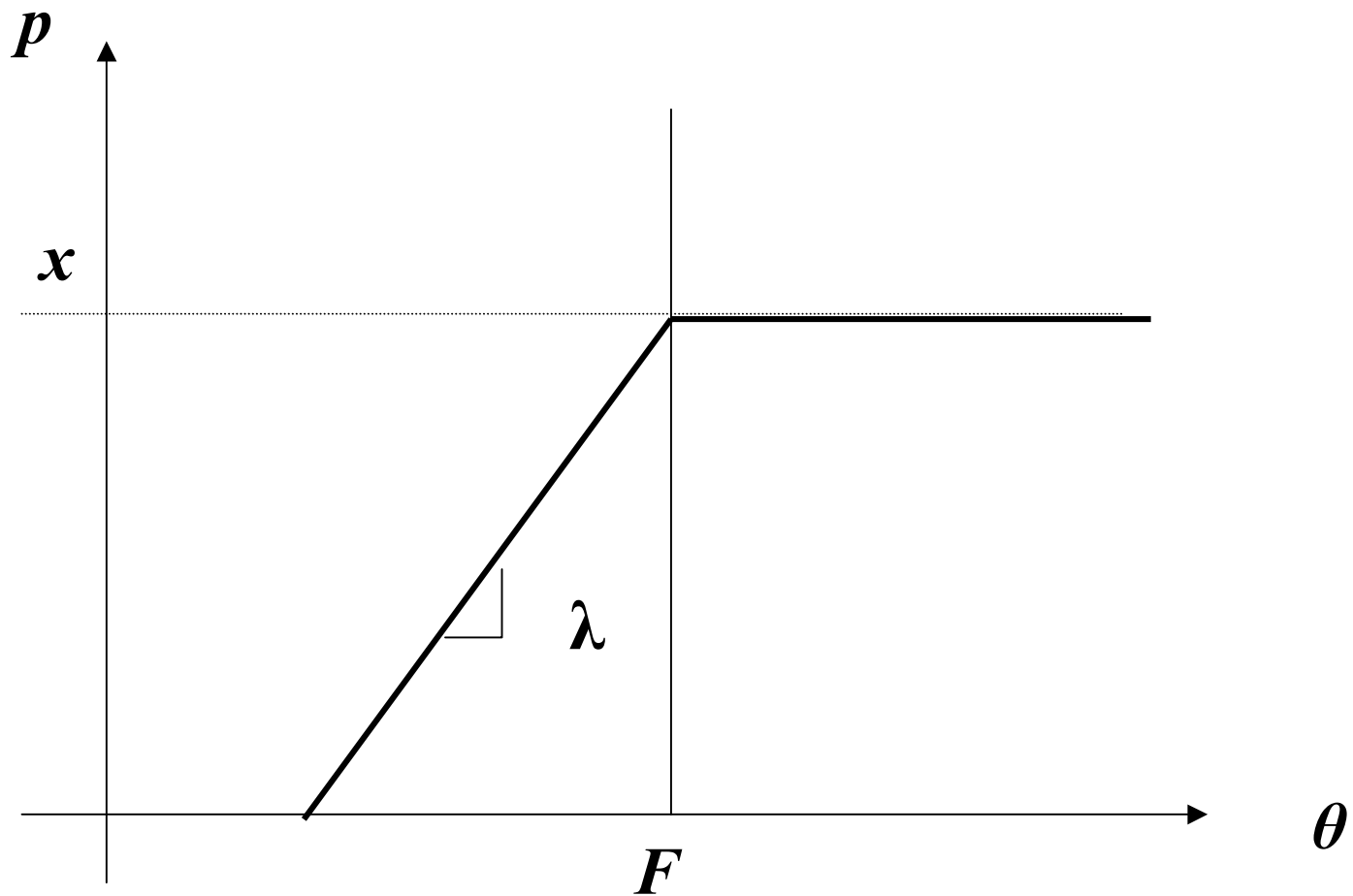
- AMB sells sugar to redeem the bill
- If $\theta < F$, AMB forced to sell grain (L):

$$L = \frac{1}{\lambda} \log\left(\frac{x}{x - \lambda S}\right)$$

- Resulting price of grain:

$$p = \begin{cases} x & \text{if } \theta \geq F \\ x - \lambda(F - \theta) & \text{if } \theta < F \end{cases}$$

Correlation of Prices



Cascading of Failures

- AMB is solvent IFF

$$F - \theta \leq x \left(\frac{1 - e^{-\lambda L_A}}{\lambda} \right)$$

- If AMB is insolvent, HMB becomes liable

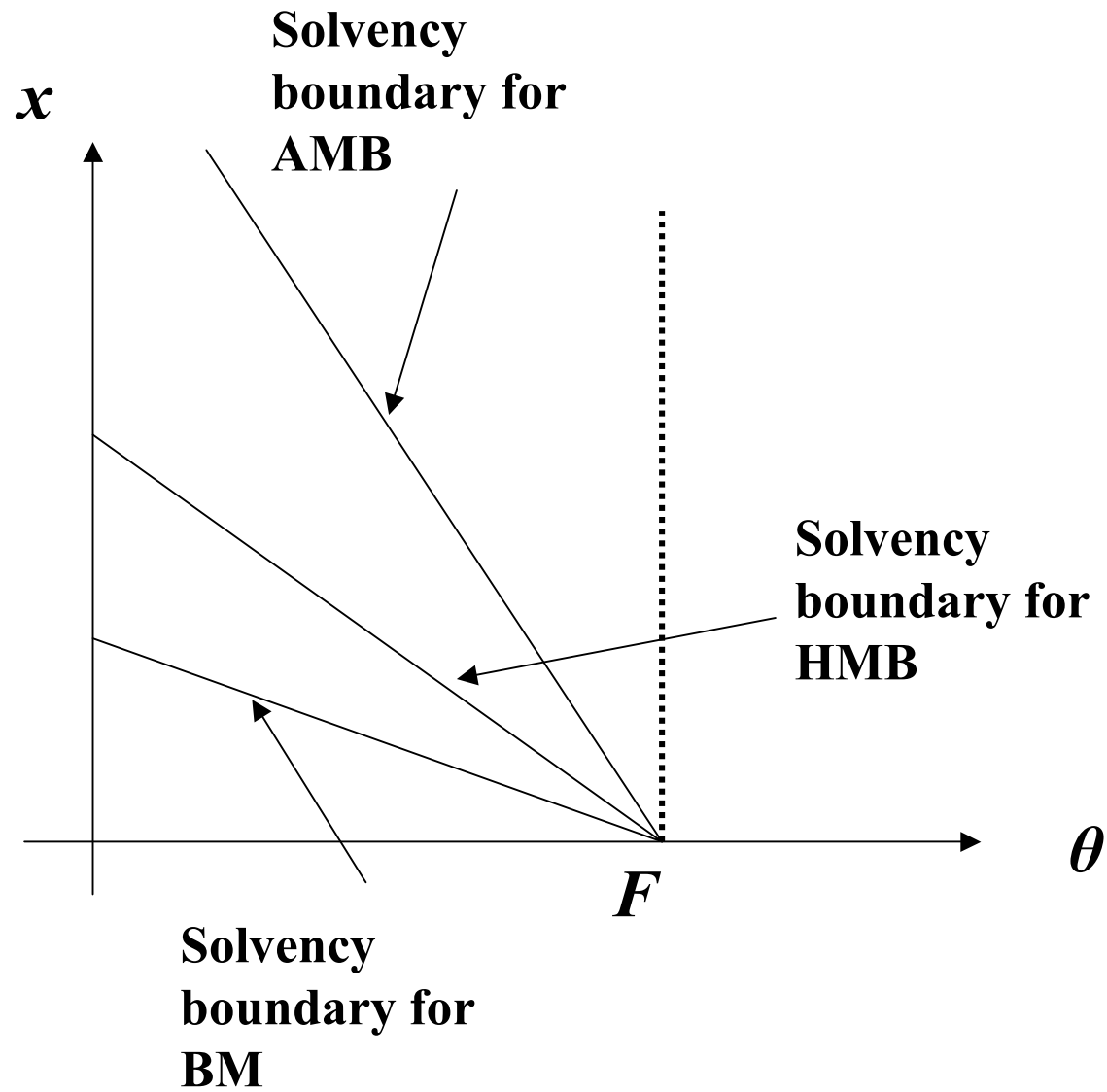
- HMB is solvent IFF

$$F - \theta \leq x \left(\frac{1 - e^{-\lambda(L_A + L_H)}}{\lambda} \right)$$

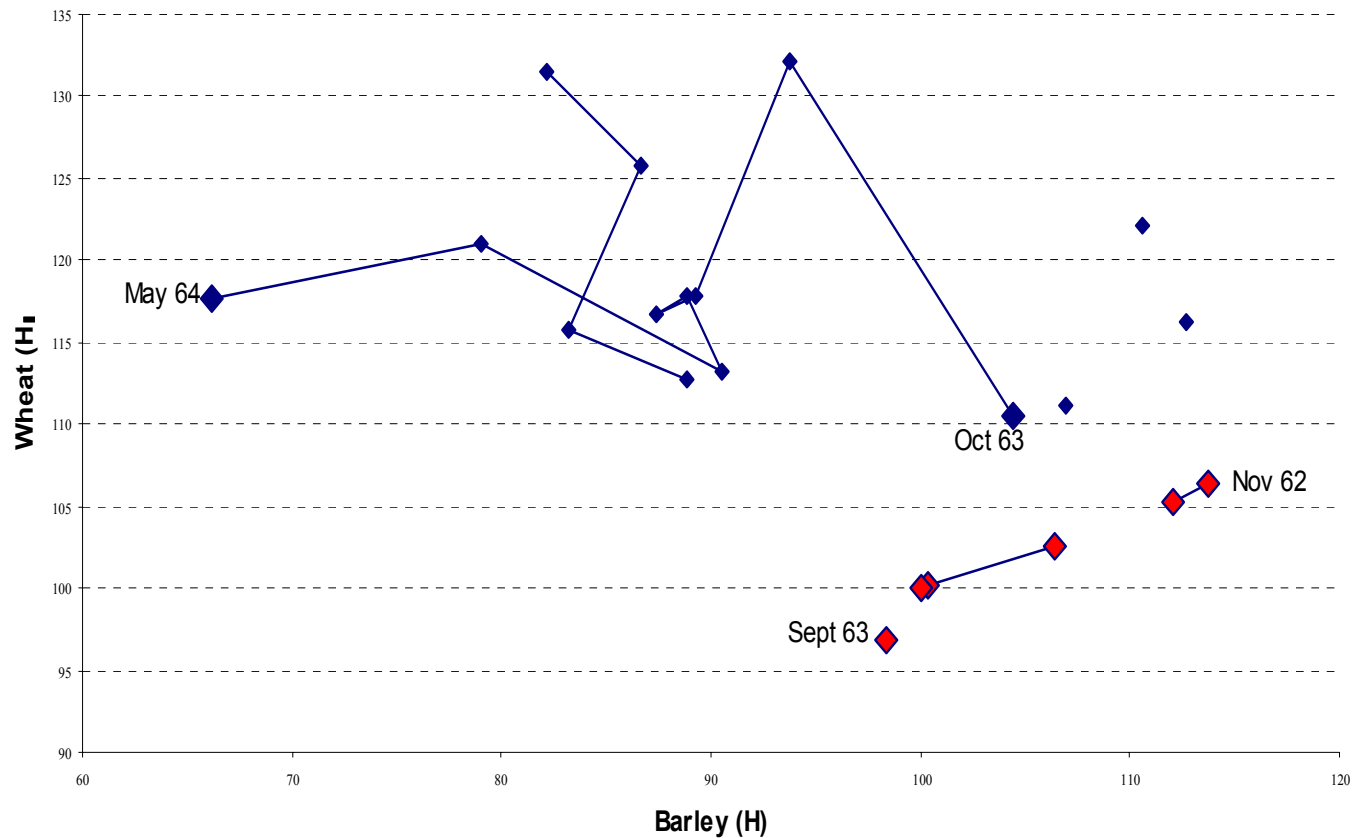
- BM is solvent IFF

$$F - \theta \leq x \left(\frac{1 - e^{-\lambda(L_A + L_H + L_B)}}{\lambda} \right)$$

Solvency boundaries

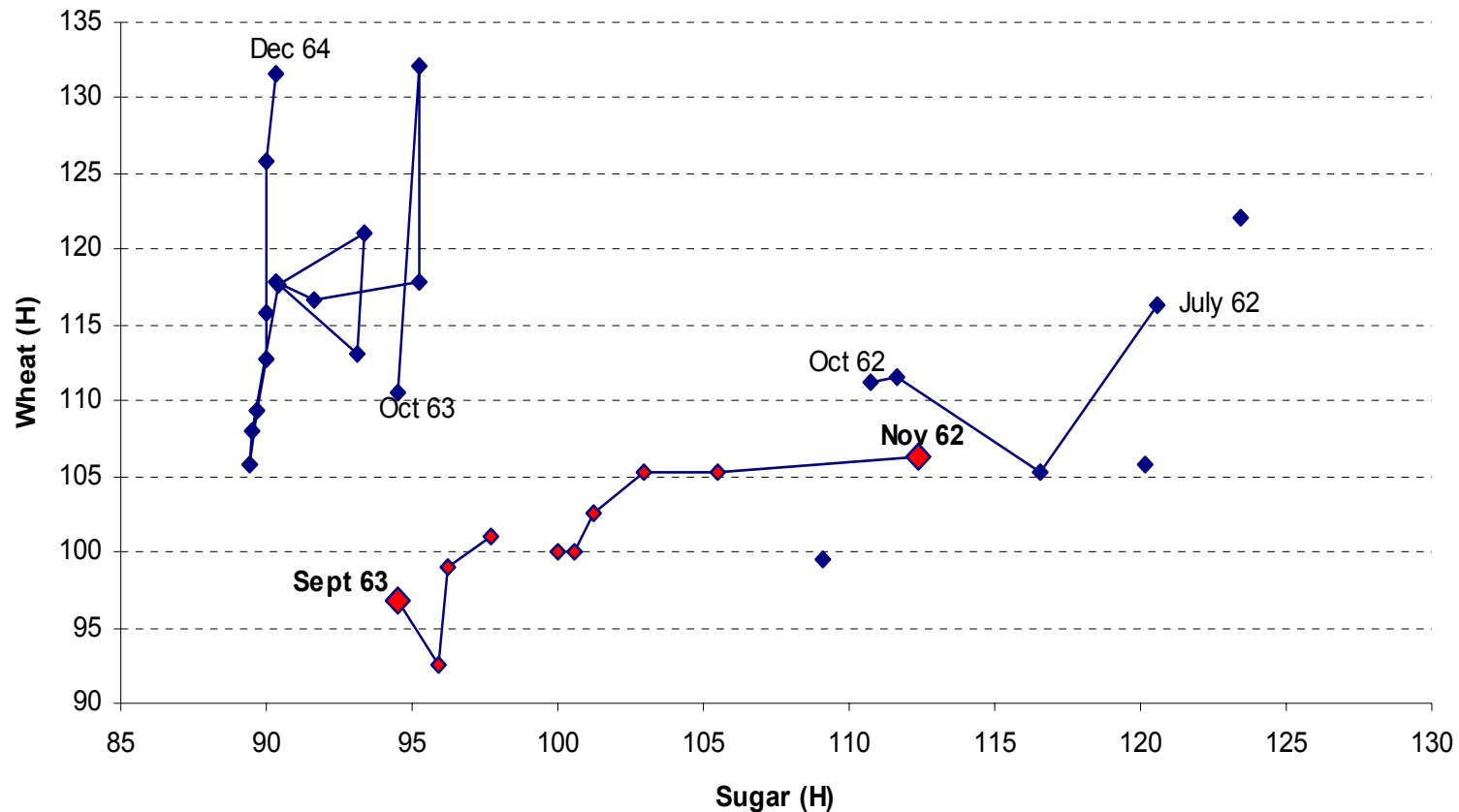


Scatter Plot of Prices I Barley and Wheat, Hamburg



Scatter Plot of Prices II

Sugar and Wheat, Hamburg



Peculiarities/General Lessons

Some peculiarities...

- Transferability of bills, peculiar to 18th C.
 - Difficulty of work-outs
 - Open-endedness of commitment (lack of “finality”)
 - Cares about subsequent owners, as well as previous owners, but this is beyond one’s control

Some Universal Themes

- Excessive leverage
- Aggregate risk: limits to hedging and of guarantees
- Asset-side contagion: very different from simple B/S domino effect
- There *is* such a thing as systemic risk...