Testing Noyes' Hypothesis: Was the Panic of 1907 a Global Financial Crisis?

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Motivation: tie up loose ends from 2014 forensic paper

- Thinking about transactions prompts useful research questions. Why did stock prices bottom in late November 1907 and not with formation of Morgan's stop-gap measures in October?
- We found the Bank of France's willingness to undercut the US premium on gold to defend its circulating medium.
- Loose ends from first paper: why was Heinze so sure the shorts would cover? Why wouldn't United Copper stock go lower?
- What was happening in the other countries Noyes wrote about?

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Hypothesis: source of 1907 crisis was international not domestic

- Timeline argument: if other cities experienced crises before NY or coincident with NY, then NY was not the cause
- Locations of bank panics outside NY were: Alexandria, Egypt; Nagoya, Japan; Amsterdam, Holland; Hamburg, Germany; Genoa, Italy; Santiago, Chile and Copenhagen, Denmark

Location and Timing of Bank Crises

Alexandria, Egypt	January1907 through April 1907
Nagoya, Tokyo and many other Japanese cities	April 1907 through April 1908
Genoa, Italy	September 1907
Hamburg, Germany	October 1907
New York, USA	October and November 1907
Santiago, Chile	November 1907 through January 1908
Amsterdam, Holland	November 1907
Copenhagen, Denmark	December 1907 through June 1908

Table 2
Bank Failures in Other Countries

Failed Bank	Defaulting Borrower(s)
Nagoya Bank and Fukui Bank, Japan	Cotton and copper exporting regions respectively, many defaulting borrowers
Societa Bancaria Italiana, Genoa, Italy	Ramifera, copper fabricator
Haller, Soehler & Co., Hamburg, Germany	Teplitz, Romanian mining operation
Knickerbocker Trust, New York, U.S.	United Copper, stock speculation at Heinze brokerage
Banco Mobilario, Santiago, Chile	Compania Gatico and San Bartolo, copper mining operators

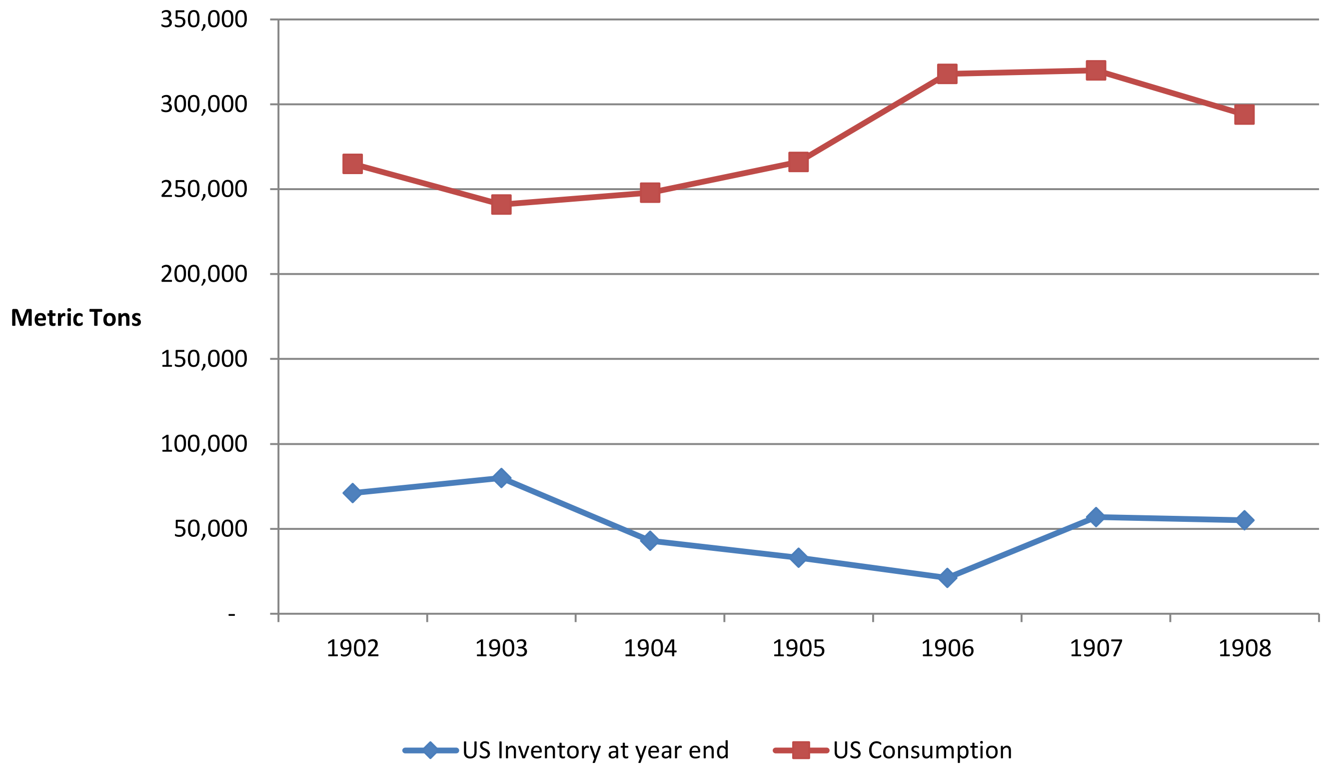
Source: Yabushita, Shiro and Atsushi Inoue (1993); Tusset (2011); Montreal Gazette, October 7, 1907; Bruner and Carr (2007); Behrens Fuchs (1985)

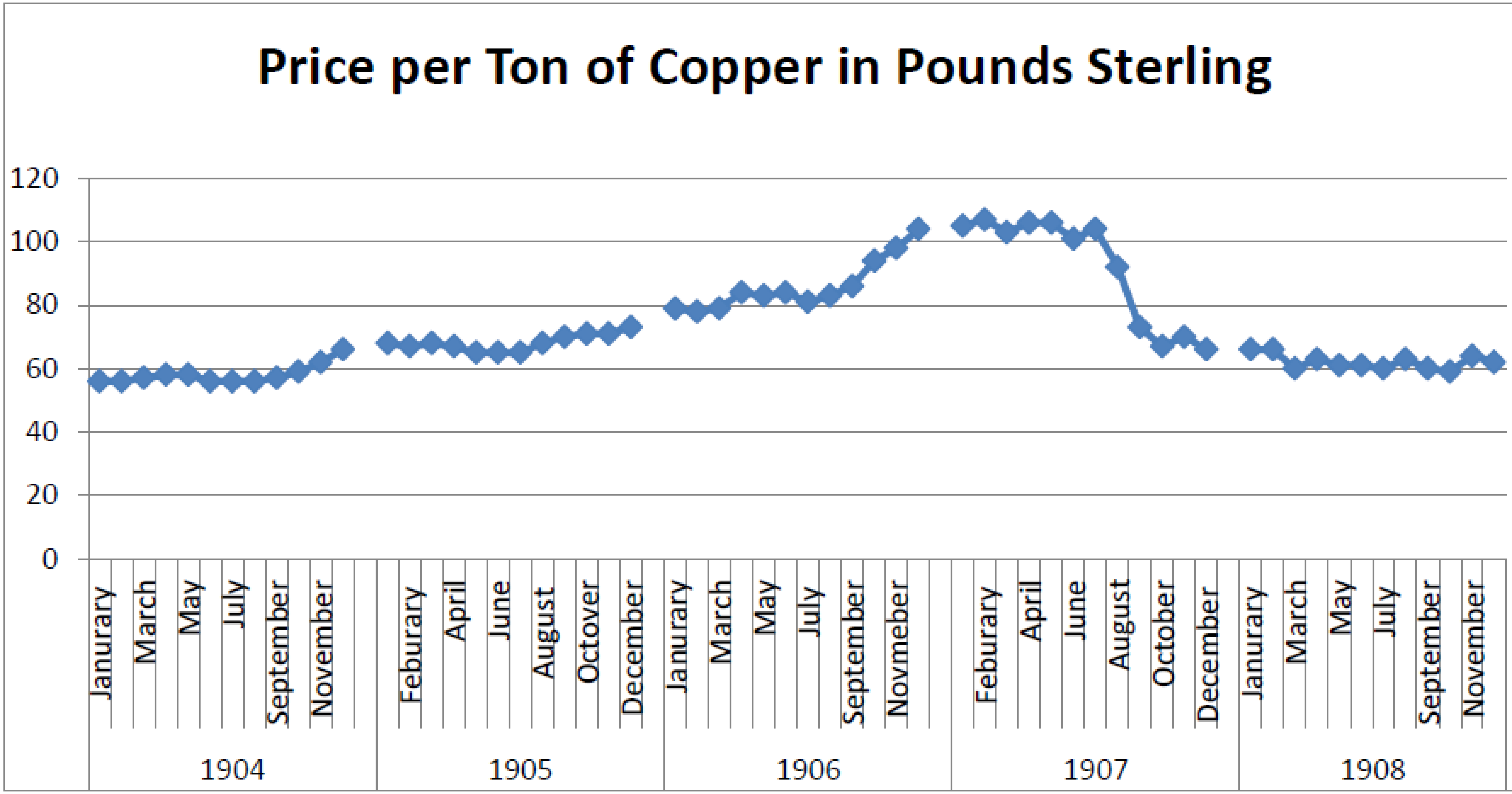
Understanding the Heinze transaction

- Heinze borrowed funds from banks and shadow banks to buy shares of company he controlled, United Copper, organized in 1902 to own claims to mines. In Butte, Heinze was the largest countervailing force to Amalgamated Copper, later known as Anaconda and controlled by Rockefeller interests.
- Started a concerted effort to buy the shares, sharply bidding up price on October 14 expecting shorts to receive margin calls, precipitating forced covering at his high limit prices to sell. Shorts were able to get more shares from other sellers willing to sell at lower prices to covering short sellers.
- He may have been convinced shorts would cover because the big drop in copper price was over. Other sellers might have been willing to sell at prices lower than Heinze's limit because big drop in copper price was over.

F. AUGUSTUS HEINZE,
Mining. Butte.

US Consumption of Copper and Year End Inventory
Source: US Geological Survey, Department of Commerce





Source: The Economist, Commercial Times Weekly Price Current column, editions from 1904 through 1908

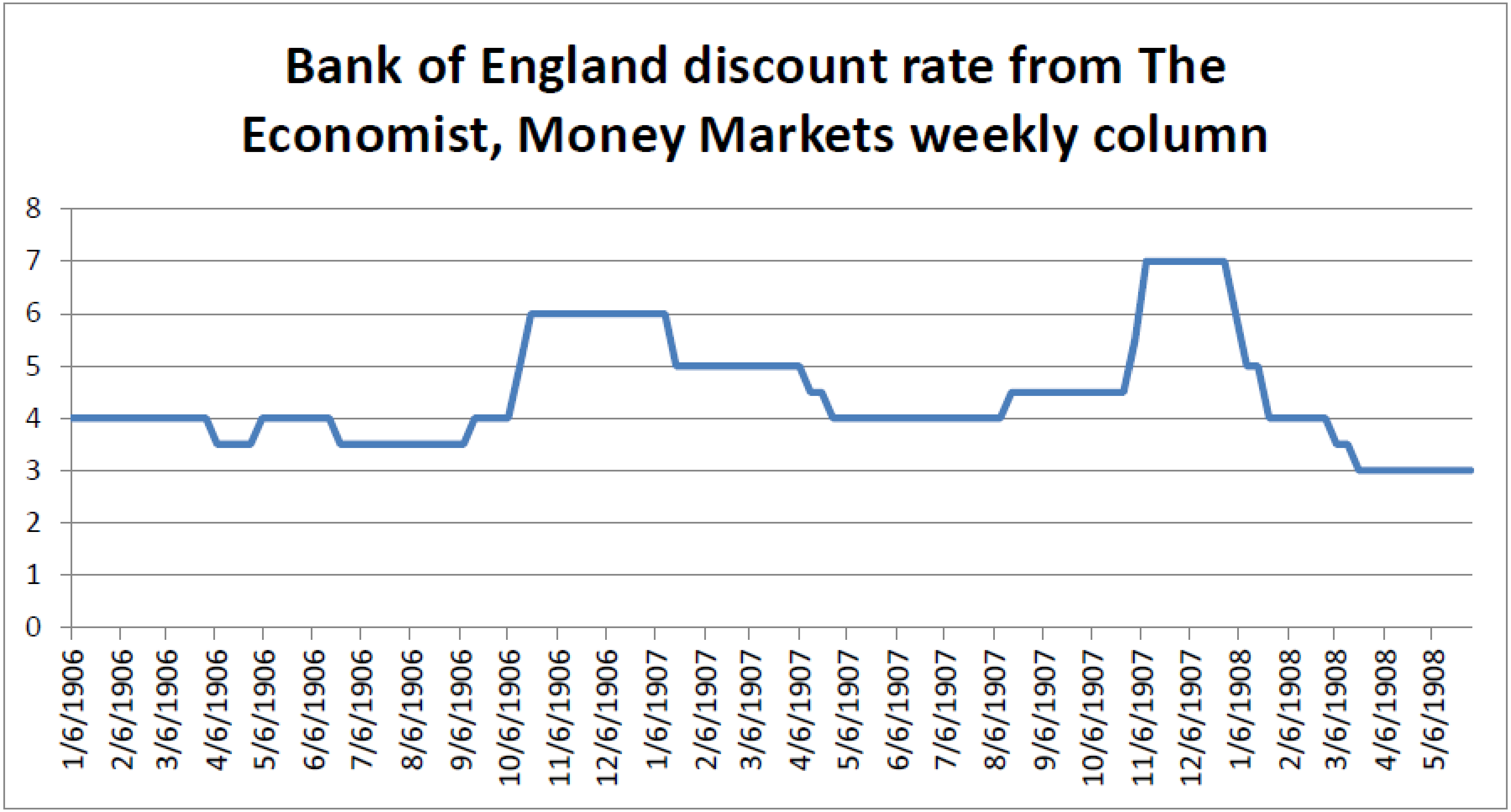

Bank of England discount rate from The Economist, Money Markets weekly column
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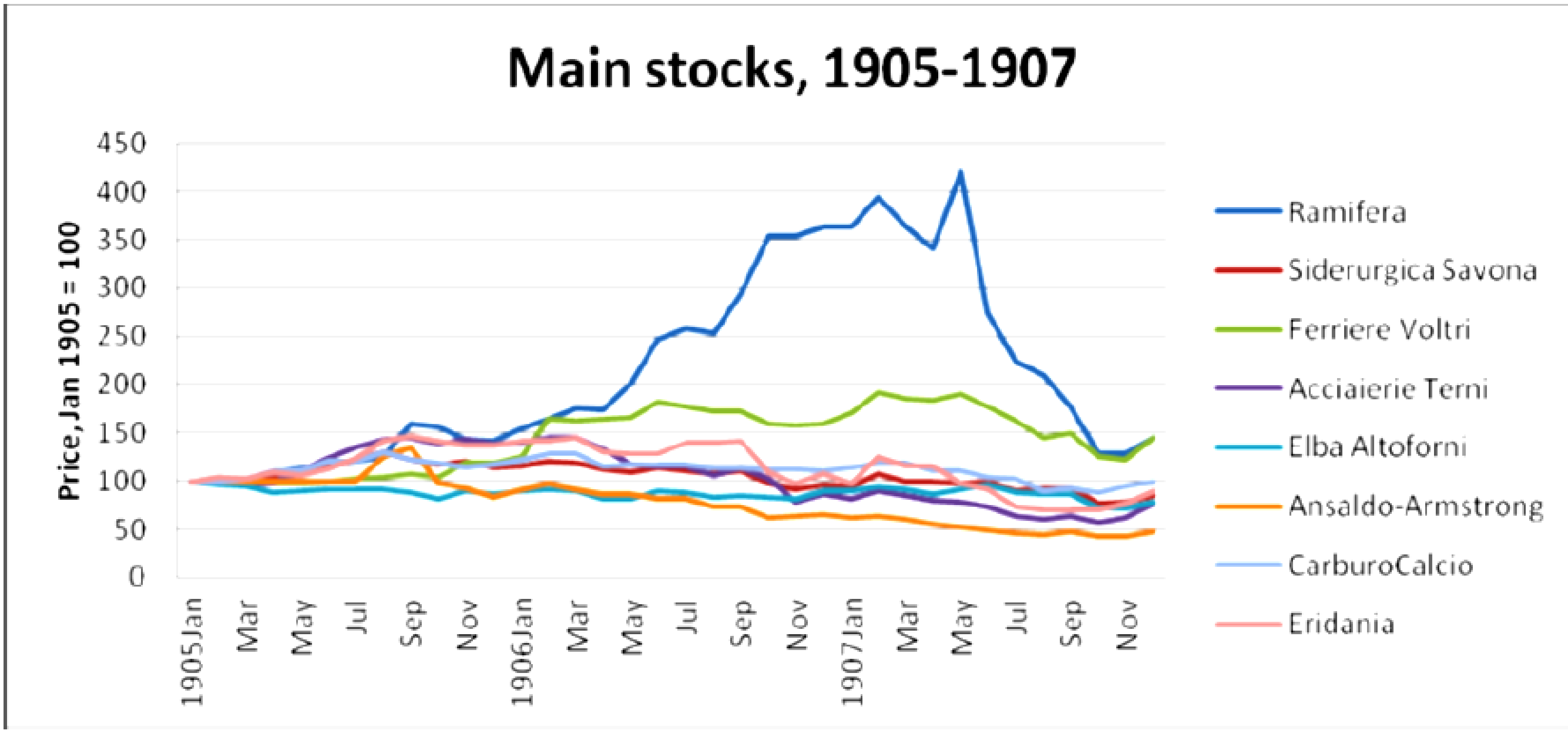
Figure 3
Performance of the Main Stocks Listed at Genoa Stock Exchange
January 1905 and 1907



Notes: Tusset, G. (2011), "Speculation by the Next-Door Neighbor: The 1907 Italian Financial Crisis", Working Paper Padua University.

Table 5
Toda-Yamamoto Causality Tests

Variables	**Dependent Variables** Copper	Discount
Copper	-------	1.91 -0.008 [0.39]
Discount	5.29 0.066 [0.07][c]	------
D418	0.117 (0.08)	0.239 (1.29)
D512	0.303 (0.22)	-0.123 (-0.68)
D901	2.556 (2.27)[b]	0.406 (2.77)[a]
RECESSION	-1.880 (-2.10)[b]	0.161 (1.38)
TIME	-0.031 (-1.46)	-0.007 (-2.63)[a]
Intercept	5.806 (2.70)[a]	0.726 (2.59)[a]
Adj.R^2	0.986	0.929

Notes: For Copper and Discount, modified Wald chi-square statistics to test whether the k = 2 lags are equal to zero are displayed with probability values underneath the test statistics in brackets. The sum of the lagged coefficients represents the summation of the lags in the VARs excluding the lagged coefficient with the highest order. For the remaining variables, the coefficient estimates are reported with t-statistics in parentheses. Significance levels are as follows: a(1%), b(5%), and c(10%). Both autocorrelation and heteroscedasticity are absent from the VAR model based on the multivariate Box-Pierce/Ljung-Box Q-statistics up to 12 lags and White's test for heteroscedasticity for a system of equations.

Results

- Inelasticity of quantities supplied and demanded of copper with respect to price led to especially volatile price. That means loans made by banks to copper producers could be riskier than other types of loans.
- Long term price rise may have accelerated in the San Francisco episode; dummy variable associated with the largest liquidity inflows to SF is significant.
- Borrowers sensitive to copper prices failed, and lenders sensitive to those borrowers failed.
- Each country had unique response to bank failure but all required a lender of last resort to provide liquidity.

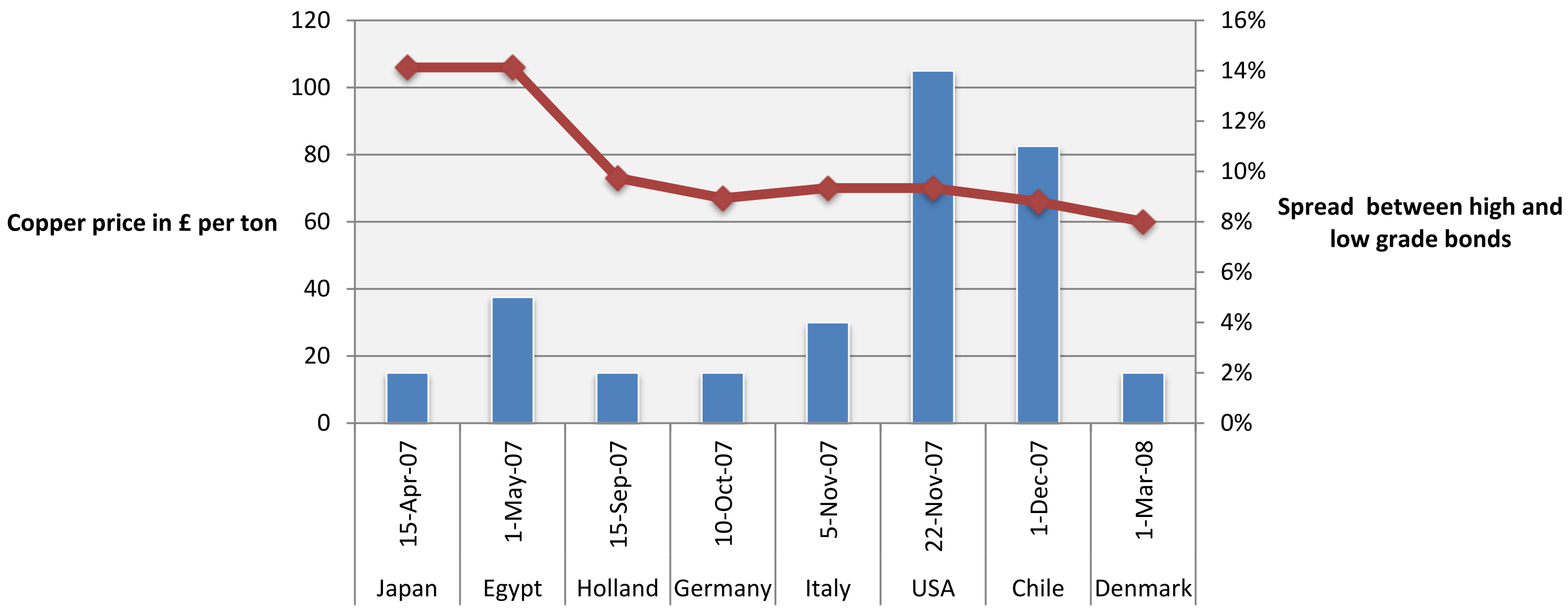
More results

- Copper price also sensitive to business cycle variable. When monetary tightening eventually produced recession in May 1907, demand for copper likely declined and prices, although inelastic, eventually responded by declining

Questions still to answer

- We want to know more about each failed bank. Chile has the most accessible information so far.
- We want to know if there are there data from San Francisco that refer to copper usage after quake.
- We want to know the features of each country's institutional settings that were associated with varying degrees of crisis severity.

Dates and sizes of spreads compared to timing of drop in copper prices sorted by country



Indicator of Global Liquidity