US Bond Markets and Credit Spreads during the Great Depression

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Literature Review

- Bernanke (1983), Hamilton (1987) and Mishkin (1991). Credit Tightness = Baa - long term Treasury rate. Spread jumps to almost 8% in mid 1932. Asymmetric information? Bond spreads (Aaa - Treasury) rise from 0.5% to 2.5% 1932-33.

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- Baum and Thies (1992) use Railroad bonds from 1919-1930. Bond markets expected rising rates at start of 1928 and then falling rates at start of 1930.

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- mid 1937 to mid 1938 - second severe recession, industrial production down 50%.

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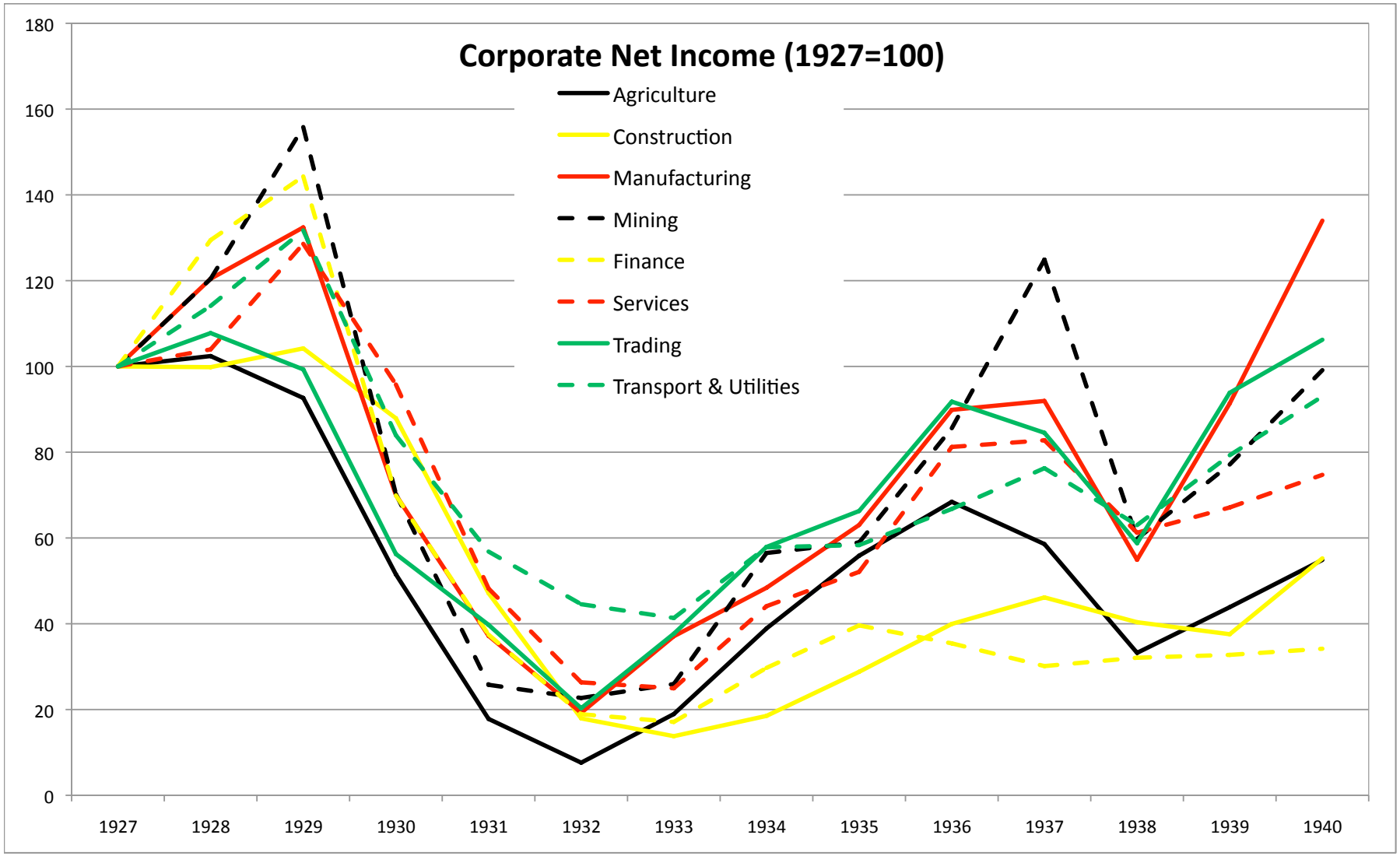
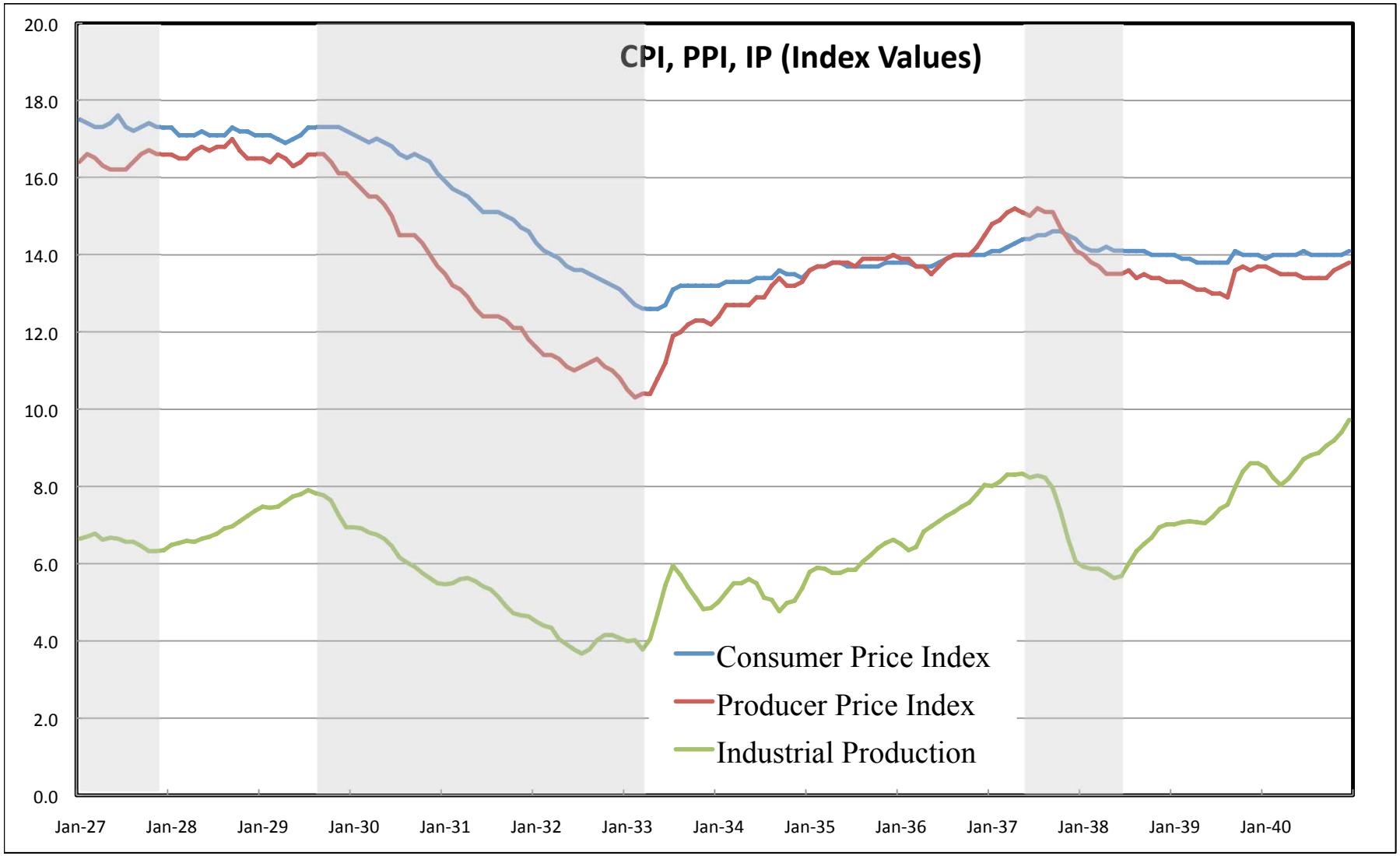
- Business Cartels/Rigid Wages (Cole and Ohanian)

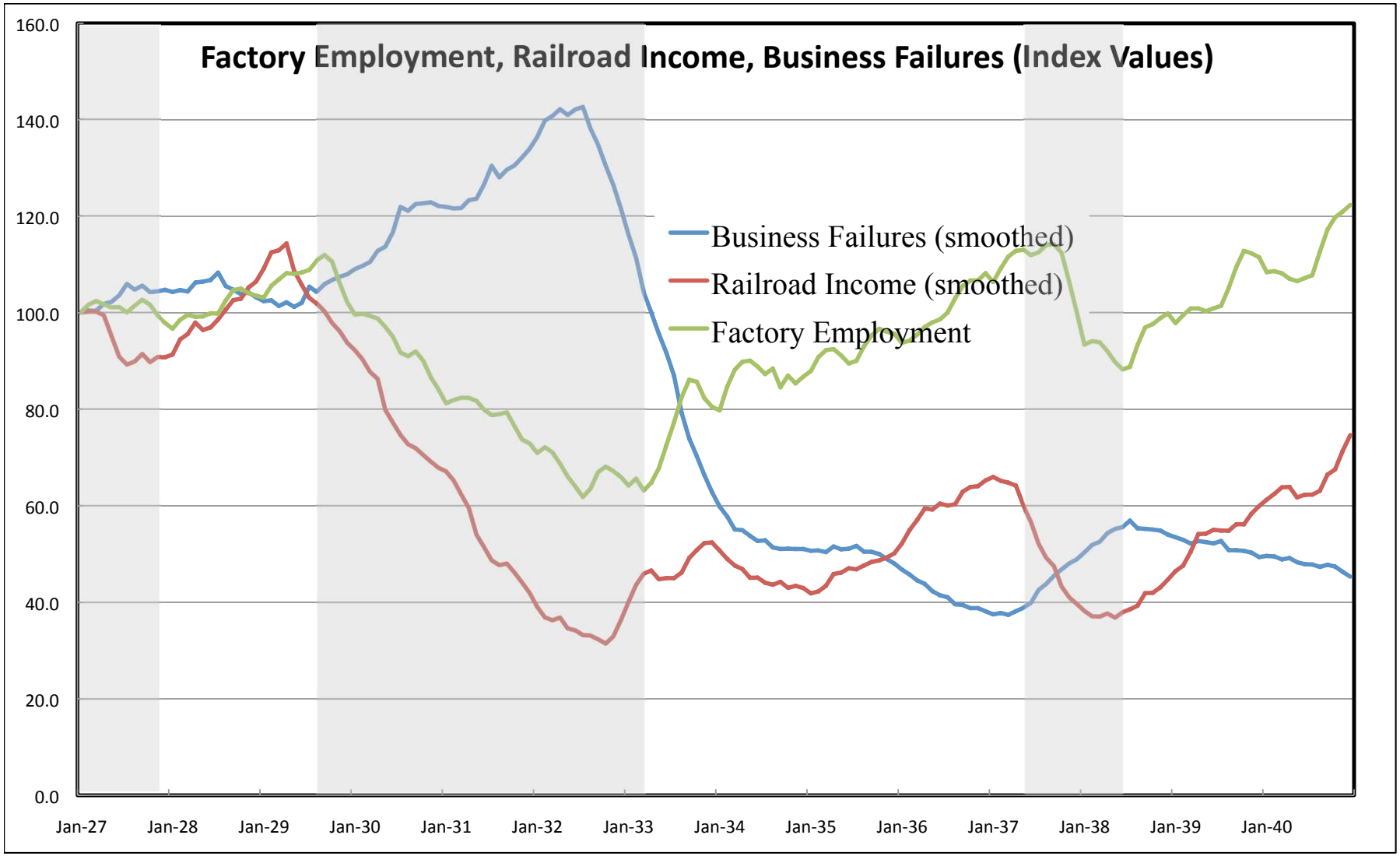
Corporate Income



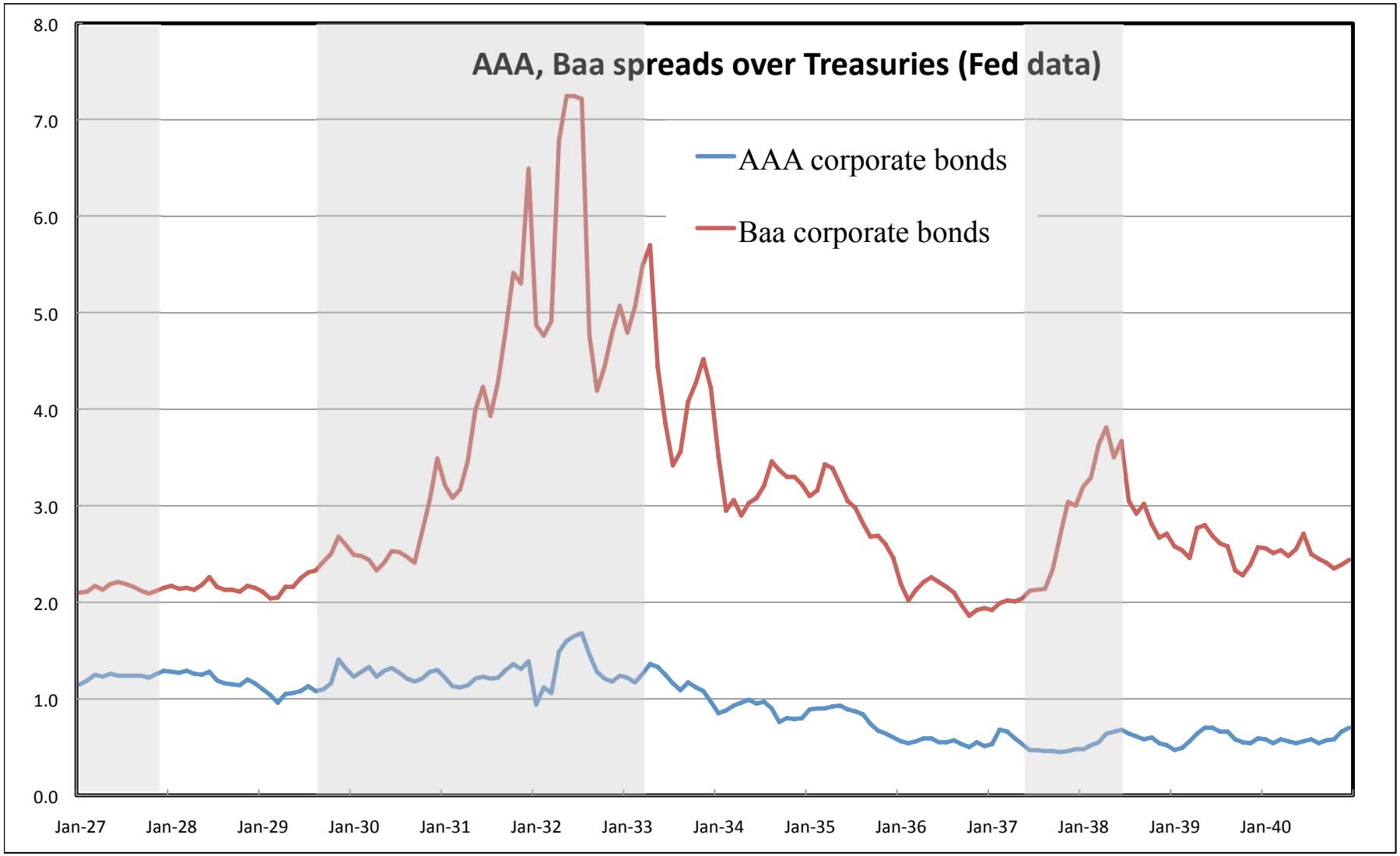
Prices


CPI, PPI, IP (Index Values)
20.0
18.0
16.0
14.0
12.0
10.0
8.0
6.0
4.0
2.0
0.0
Jan-27
Jan-28
Jan-29
Jan-30
Jan-31
Jan-32
Jan-33
Jan-34
Jan-35
Jan-36
Jan-37
Jan-38
Jan-39
Jan-40
Consumer Price Index
Producer Price Index
Industrial Production

Real Economy



Bond Spreads



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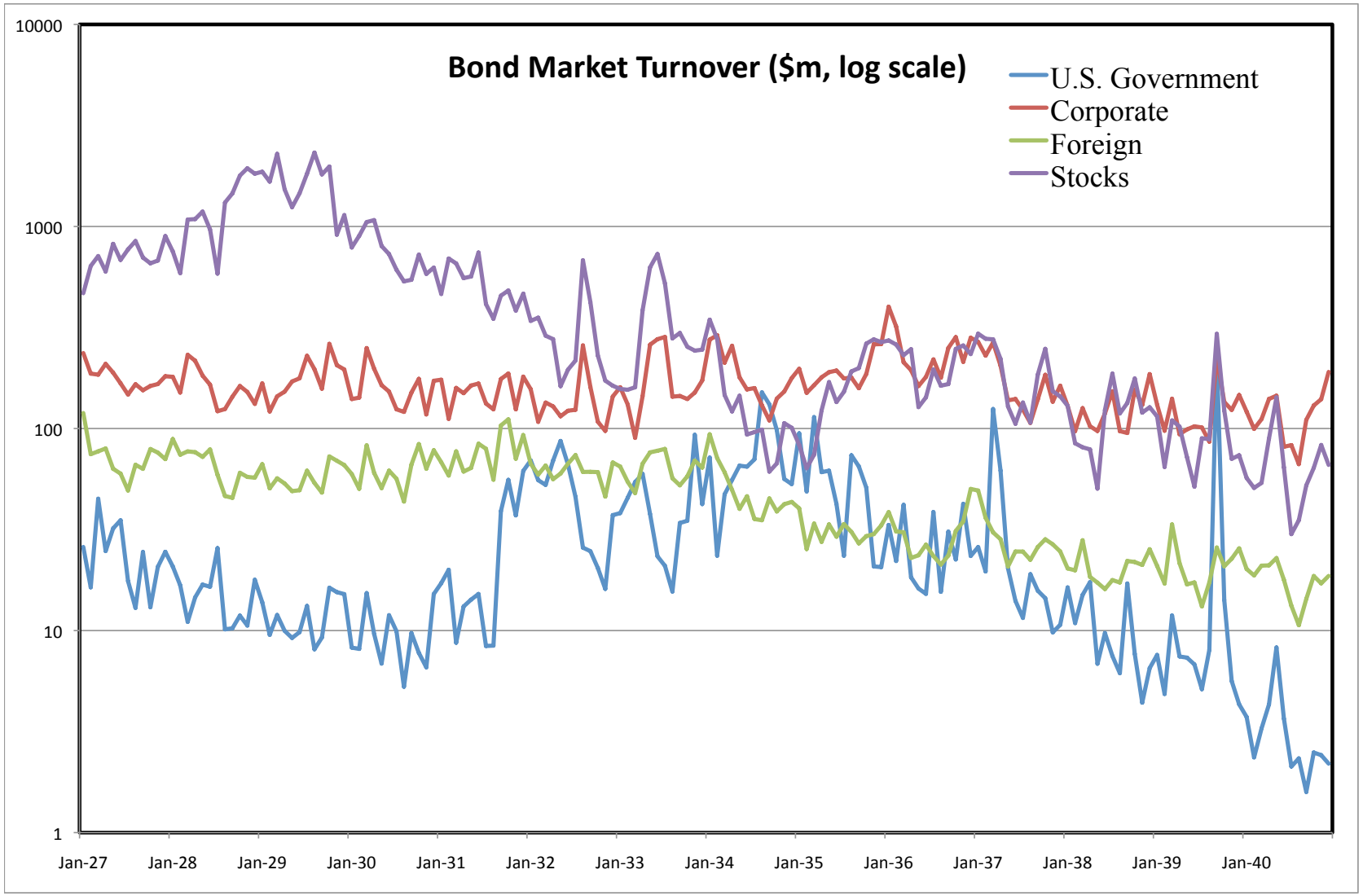
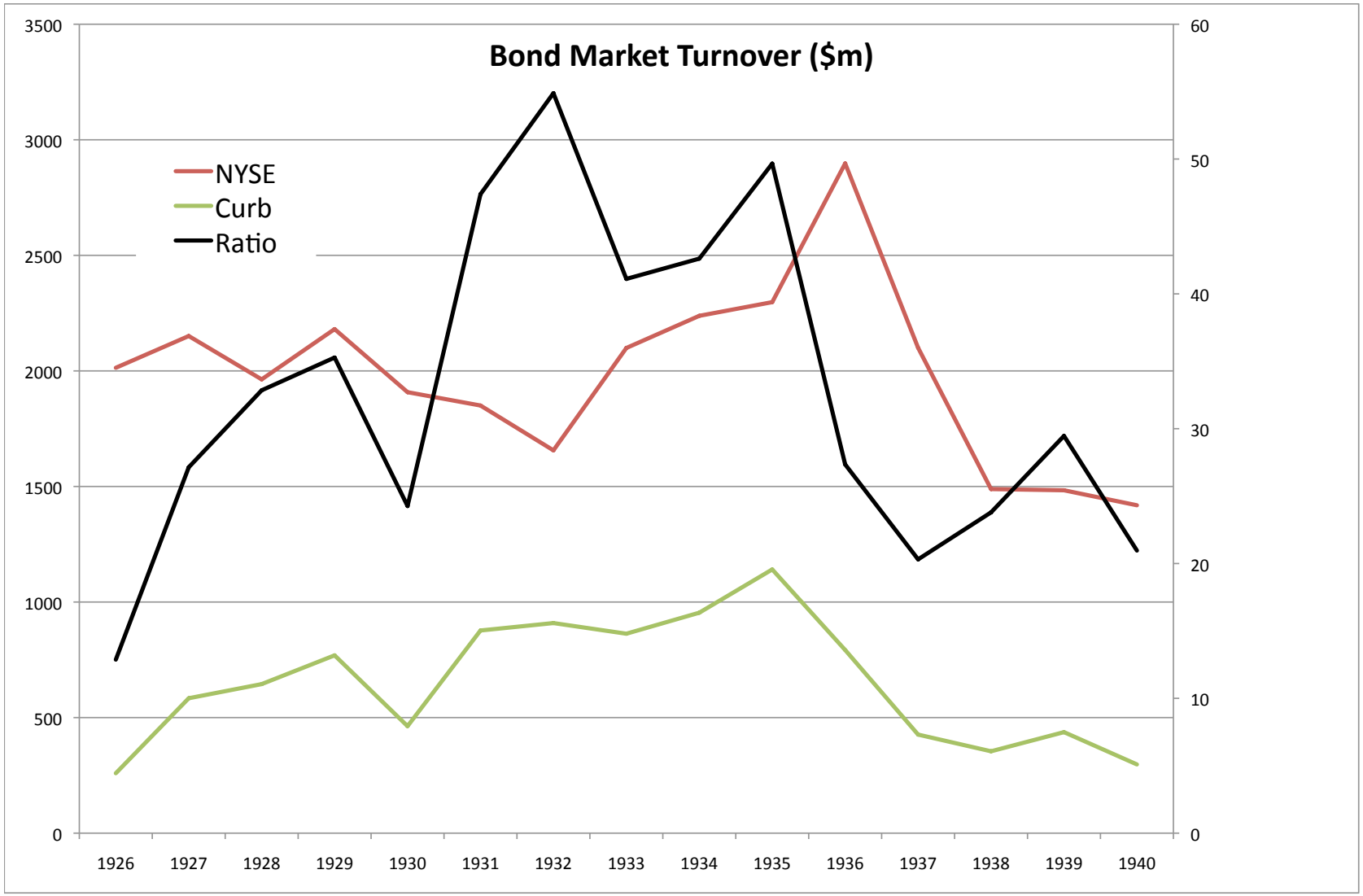
- This occurred during the late 1940s.
- Prior to this, corporate bonds were traded mostly on the NYSE.
- Municipals were OTC since the 1920s, and Treasuries were transitioning from the NYSE to the Dealer market during the late 1930s.

Turnover


Bond Market Turnover ($m, log scale)
U.S. Government
Corporate
Foreign
Stocks
10000
1000
100
10
1
Jan-27
Jan-28
Jan-29
Jan-30
Jan-31
Jan-32
Jan-33
Jan-34
Jan-35
Jan-36
Jan-37
Jan-38
Jan-39
Jan-40

NYSE versus Curb market



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- Match with CUSIPs from CRSP.

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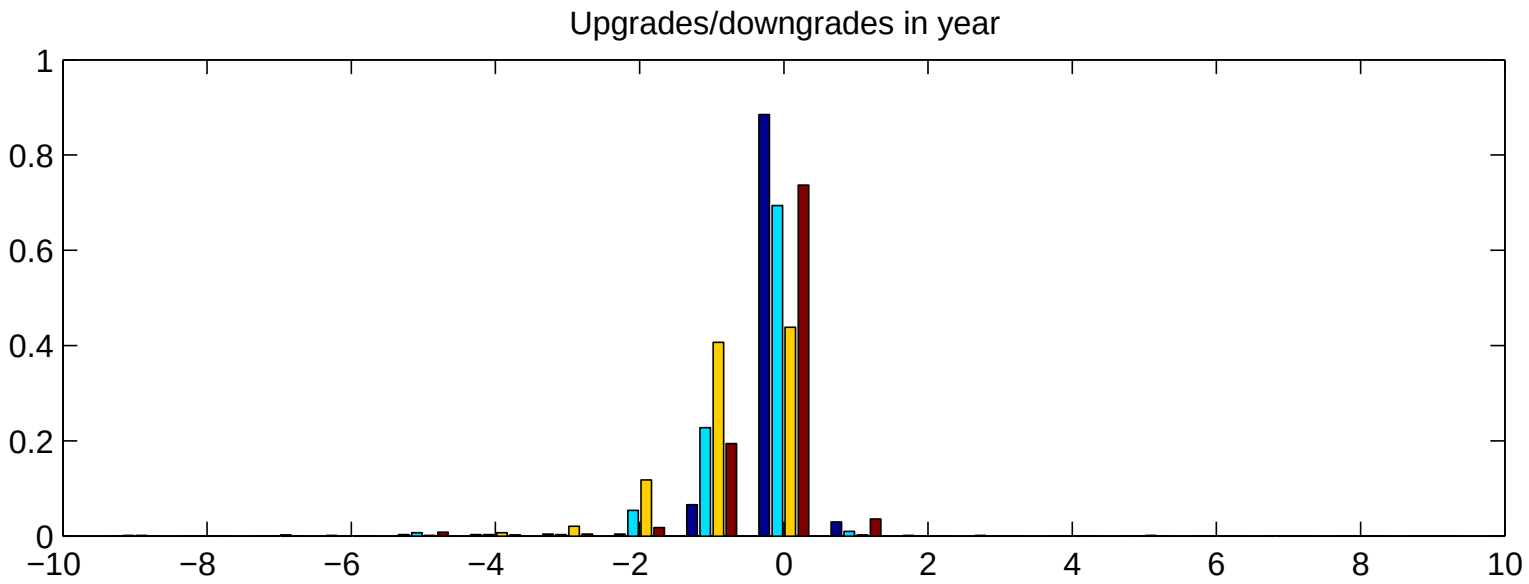
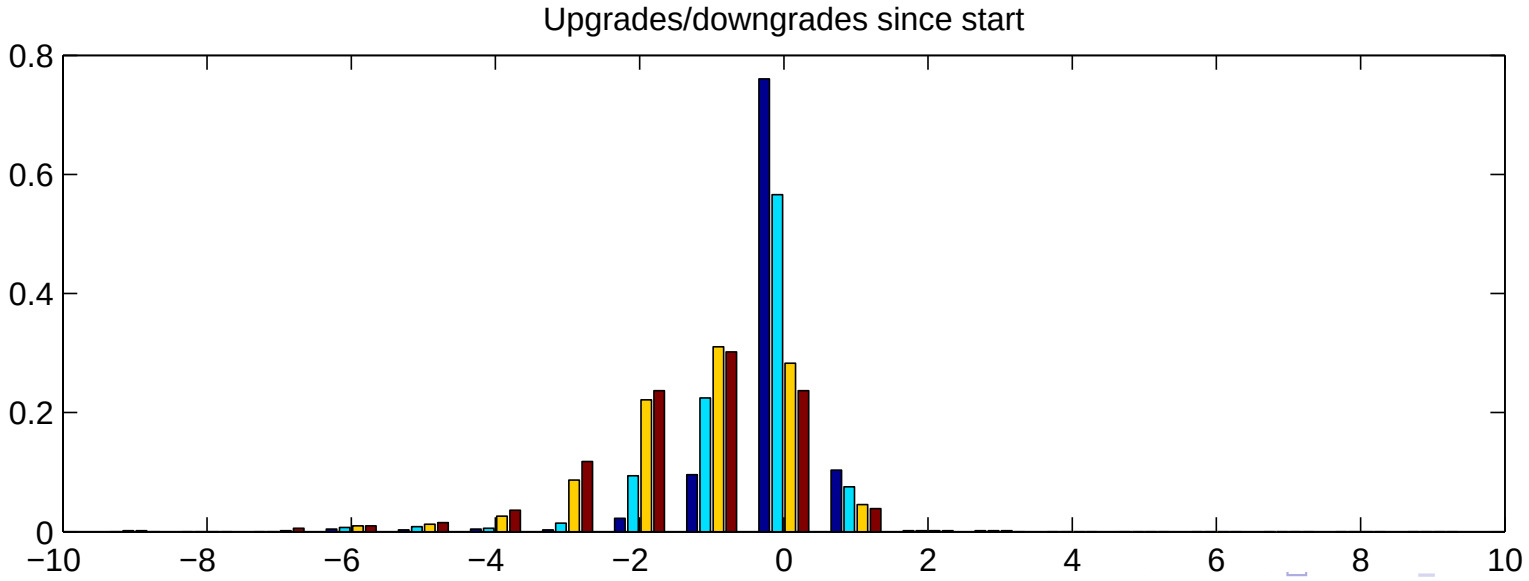
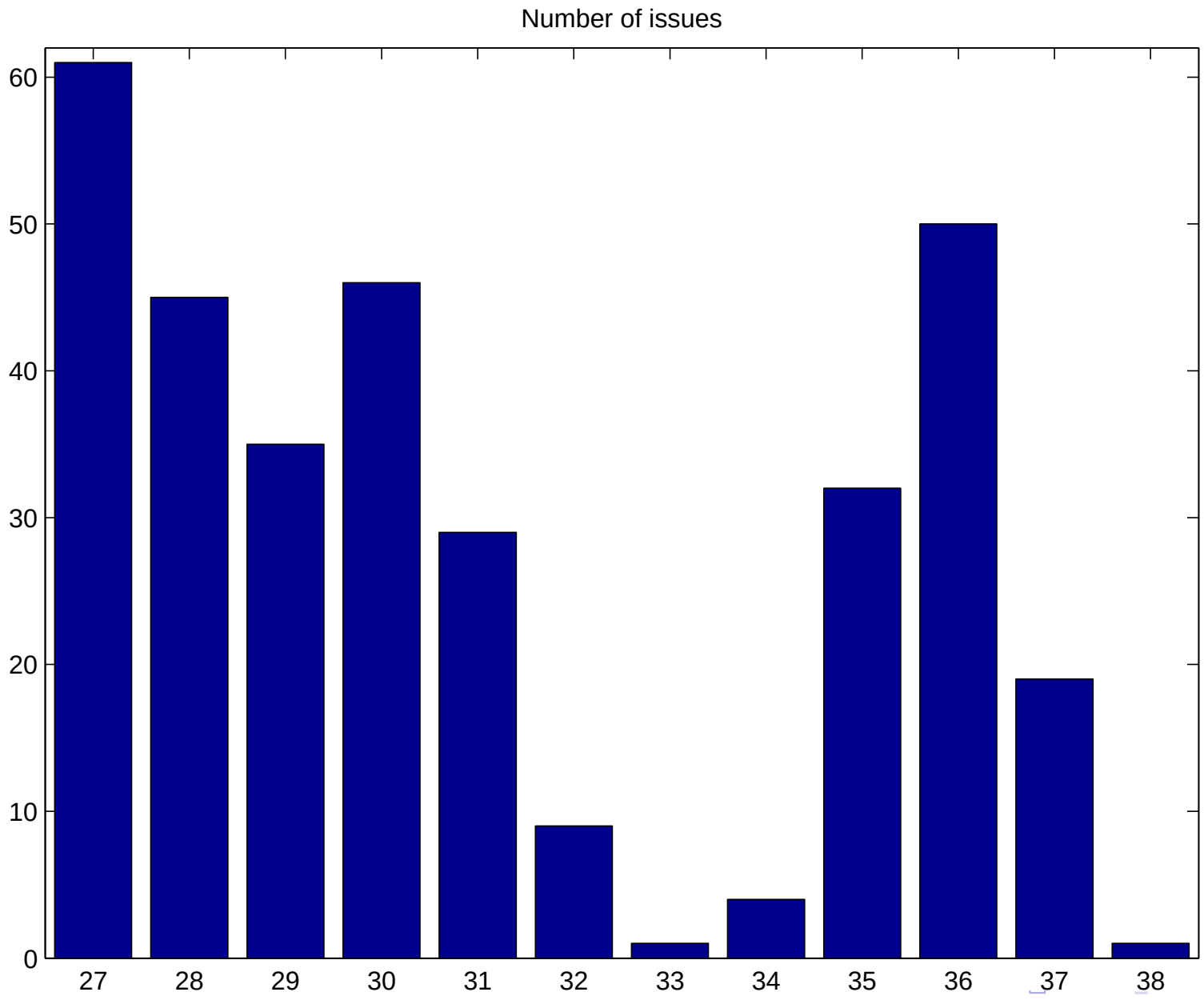
- Apply Fama-Bliss filtering (on Treasuries) to remove outliers for each yield curve.

Upgrades and Downgrades

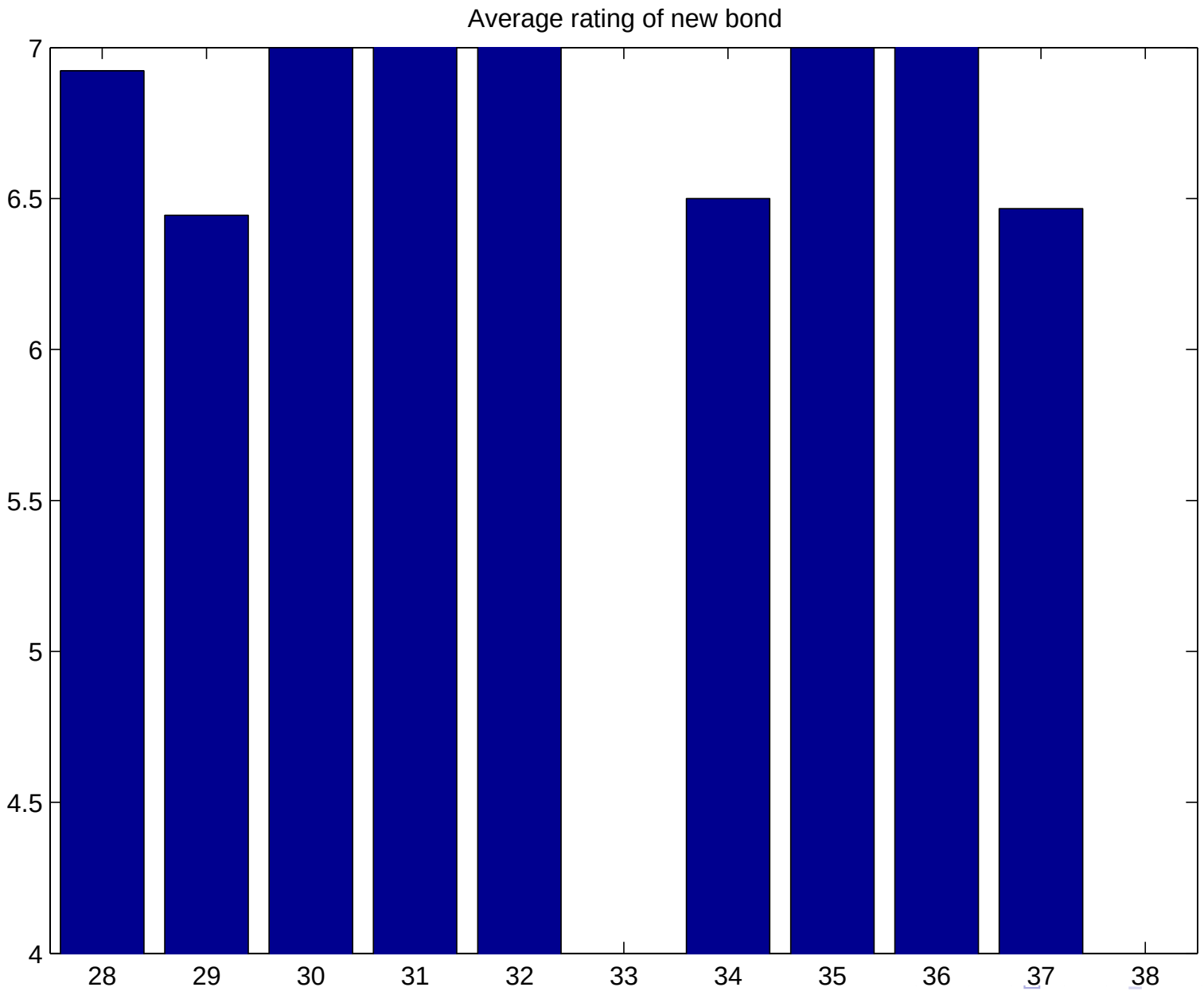




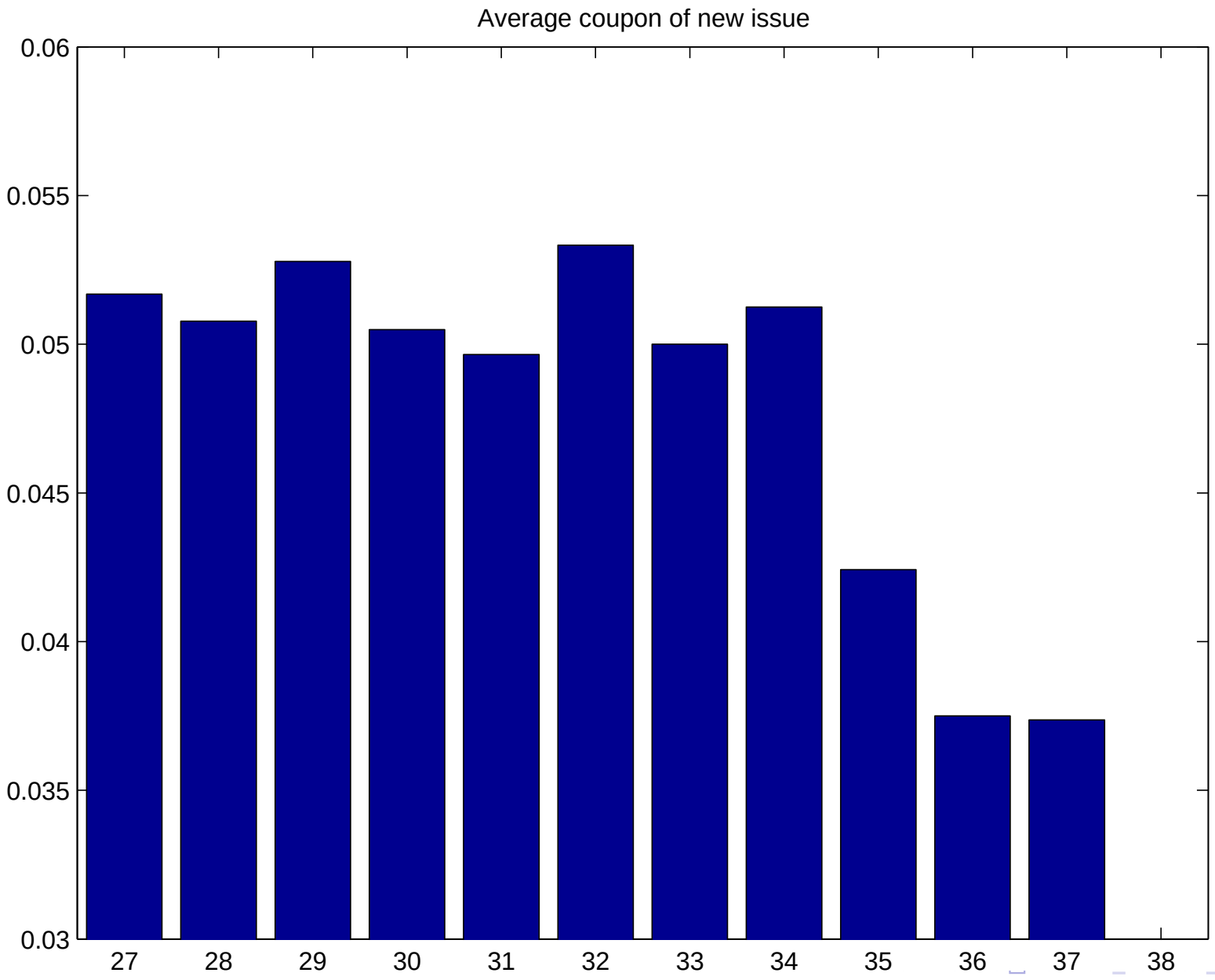
New Issues of bonds



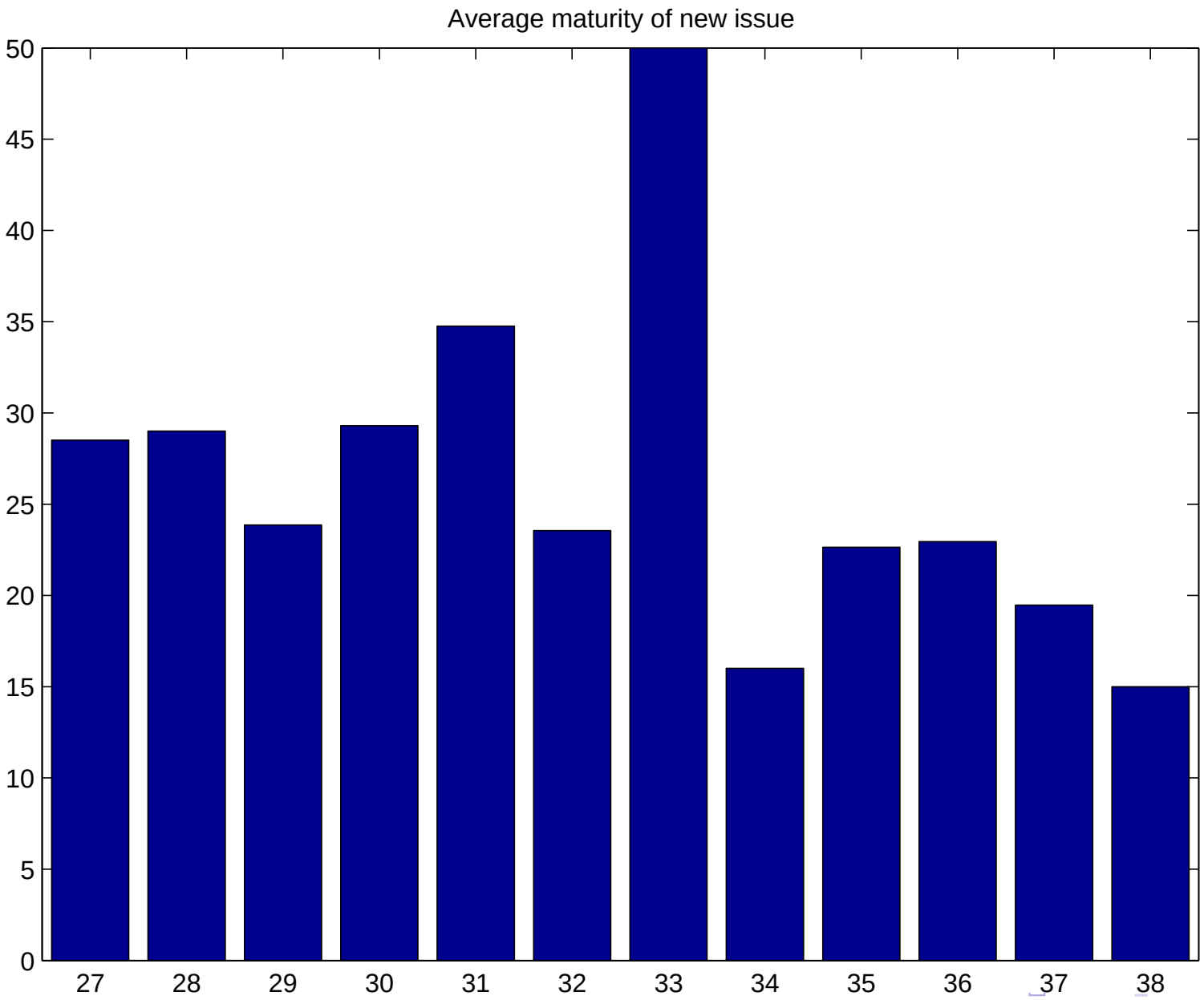
Average rating of new issues



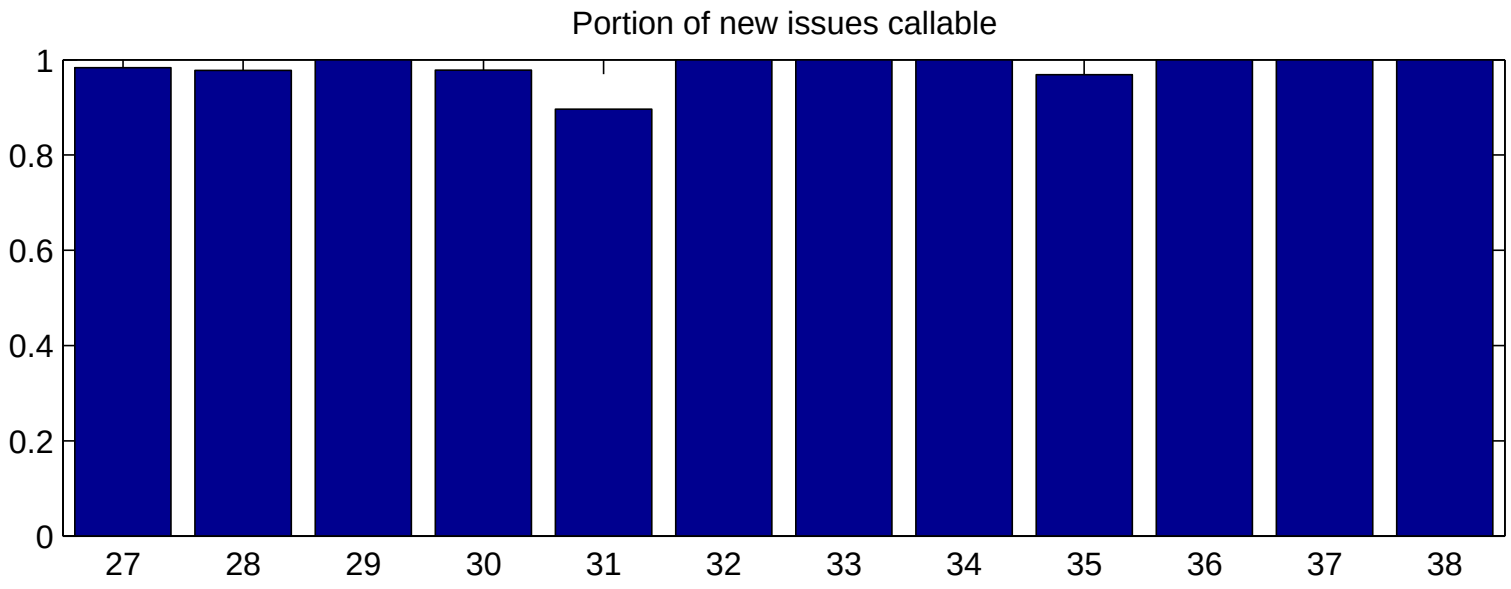
Average coupon of new issues

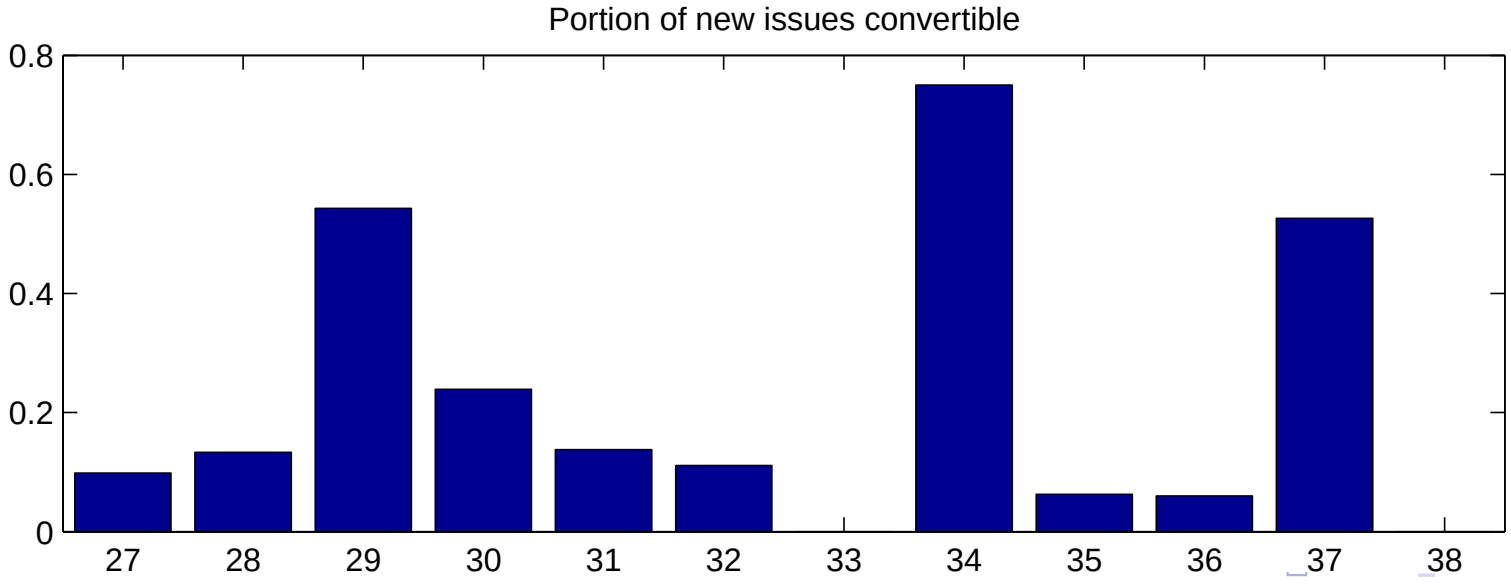


Average maturity of new issues



Portion of new issues with optionality





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- We would like to observe the zero coupon yield curves.
  - Zero curve gives us a discount rate which would be used to value a zero coupon bond at different times (i.e. not contaminated by coupon effects).

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- We have one parameter to play with for each t_k.

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  - This is important, since long maturity bonds will be very sensitive to interest rate changes, and we might otherwise end up fitting these, but not the short maturities.

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- Most have notice periods (e.g. firm must give 2 months notice to call bond).

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  - 388 are Semi-American, 152 are American.
  - Of the "simple" callables, 164 are Semi-American, 33 are American.

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- Solve PDE, incorporating early exercise properties (and notice).
- Can include these bonds in with the plain-vanilla bonds, but now we must also choose κ and σ (mean reversion and volatility).

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  - Estimating κ and σ are useful in their own right, since they tell us about market participants' opinions about volatility (implied volatility).

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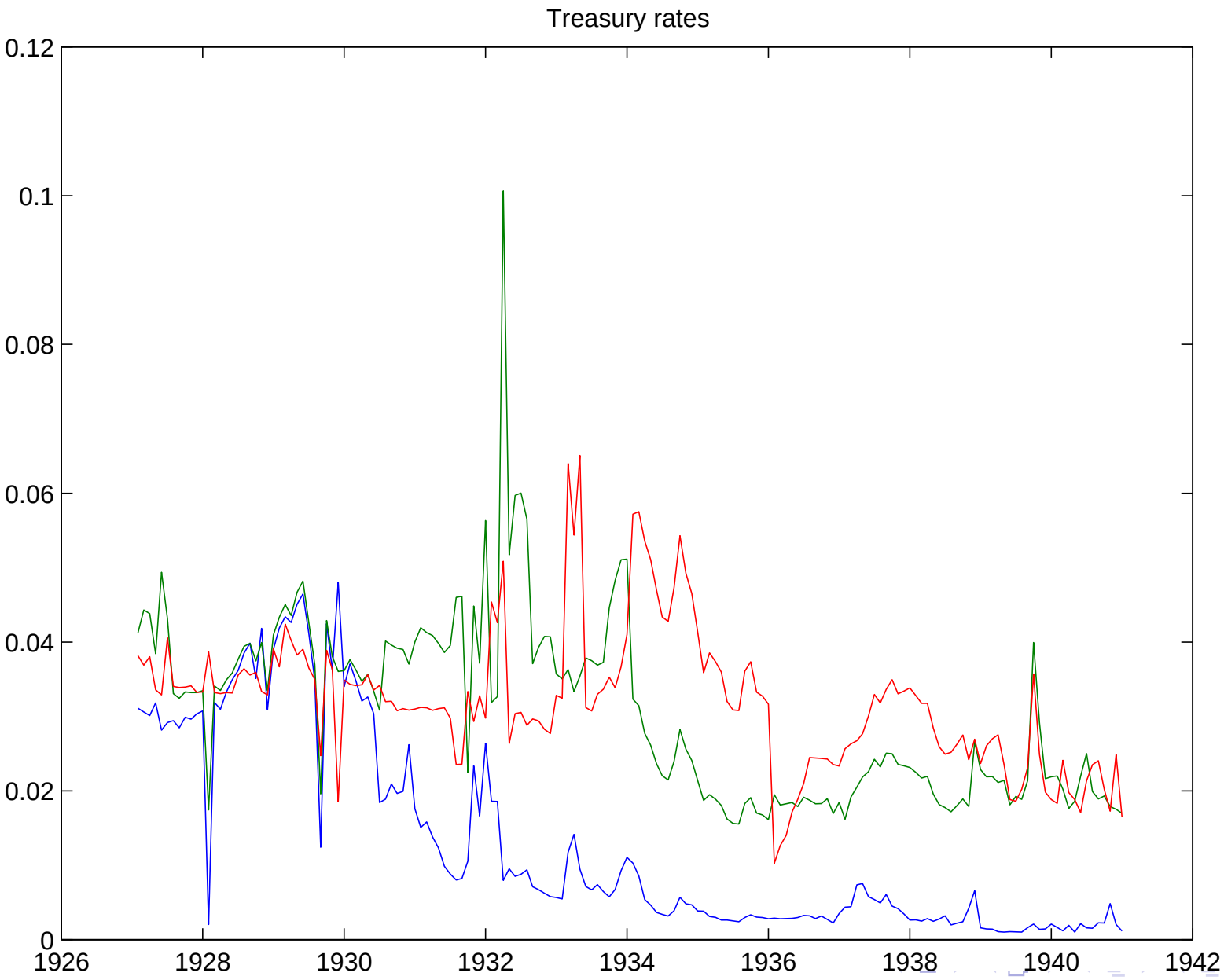
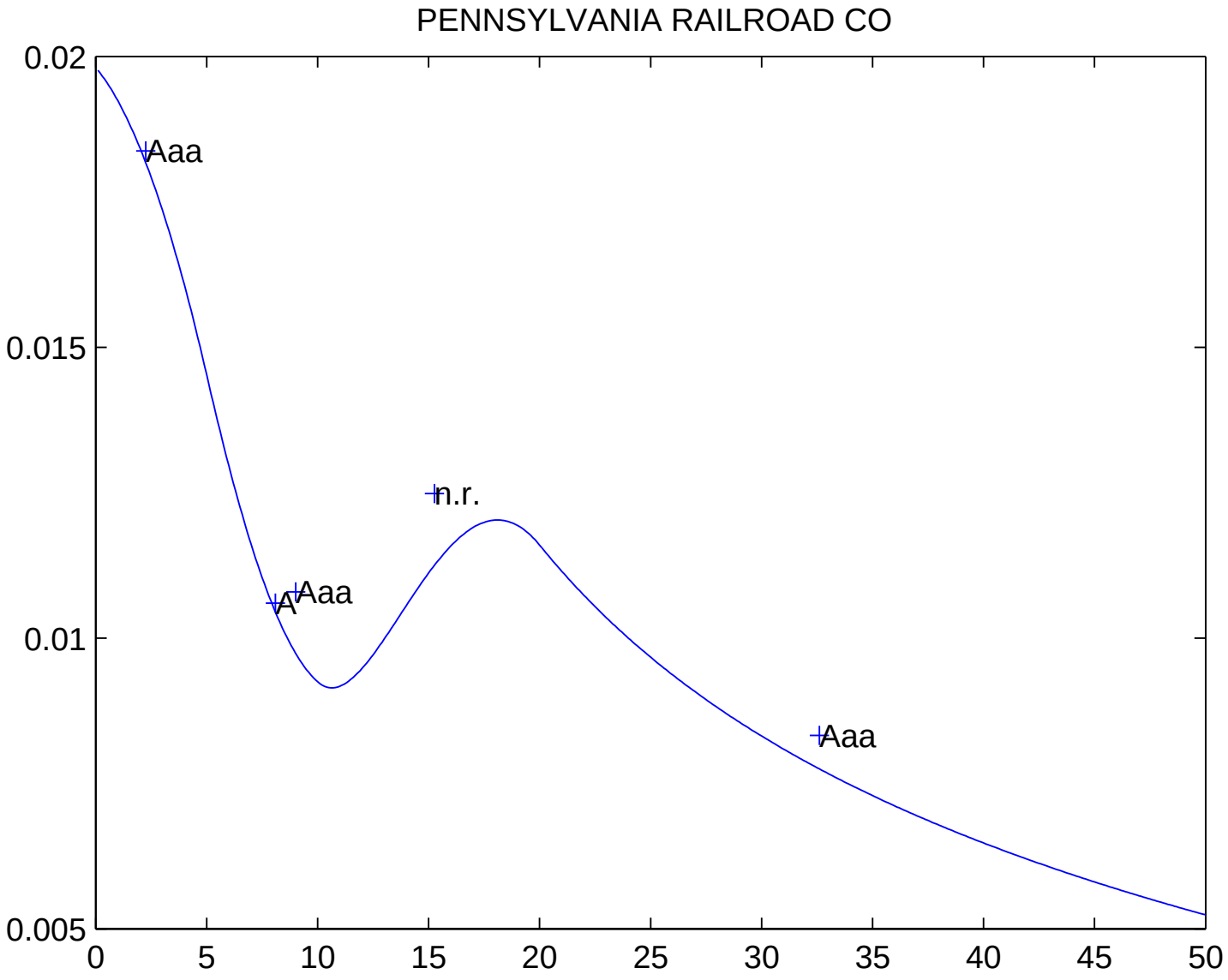
  - Work only when we have at least 1 noncallable per day, and 2$+$ noncallables.

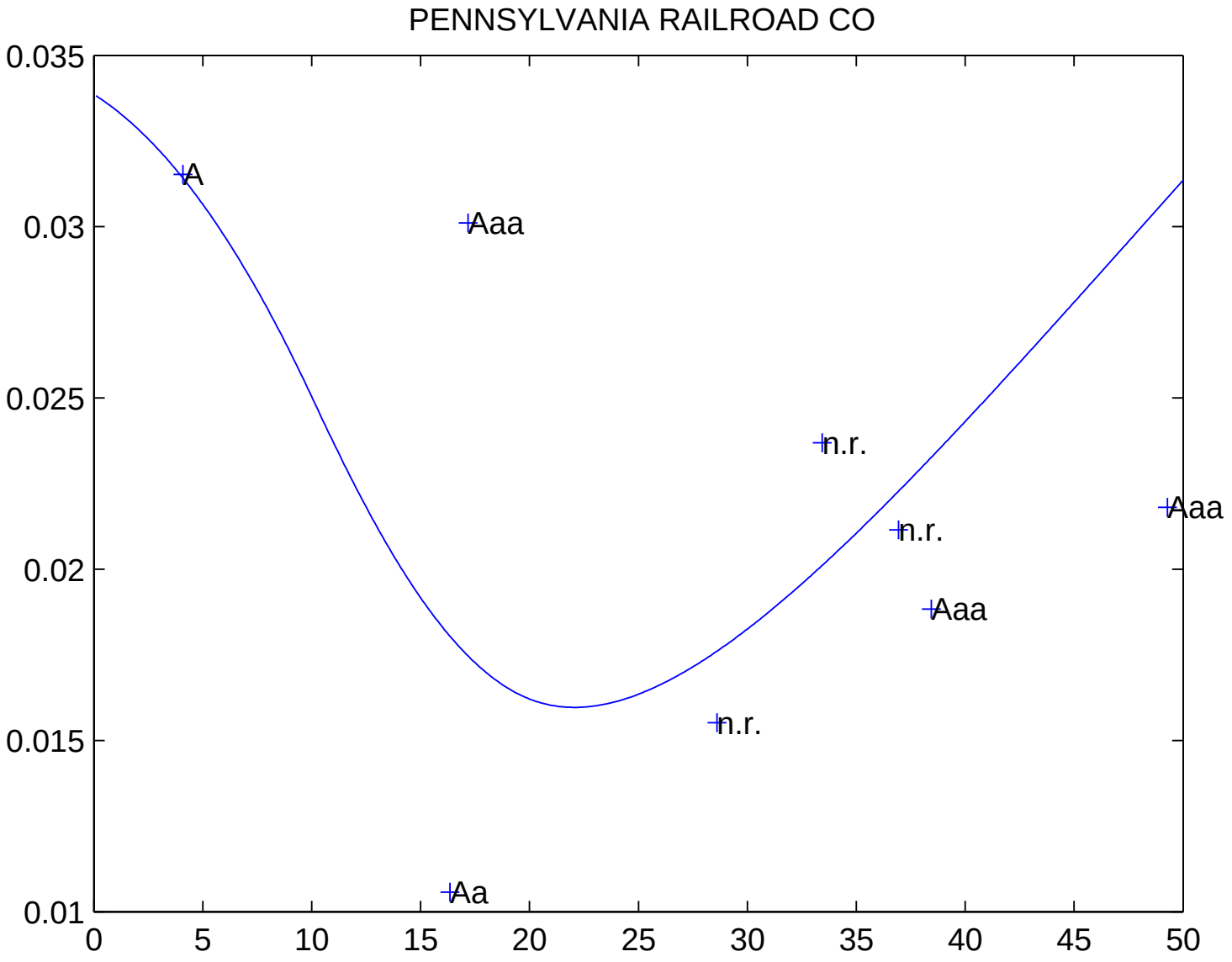
Sample output: Treasury curves



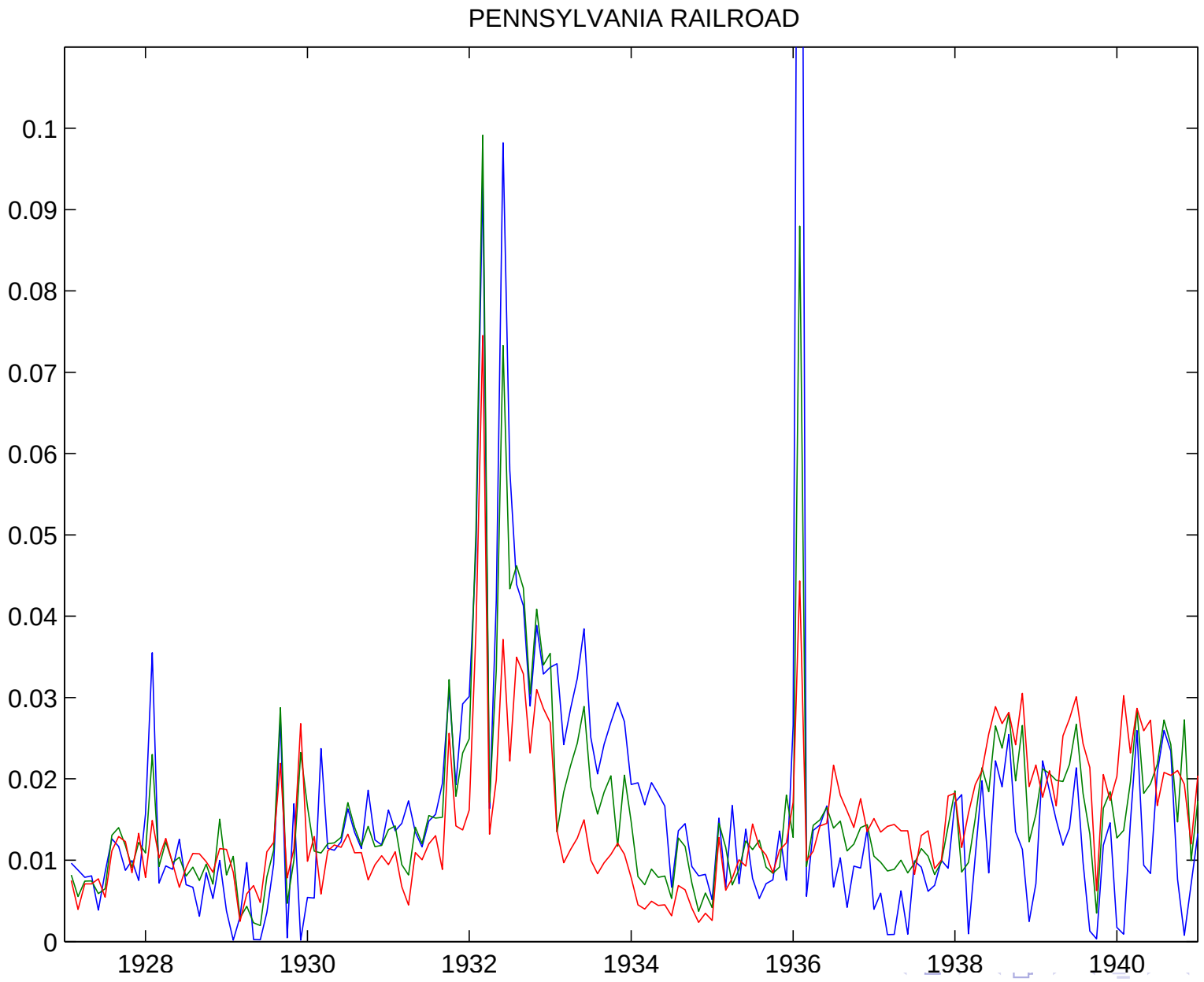
Sample output: Pennsylvania Railroad Snapshot Dec 1927



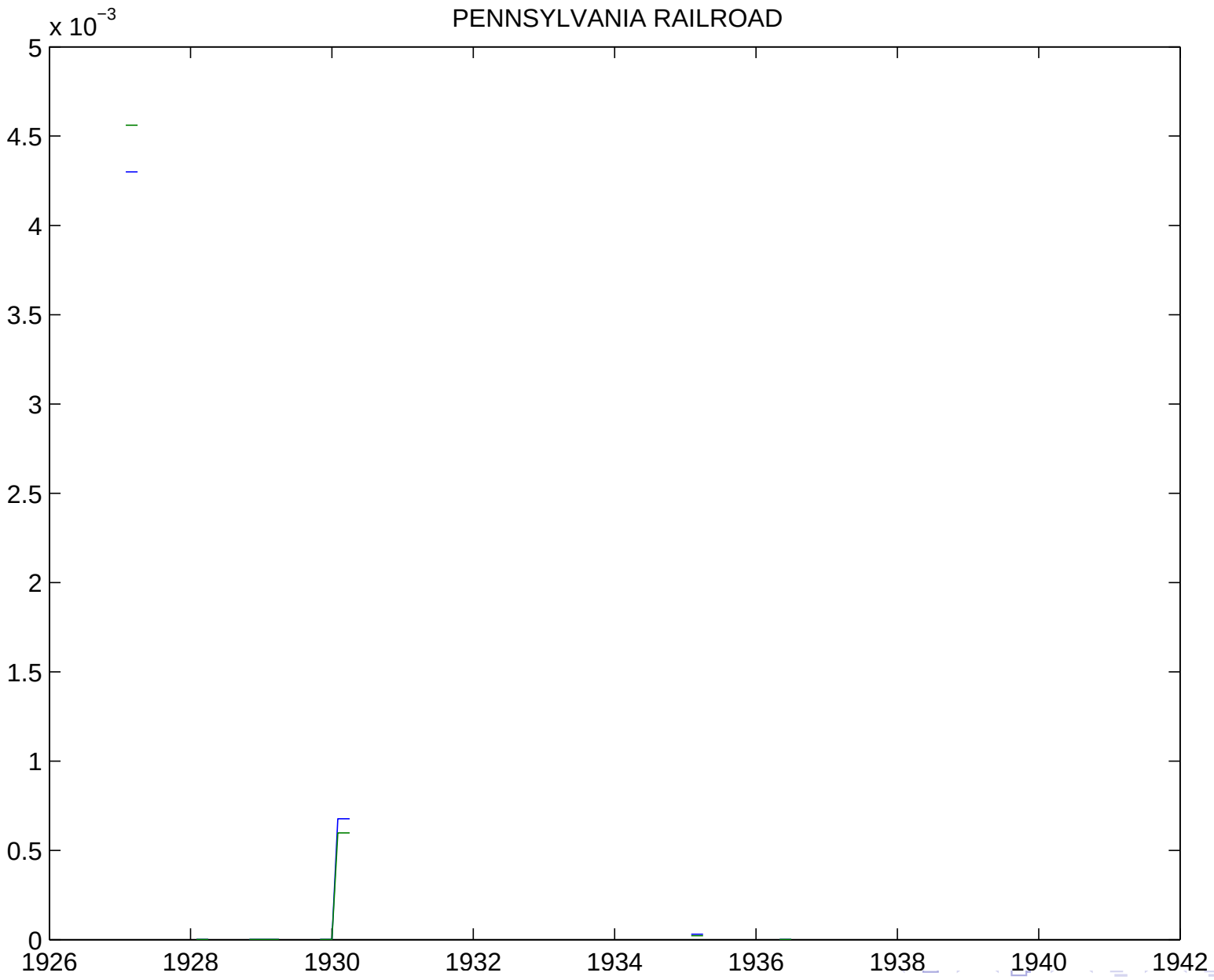
Sample output: Pennsylvania Railroad Snapshot Dec 1931



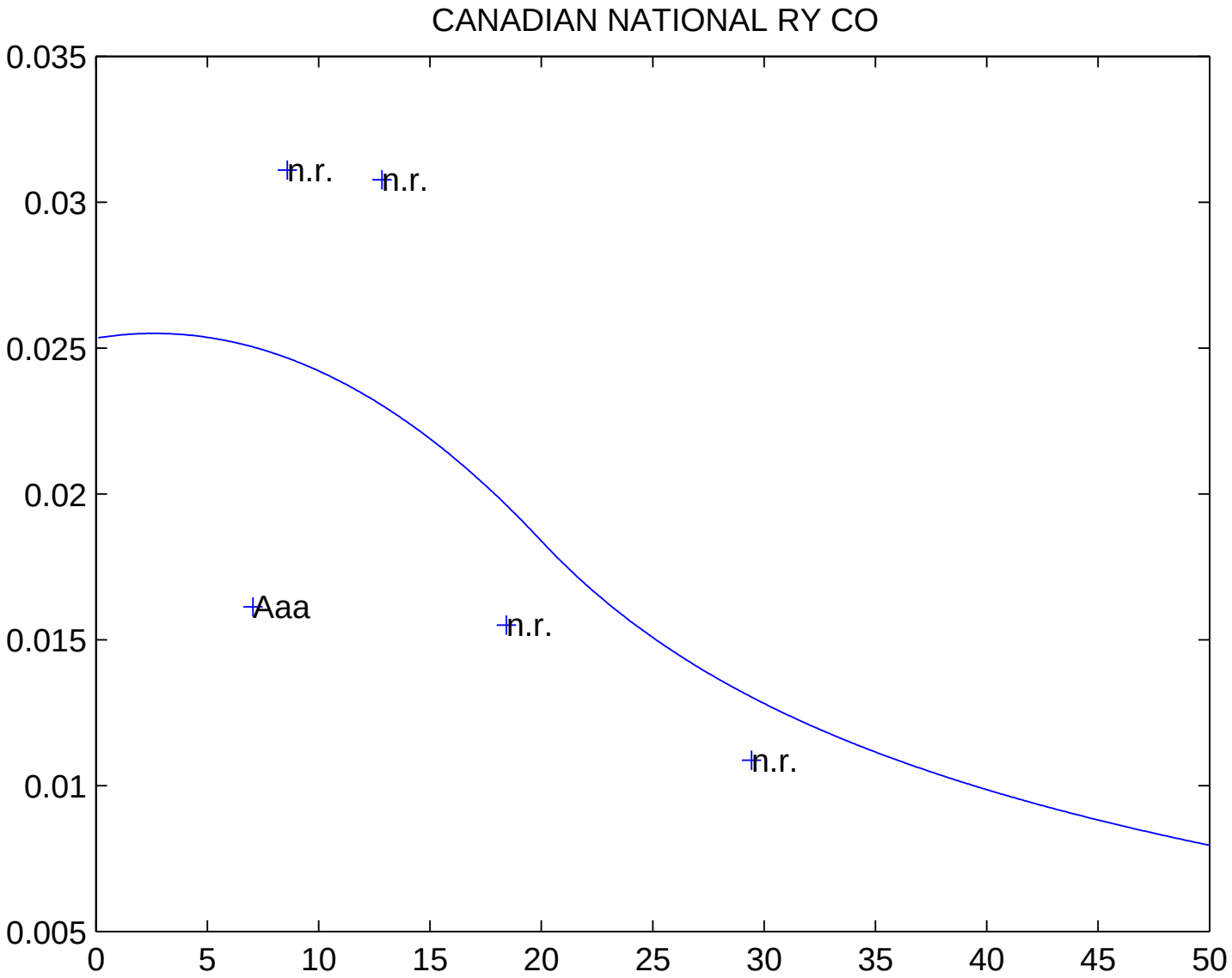
Sample output: Pennsylvania Railroad curves



Sample output: Pennsylvania Railroad volatility



Sample output: Canadian National Railway Snapshot Dec 1927



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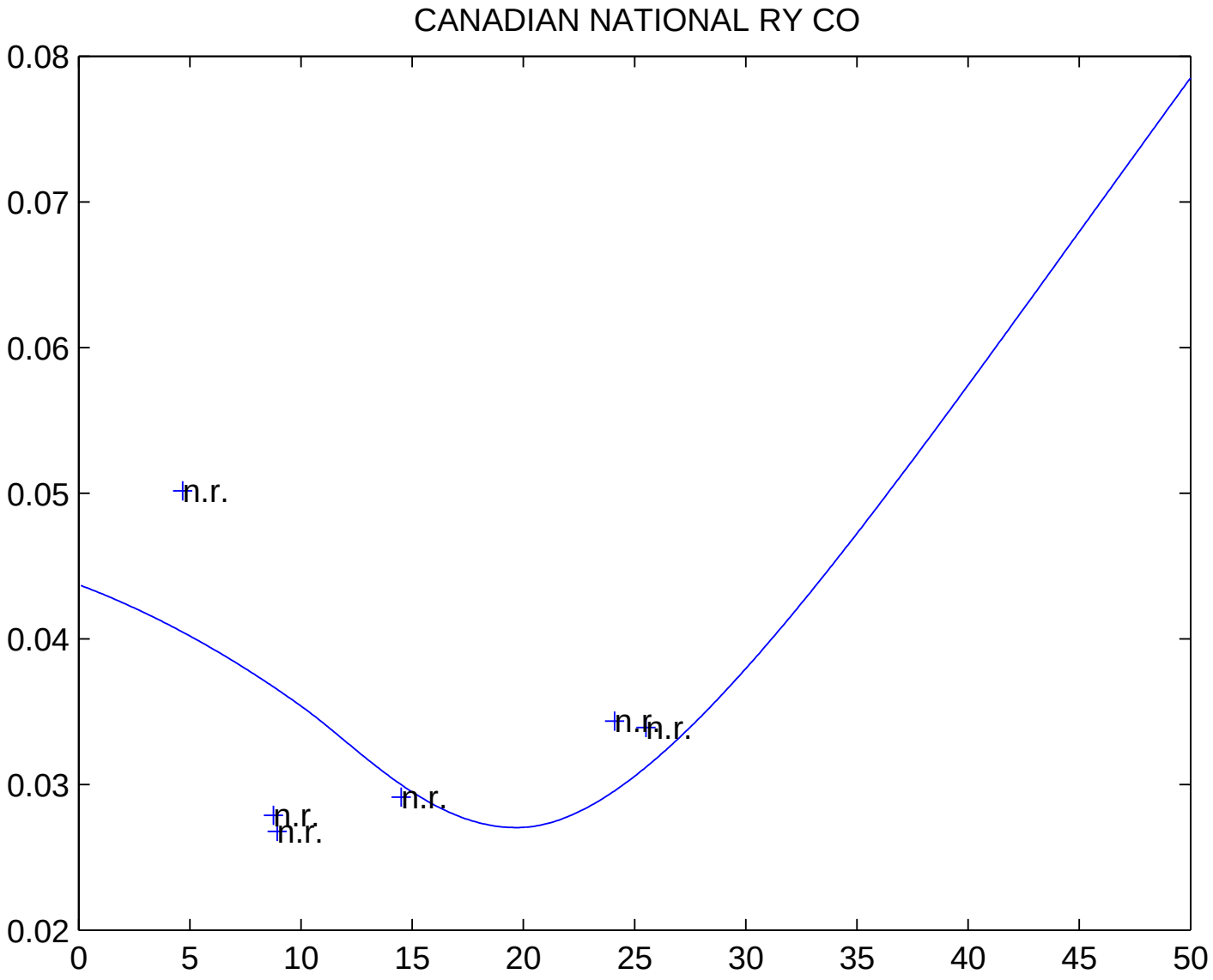
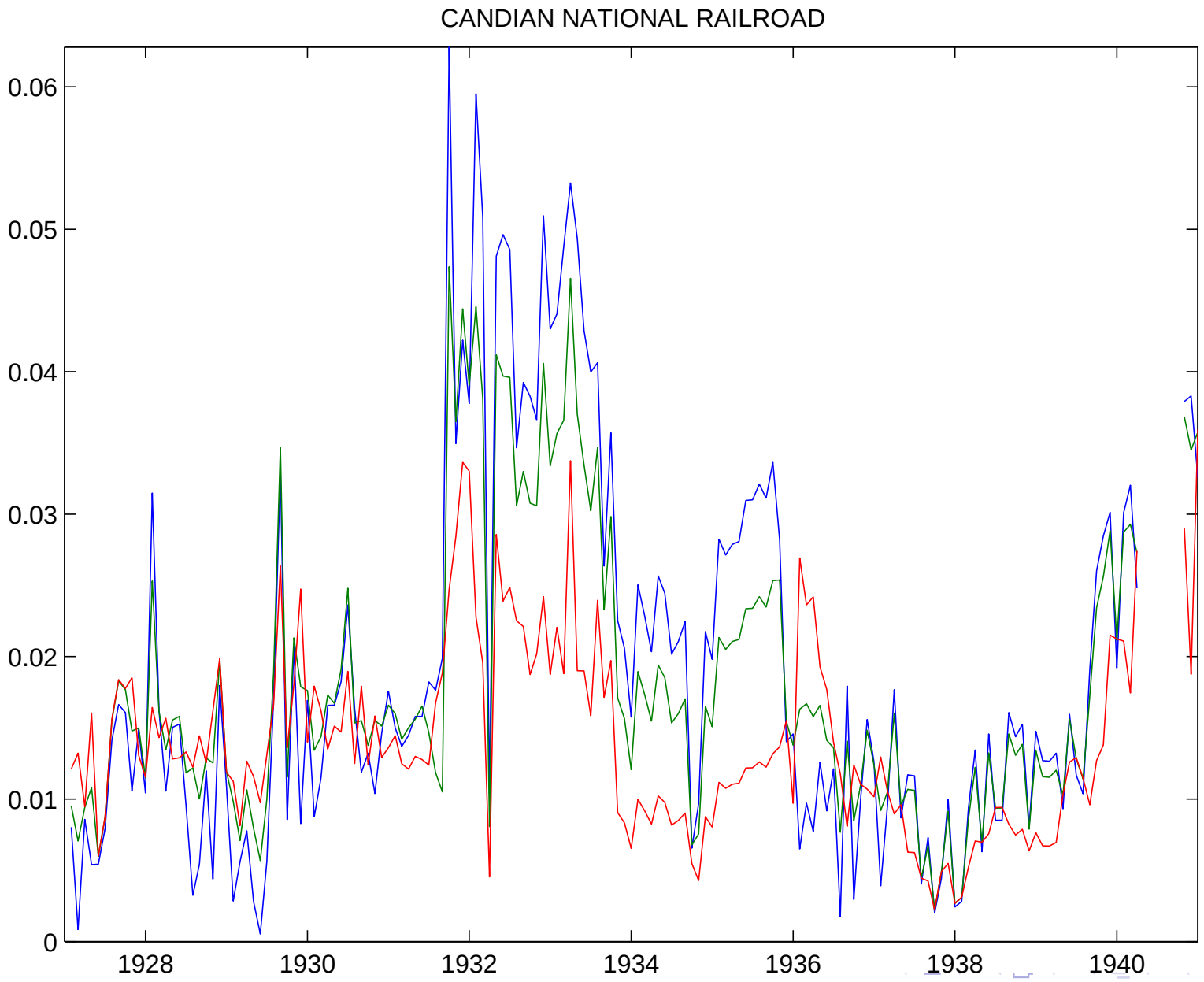


Sample output: Canadian National Railway curves



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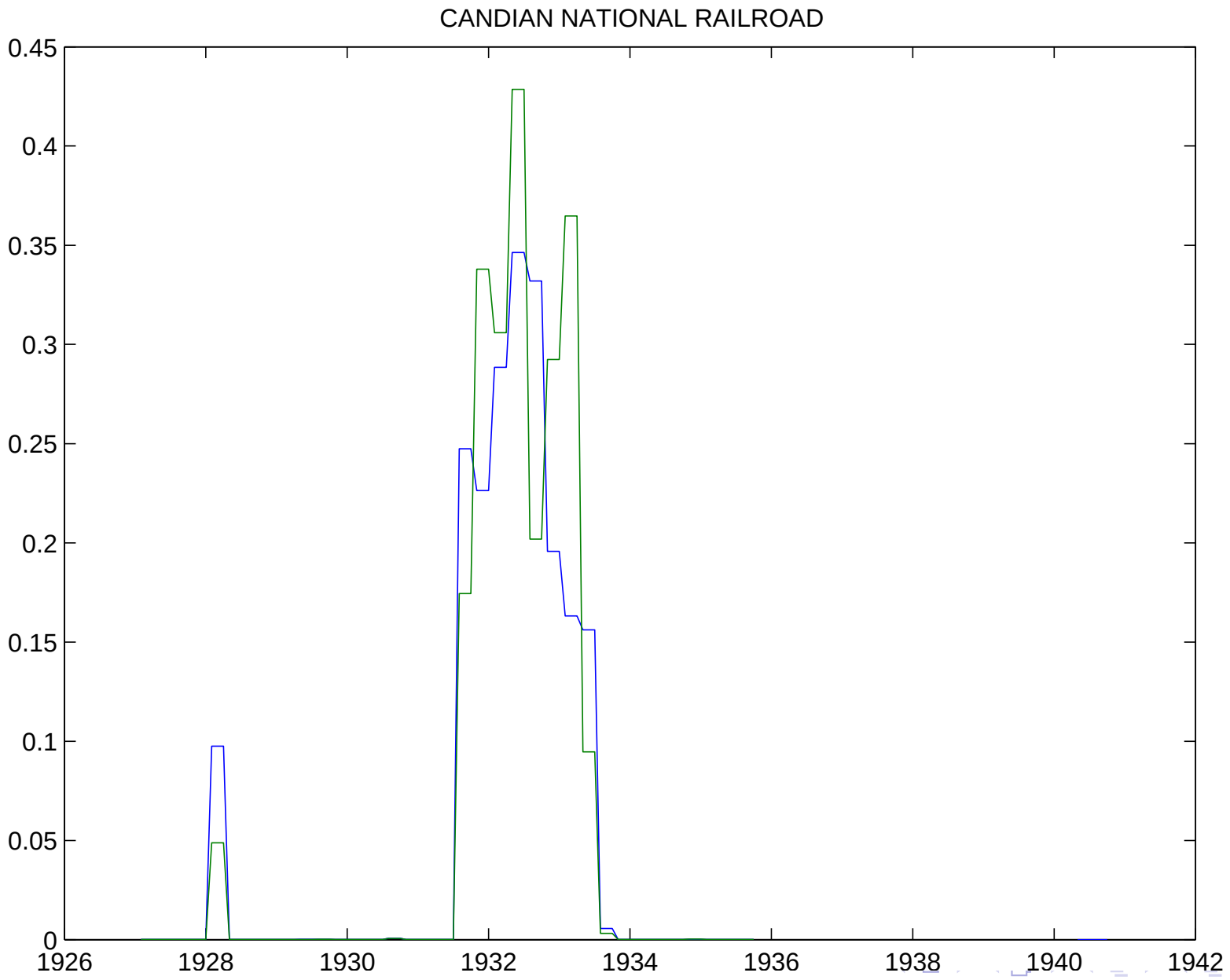

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  - Other suggestions?