1: Setting the scene

Neue Zürcher Zeitung (NZZ)

1. Financial market data

   - 20th century returns

   - US exceptionalism

2. Issues in financial archeology

3. Five big questions

4. Conclusions

Equity outperformance

Asset Class	Annualized Return
Stocks	6.9%
Bonds	3.6%
Bills	2.5%
Gold	0.6%
US Dollar	-1.4%

Stocks $2,334,920
Bonds $2,163
Bills $245
Gold $4.06
US Dollar $0.043
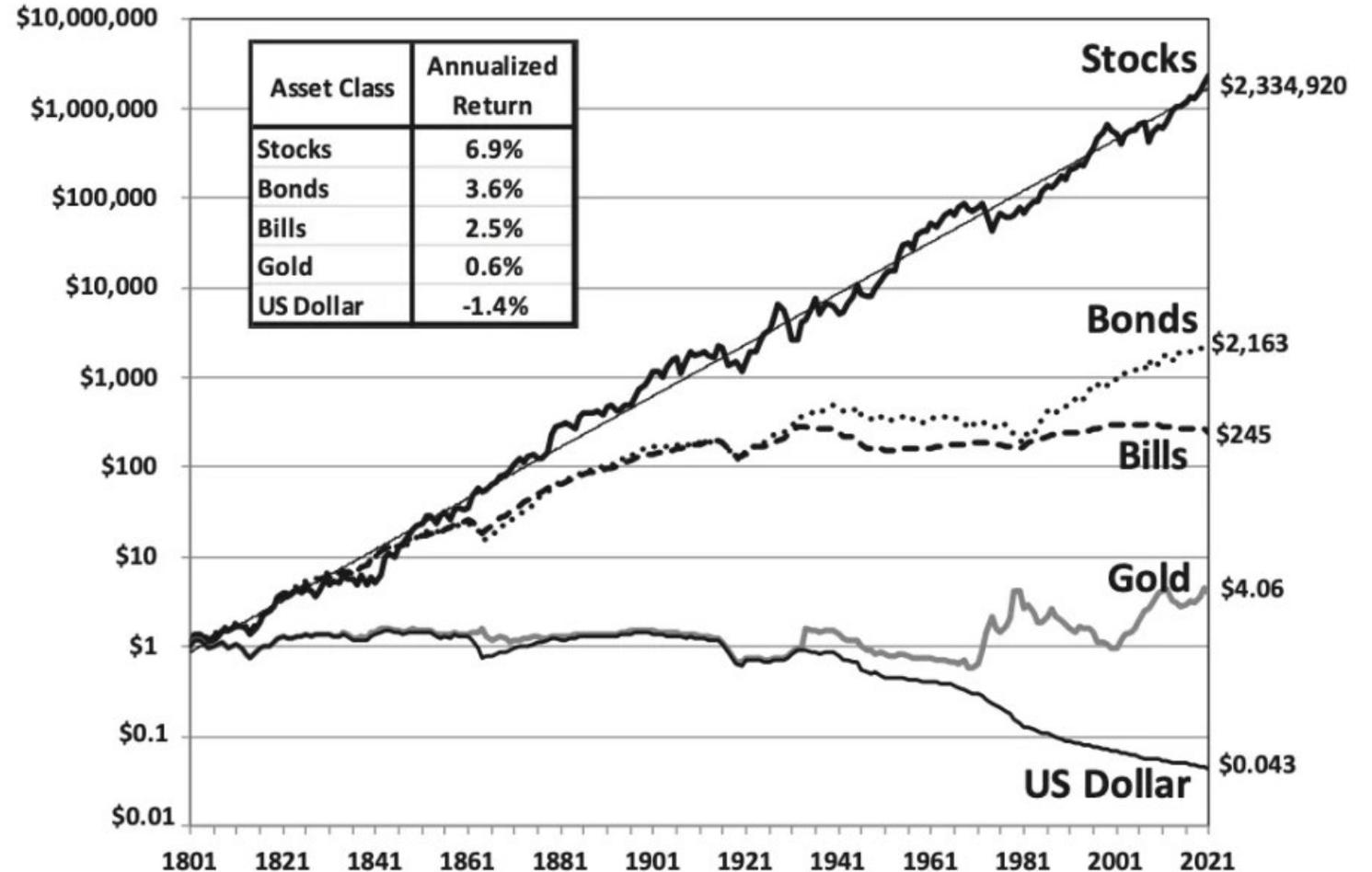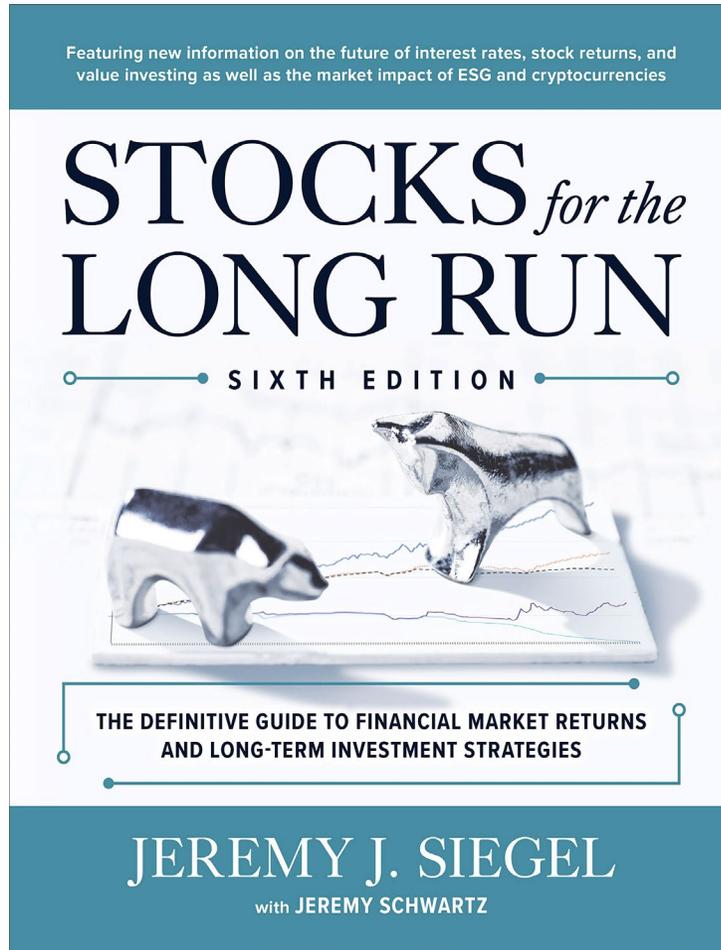
A widely cited chart… but how strong is the evidence behind Stocks for the Long Run?

American exceptionalism

Annualized real USD return (%)

	1900–1999	2000–2020	2009–2020	2020 only
	EUR 4.7, WXU 4.9, JPN 5.4, WLD 5.6, GBR 5.8, USA 7.0	JPN −0.2, GBR 1.1, EUR 2.5, WXU 2.8, WLD 3.7, USA 4.6	JPN 5.6, GBR 5.8, EUR 6.6, WXU 7.0, WLD 9.7, USA 12.6	GBR −8.4, EUR 4.9, WXU 10.4, JPN 11.6, WLD 15.0, USA 18.9
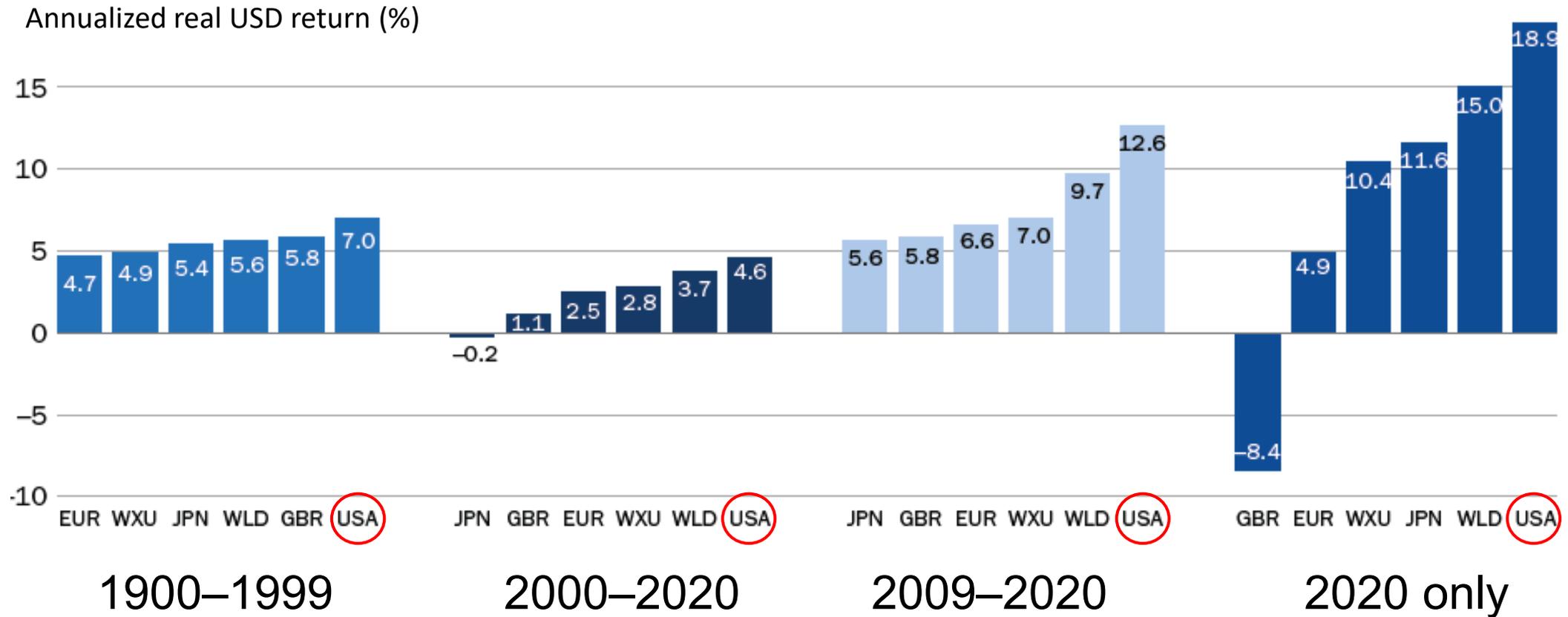
It is helpful to look at out-of-sample markets and at out-of-sample periods

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Source: Dimson-Marsh-Staunton, American exceptionalism, *Journal of Portfolio Management* 2021. Exhibit 8

Real returns 1900–2022

Annualized real USD return (%)

Historical equity risk premium vs. bonds = 3.3%

Historical equity risk premium vs. bills = 4.6%

■ Equities ■ Bonds ■ Bills
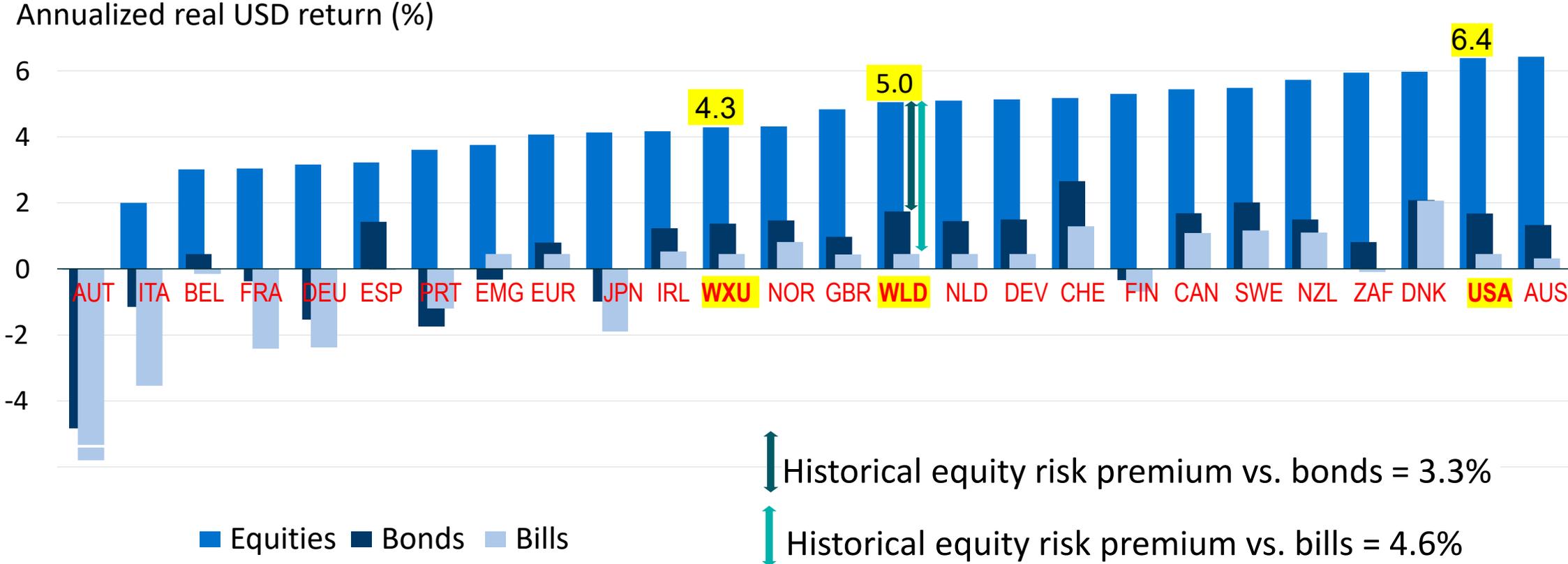
Non-US data shrinks the estimated equity premium. Can we learn more from history?

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2: Issues in financial archaeology

Compiling historical datasets

- Easy data

- Weighting

- Macro-consistency

- Replicability

- Total returns
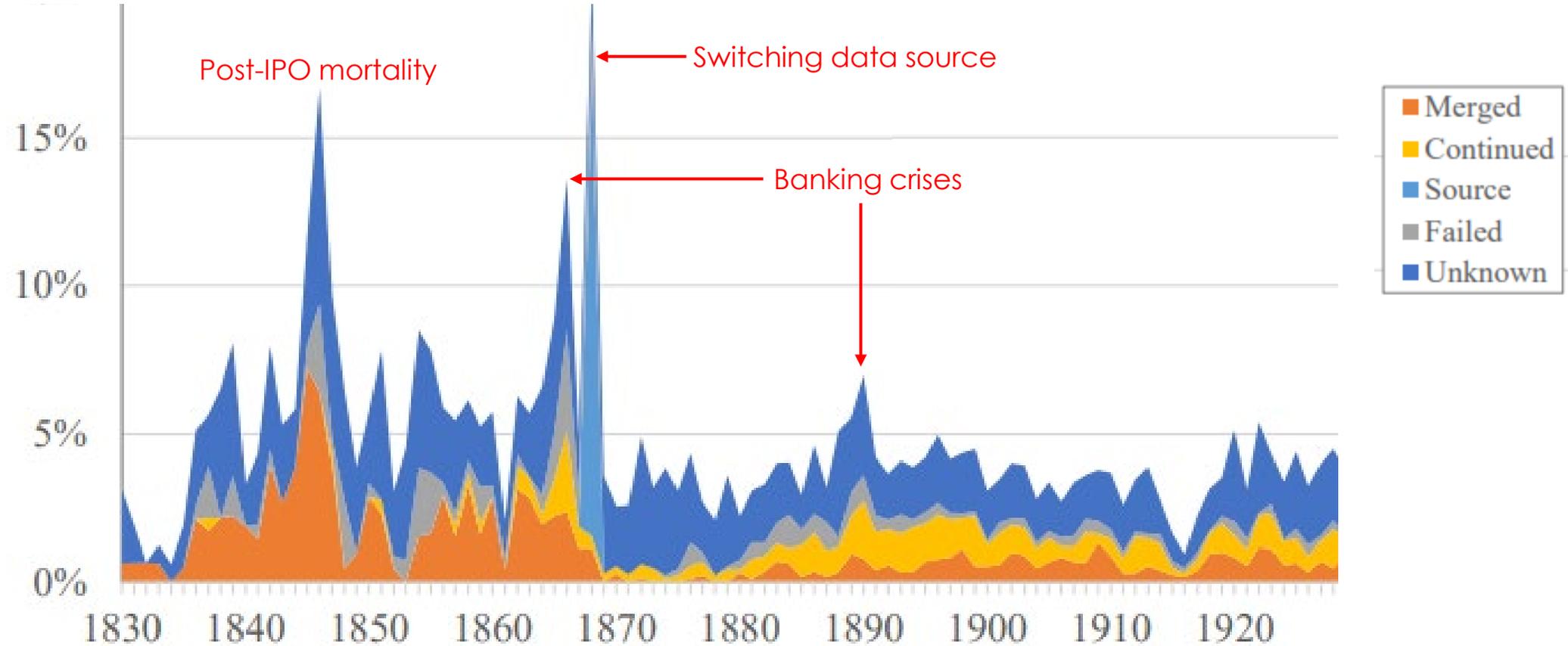
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Easy-data bias

The chart shows a logarithmic y-axis (0.1, 1, 10, 100, 1000) and x-axis years from 1793 to 1893.

Siegel estimate of real US stock returns (dotted line)

Siegel omitted the collapse of the 2nd Bank of the United States → (red circle ~1838-1843)

McQuarrie estimate of real US stock returns (blue line)
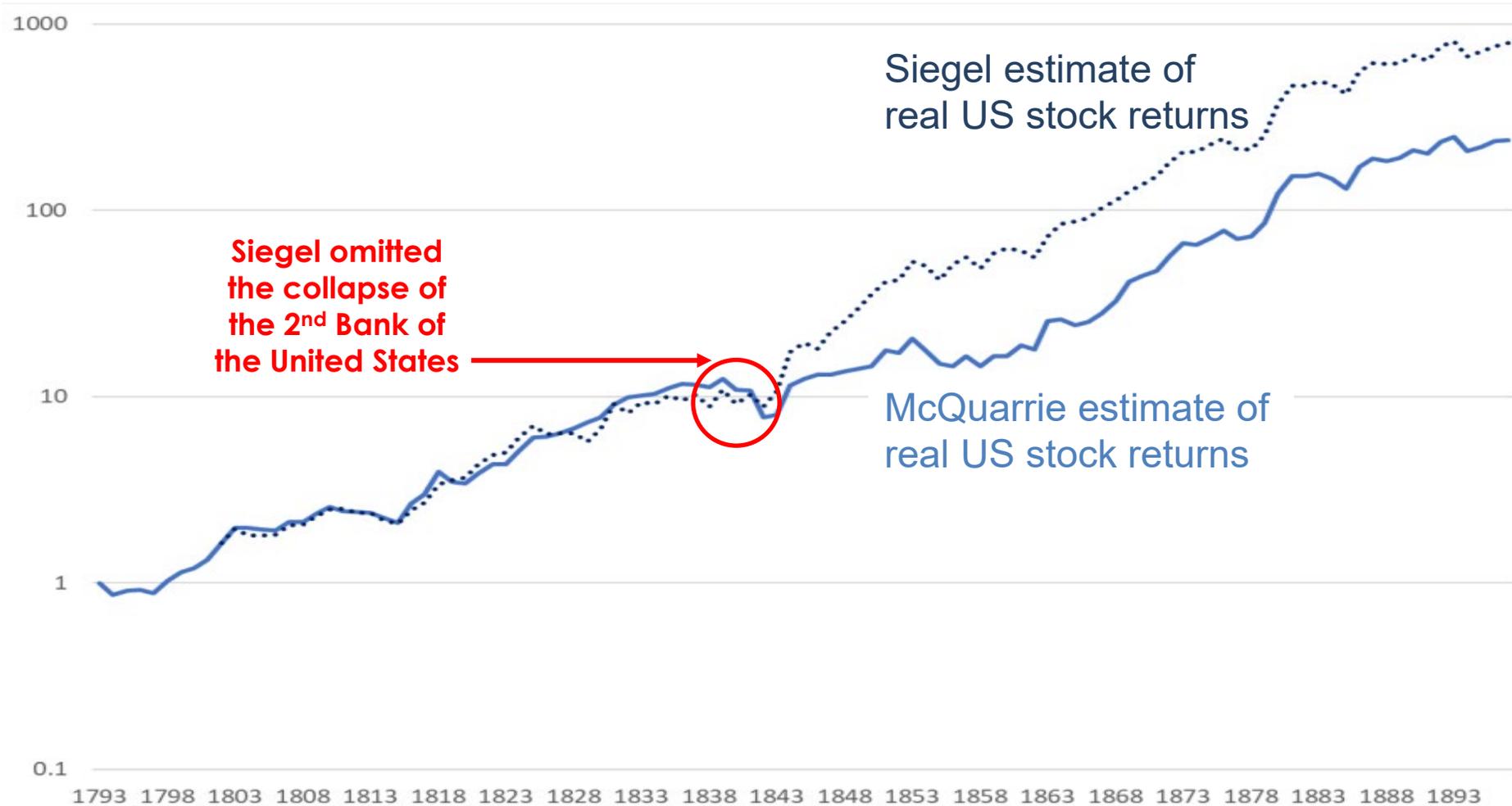
The 2nd BUS was 30% of the US stock market prior to the 1837 bank panic

Source: McQuarrie, Stocks for the long run? Sometimes Yes. Sometimes No. *Financial Analysts Journal* 2024 forthcoming

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Survivor bias

UK companies delisted from CoE and IMM

Post-IPO mortality

Switching data source

Banking crises

Legend: Merged, Continued, Source, Failed, Unknown

Stock disappearances are a major challenge for financial archaeologists
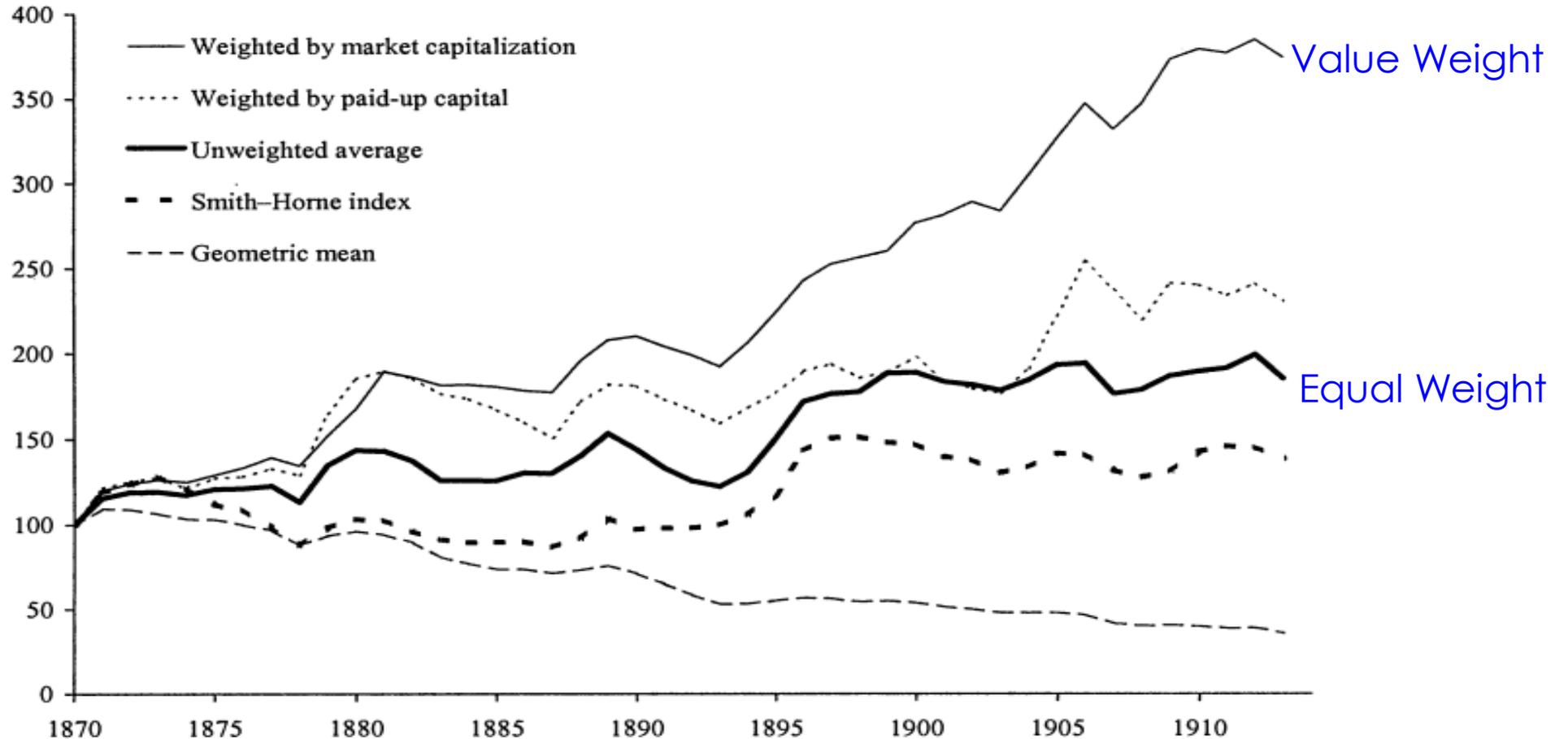
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Index breadth
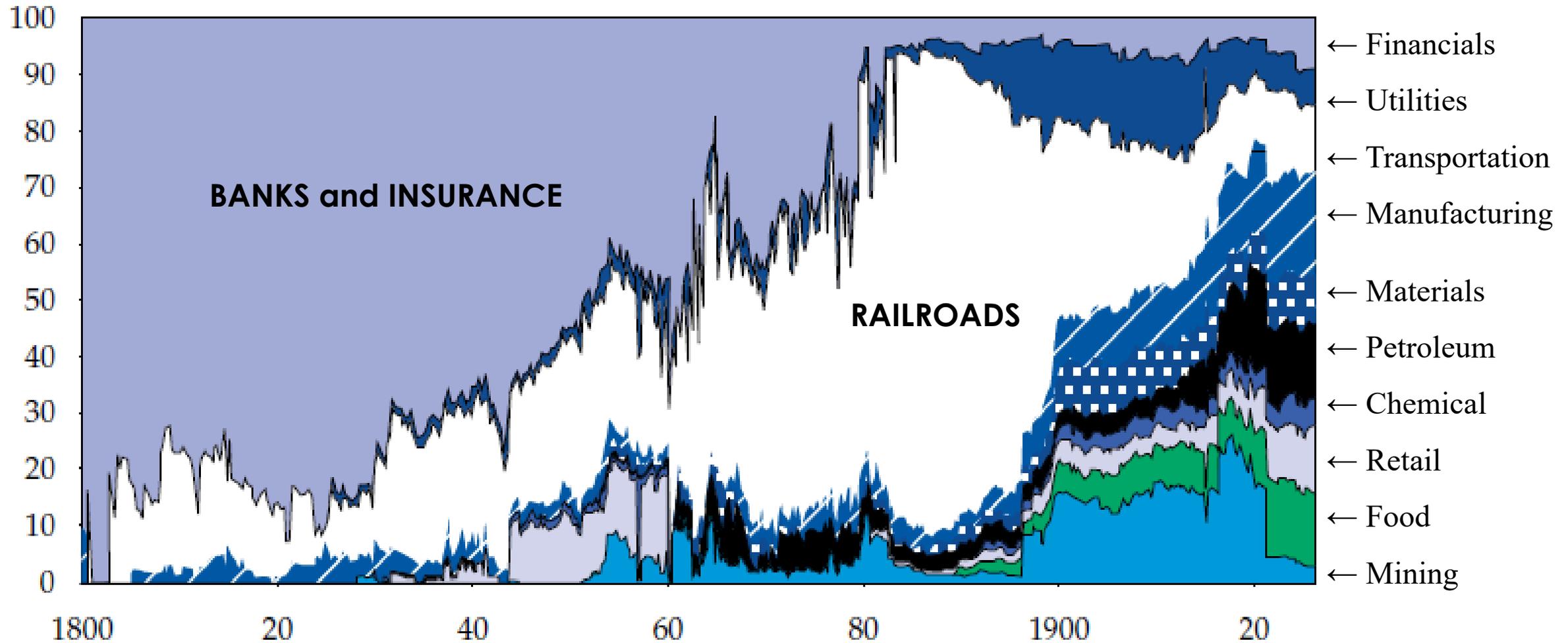
During most of the 19th century, the US "market" comprised just two sectors

Index weighting

UK Stock Market:
price-only returns
1870-1913

Value Weight

Equal Weight

The index weighting scheme can have a big impact on return estimates

Index rebalancing

Buy 10 stocks for 10 guilders each

Amsterdam's EW index:

1983 base value = 100

One of the stocks halves

Return = –50% for the one share

other shares are unchanged

Return = –5% for the EW index portfolio

Index = 100 – 5% = 95

Next day, the stock recovers to 10 guilders

Return = +100% for the one share

other shares are unchanged

Return = +10% for the EW index portfolio

Index = 95 + 10% = 104.5

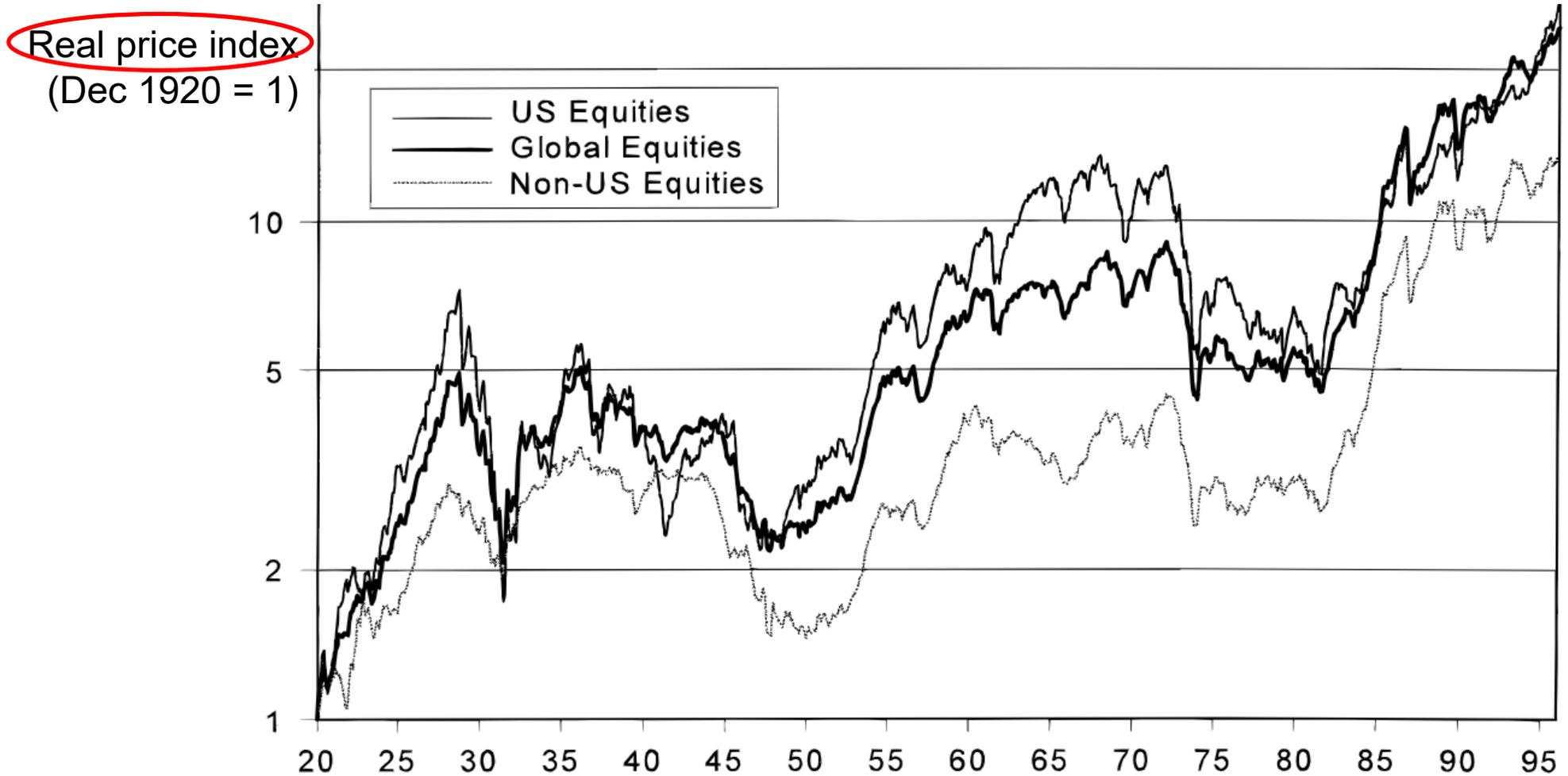The EW index was not macro-consistent and violated Dutch law; it was replaced

Contractual vs realised income

"Middle Cliston" farm, rents paid to Kings College, Cambridge in 1926

For all financial assets, it is important to measure income that is actually received

Total returns

Real price index
(Dec 1920 = 1)

Legend:
- US Equities
- Global Equities
- Non-US Equities

Jorion & Goetzmann's famous paper on global markets used price indexes

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Index formula

Arithmetic version of the FT 30 index

469.4

340.6

FT 30-share Index

Impact on FT30?
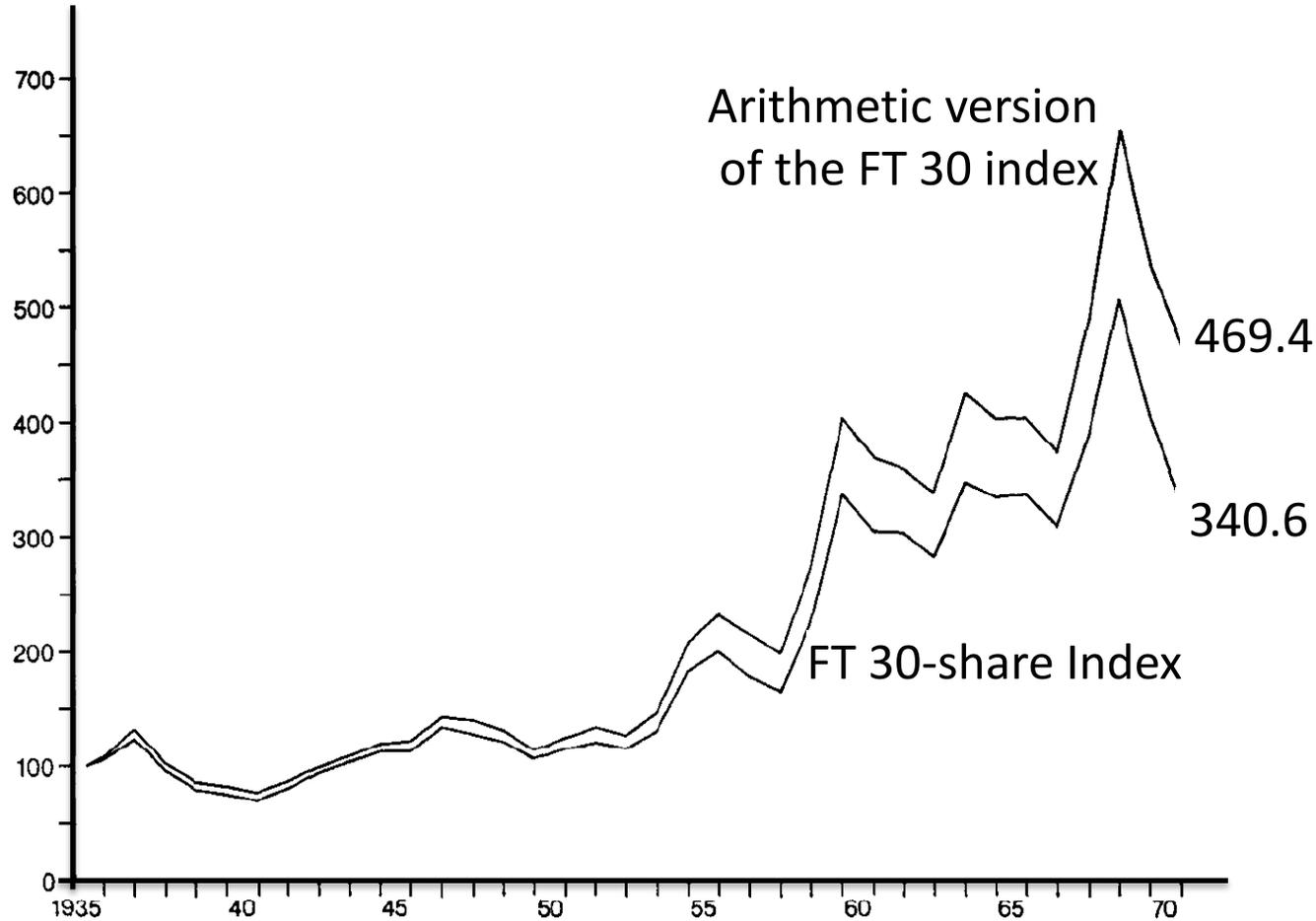
FT30 return = $\sqrt[30]{(\mathcal{P}_1\mathcal{P}_2\ldots\mathcal{P}_{30})} - 1$ where $\mathcal{P}_i$ is today's closing price divided by yesterday's close

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Importance of index design

Calculation of pre-1955 UK equity index	Real return
Barclays Capital published return for 1919–54	**8.79%**
Less Bias from choosing sectors with hindsight	–0.20%
Less Bias from choosing stocks with hindsight	–1.56%
Less Bias from choosing only 30 constituents	–0.22%
Less Bias from incorrect rights-issue adjustment	–0.36%
Less Bias from choosing a post-WW1 start date	–2.62%
= DMS estimate of index return 1900–54	**3.83%**

After DMS revealed the bias, Barclays replaced their misleading index

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3: Five big questions

Evidence on contemporary issues:

- Were 20th century stock returns anomalous?

- How abnormal were recent bond yields?

- What can we say about the credit premium?

- Do housing returns match equities?

- Are commodities rewarded in the long run?

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Do **UK** equities beat bonds?

Annualized % nominal returns	Equities		Government bonds		Equity premium vs bonds	
	GFD	DMS+	GFD	DMS+	GFD	DMS+
1800-1899	5.5	5.5	4.0	4.0	1.4	1.5
1900-1999	10.1	10.2	4.9	5.4	5.0	4.6
2000-2022	4.5	4.4	3.7	3.9	1.1	0.5
1800-2022	7.4	7.5	4.4	4.6	2.9	2.7

Equity index definitions:

GFD: Large stocks at first, then ≤100 largest 1850-1983, then FTSE100 index 1984-date

DMS+: Golez-Koudijs 1800-29, Campbell-Grossman-Turner 1830-99, and DMS1900-date

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Do **US** equities beat bonds?

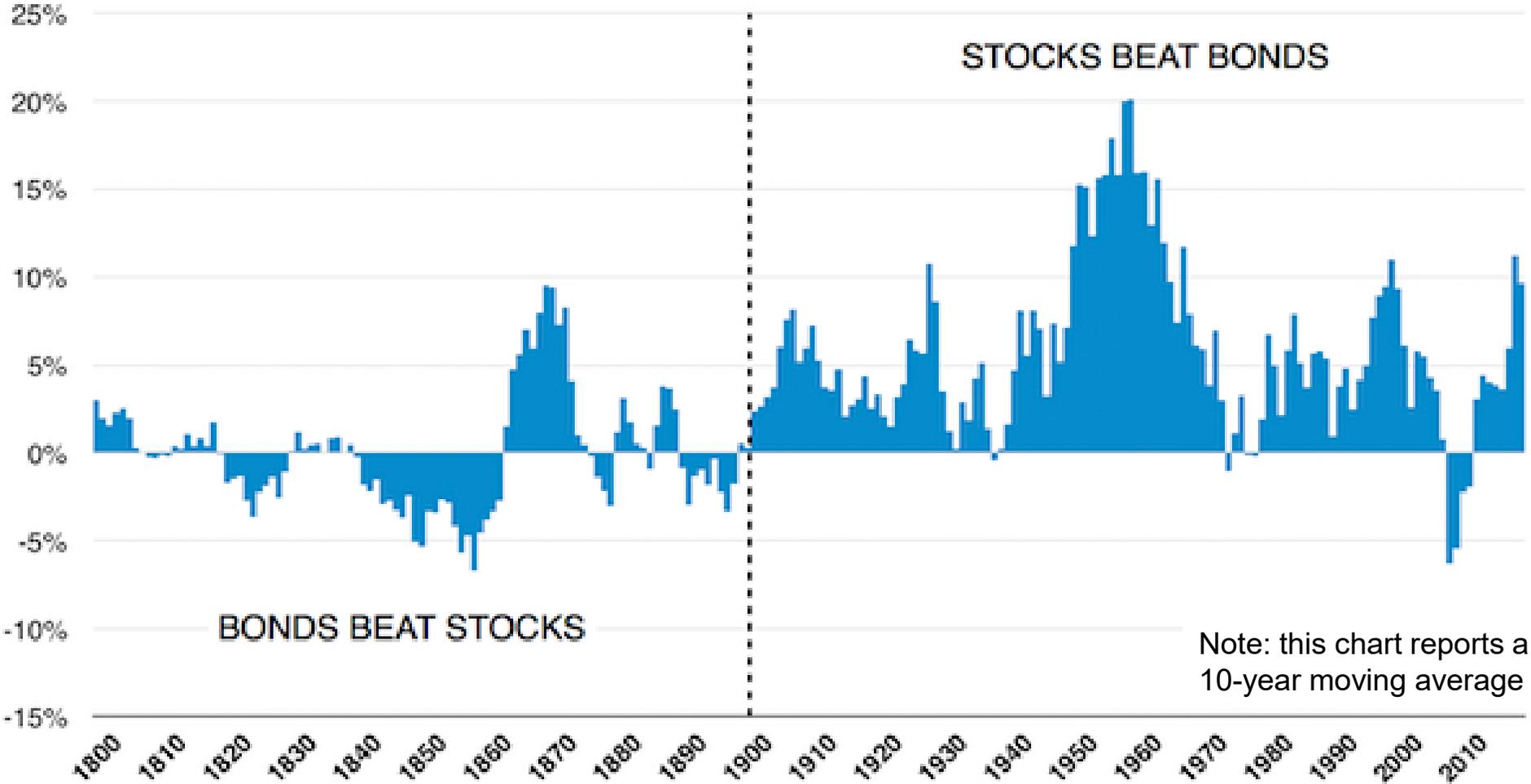| Annualized % nominal returns	Equities		Government bonds		Equity premium vs bonds	
	GFD	DMS+	GFD	DMS+	GFD	DMS+
1800-1899	6.8	5.5	5.5	6.2	1.2	–0.6
1900-1999	11.2	10.3	4.4	4.5	6.5	5.5
2000-2022	5.5	6.2	4.0	5.3	1.5	0.9
1800-2022	8.6	7.7	4.9	5.3	3.6	2.2

Equity index definitions:

GFD: Large stocks till 1825, 50 largest 1825-50, 100 largest 1850-date (cap-weighted)

DMS+: McQuarrie 1800-99, Wilson-Jones (cap-weighted) 1900-25, CRSP 1926-2022

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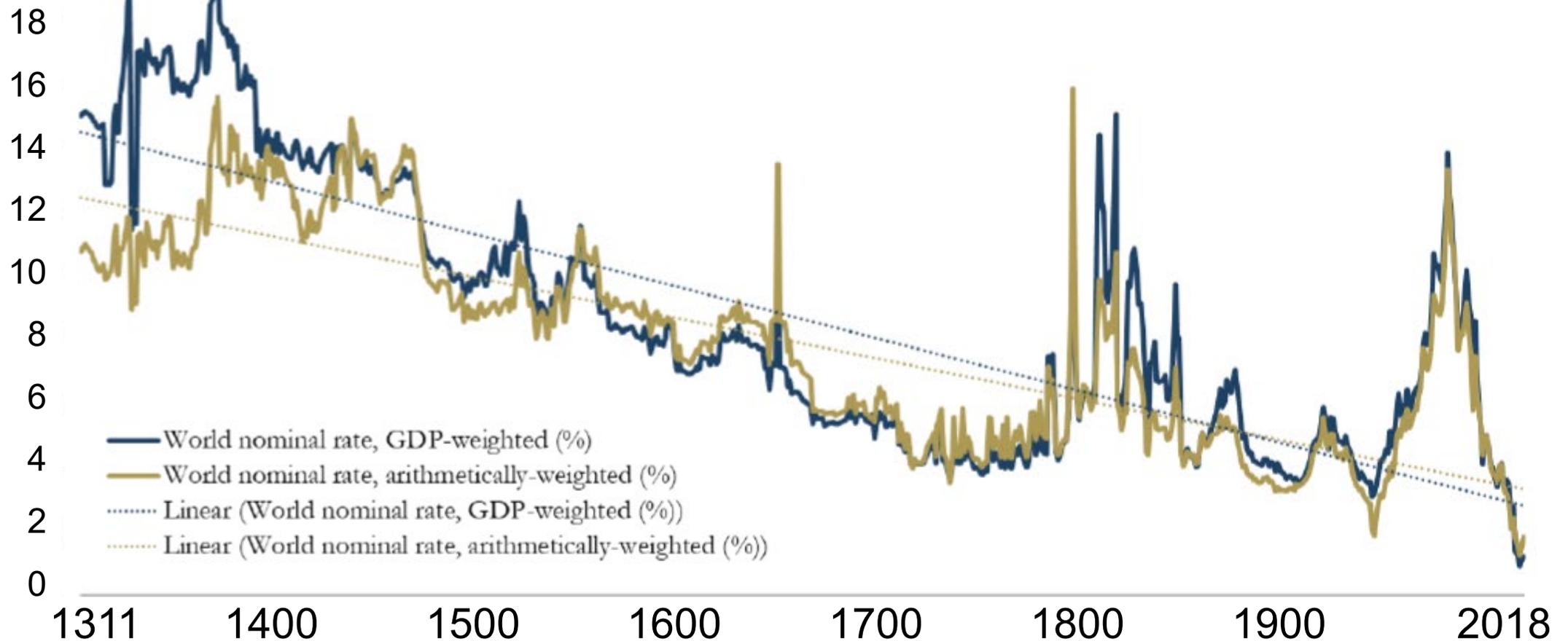
Stocks for the long run?

US stock minus US bond return

25%
20%
15%
10%
5%
0%
-5%
-10%
-15%

STOCKS BEAT BONDS

BONDS BEAT STOCKS

Note: this chart reports a 10-year moving average

1800 1810 1820 1830 1840 1850 1860 1870 1880 1890 1900 1910 1920 1930 1940 1950 1960 1970 1980 1990 2000 2010

Edward McQuarrie's reply in 2024 *FAJ* is: "Sometimes Yes, Sometimes No."

Will yields normalize?

Nominal bond yield (%)

Legend:
— World nominal rate, GDP-weighted (%)
— World nominal rate, arithmetically-weighted (%)
······ Linear (World nominal rate, GDP-weighted (%))
······ Linear (World nominal rate, arithmetically-weighted (%))

Schmelzing: 'Evidence does not support those that see an eventual return to 'normalized' levels'

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Corporate bond defaults, USA1866–2008

Value-weighted default rate for bonds issued by domestic non-financial firms
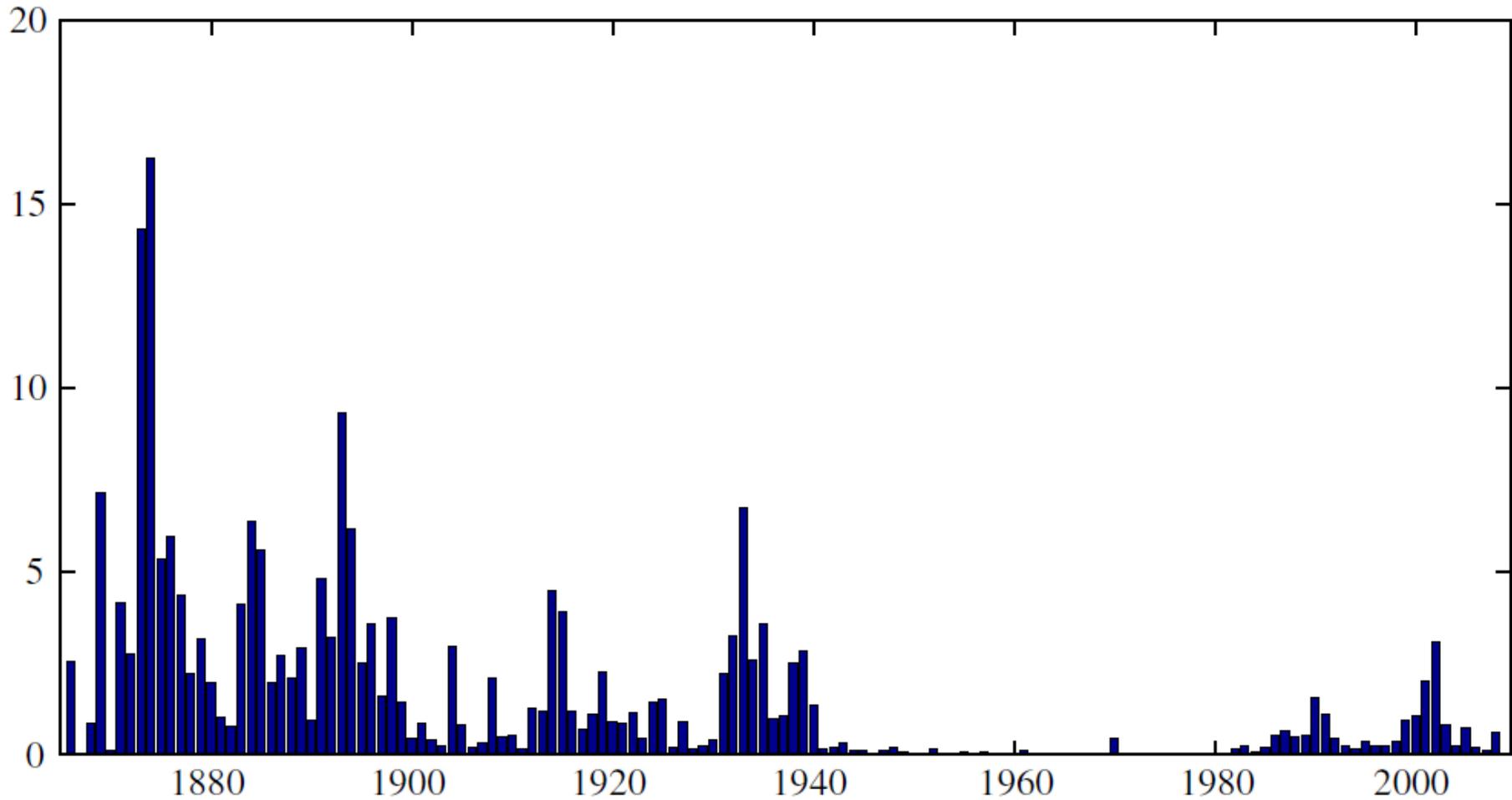
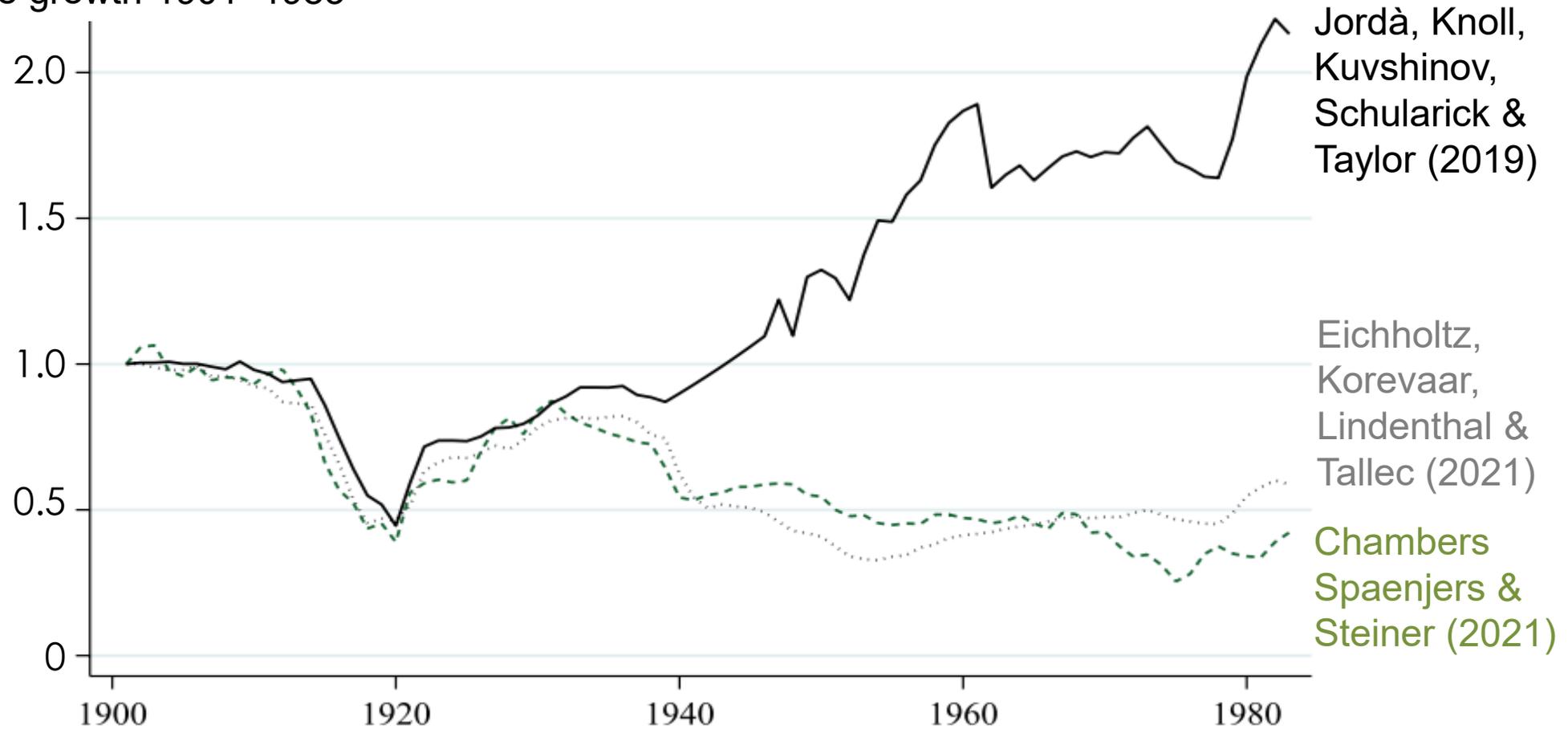Spread of about 0.80% over govts. Average default rate 0.9%. Recovery rate of 50%

Housing return and risk

	Real returns			
	Bills	Bonds	Equity	Housing
Panel A: Full sample				
Mean return p.a.	1.03	2.53	6.88	7.06
Standard deviation	6.00	10.69	21.79	9.93
Geometric mean	0.83	1.97	4.66	6.62
Mean excess return p.a.		1.51	5.85	6.03
Standard deviation		8.36	21.27	9.80
Geometric mean		1.18	3.77	5.60
Observations	1,767	1,767	1,767	1,767

JKKST estimate real return for housing 2% above equities, and with half the risk
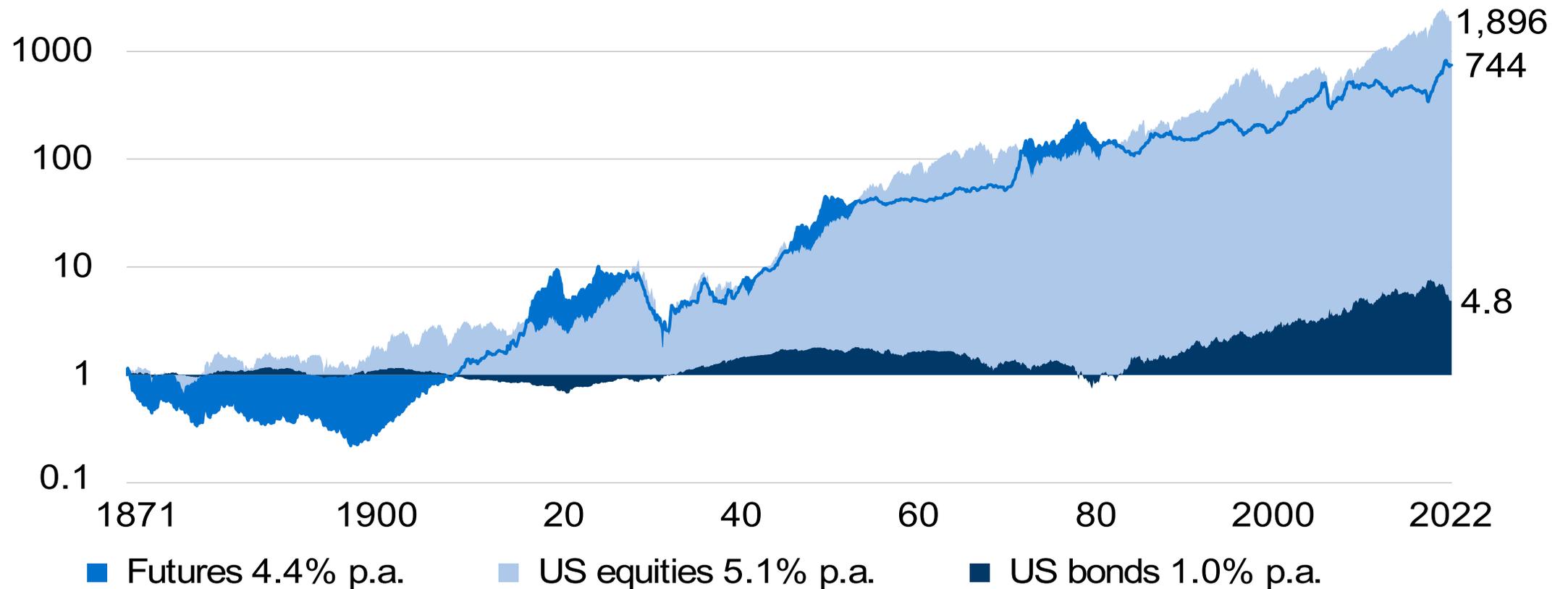
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UK housing returns

Real income growth 1901–1983

Jordà, Knoll, Kuvshinov, Schularick & Taylor (2019)

Eichholtz, Korevaar, Lindenthal & Tallec (2021)

Chambers Spaenjers & Steiner (2021)

House price volatility and financial return estimates should be interpreted with caution

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Commodity futures

Cumulative excess return from an initial investment of USD 1

■ Futures 4.4% p.a.   ■ US equities 5.1% p.a.   ■ US bonds 1.0% p.a.

Substantial risk premium from commodity futures, though less than from US equities

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Commodity drawdowns

Real drawdown (%) from commodity futures
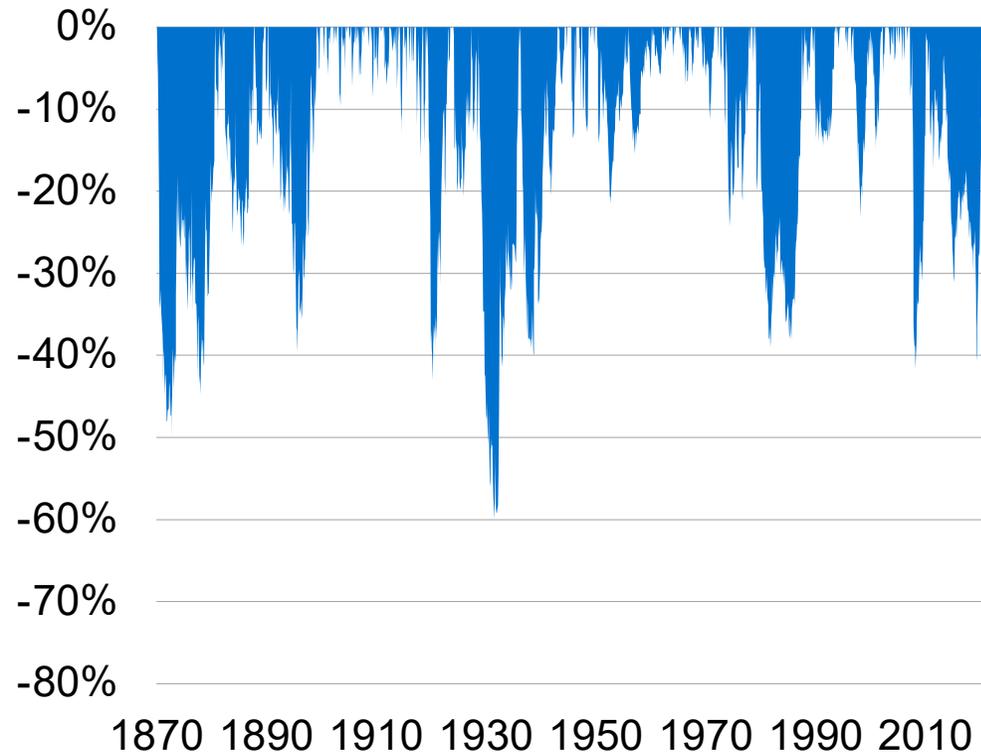
Real drawdown (%) from US stocks
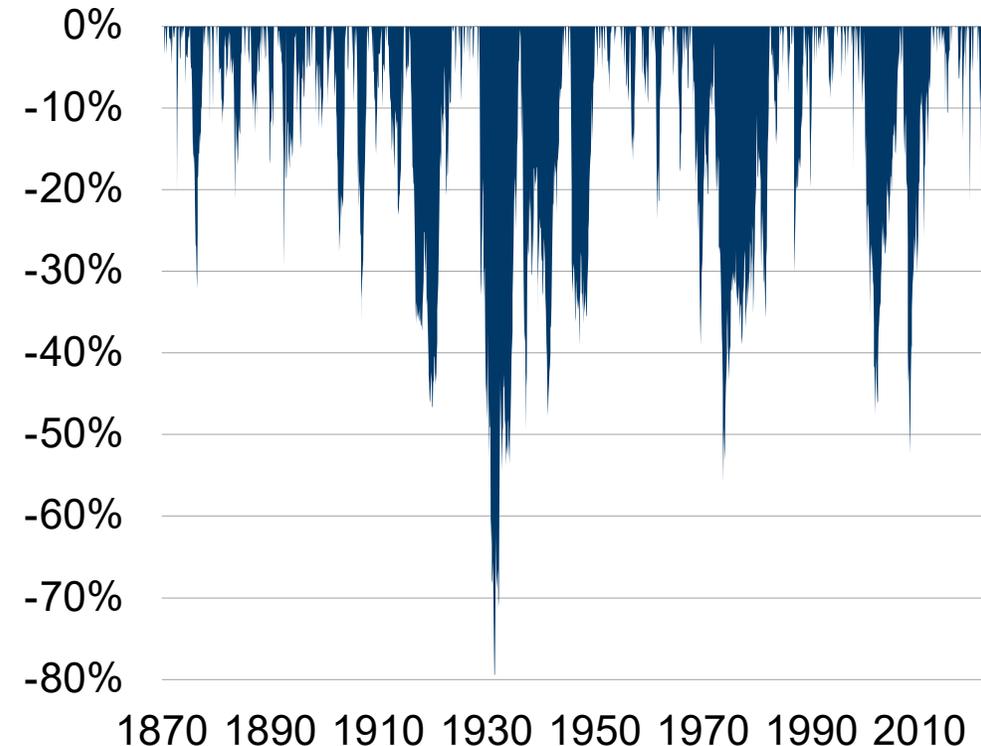
Commodity futures have suffered large and lengthy drawdowns, but so do equities

Source: DMS, *Global Investment Returns Yearbook 2023* Ch8. Data: Commodity futures index Bhardwaj-Janardanan-Rouwenhorst (2019) updated by SummerHaven IM

4: Conclusions

In historical studies report on:

- data sources and measurement choices

- estimation methods and potential biases

- interpolation, back-casting, and infilling

- research design and robustness

- contributions of earlier researchers

Important observations:

- small return differences cumulate to large wealth differences

- equity-bond premium may be a 20th century anomaly

- evidence of a modest credit premium

- housing is not a low-risk, high-return financial asset

- the case for commodity futures