Based on a forthcoming paper, *Long-Run Asset Returns*, by David Chambers and Elroy Dimson (Cambridge University), Antti Ilmanen (AQR), and Paul Rintamäki (Aalto).
1: Setting the scene

1. Financial market data
   - 20th century returns
   - US exceptionalism

2. Issues in financial archeology

3. Five big questions

4. Conclusions
Equity outperformance

A widely cited chart… but how strong is the evidence behind Stocks for the Long Run?

It is helpful to look at out-of-sample markets and at out-of-sample periods.

Real returns 1900–2022

Historical equity risk premium vs. bonds = 3.3%

Historical equity risk premium vs. bills = 4.6%

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

Source: Dimson-Marsh-Staunton ‘Long-Run Asset Returns’ Global Investment Returns Yearbook 2023. Figure 11
2: Issues in financial archaeology

Compiling historical datasets

- Easy data
- Weighting
- Macro-consistency
- Replicability
- Total returns
Easy-data bias

The 2nd BUS was 30% of the US stock market prior to the 1837 bank panic

Survivor bias

UK companies delisted from CoE and IMM

Stock disappearances are a major challenge for financial archaeologists

During most of the 19th century, the US “market” comprised just two sectors.
Index weighting

UK Stock Market: *price-only* returns 1870-1913

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

Source: Grossman, New indices of British equity prices, 1870–1913, *Journal of Economic History* 2002, 62(1): 121–146, Figure 3
Index rebalancing

Buy 10 stocks for 10 guilders each

One of the stocks halves

Next day, the stock recovers to 10 guilders

Amsterdam’s EW index:

1983 base value = 100

Index = 100 – 5% = 95

Return = –50% for the one share
other shares are unchanged
Return = –5% for the EW index portfolio

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)

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

Source: Jorion-Goetzmann, Global stock markets in the twentieth century, *Journal of Finance* 1999. Figure 4.
Index formula

FT30 return = $\frac{1}{30} \sqrt[30]{P_1 P_2 \cdots P_{30}} - 1$ where $P_i$ is today’s closing price divided by yesterday’s close

Sources: Marks-Stuart, An arithmetic version of the FT Ordinary Share Index, *Journal of the Institute of Actuaries* 1971 and *Evening Standard* 4 February 1971
## Importance of index design

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

After DMS revealed the bias, Barclays replaced their misleading index.

3: Five big questions

Evidence on contemporary issues:

• Were 20\textsuperscript{th} 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?
Do UK equities beat bonds?

<table>
<thead>
<tr>
<th>Annualized % nominal returns</th>
<th>Equities</th>
<th>Government bonds</th>
<th>Equity premium vs bonds</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>GFD</td>
<td>DMS+</td>
<td>GFD</td>
</tr>
<tr>
<td>1800-1899</td>
<td>5.5</td>
<td>5.5</td>
<td>4.0</td>
</tr>
<tr>
<td>1900-1999</td>
<td>10.1</td>
<td>10.2</td>
<td>4.9</td>
</tr>
<tr>
<td>2000-2022</td>
<td>4.5</td>
<td>4.4</td>
<td>3.7</td>
</tr>
<tr>
<td>1800-2022</td>
<td>7.4</td>
<td>7.5</td>
<td>4.4</td>
</tr>
</tbody>
</table>

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

Do US equities beat bonds?

<table>
<thead>
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<tr>
<td></td>
<td>GFD</td>
<td>DMS+</td>
<td>GFD</td>
</tr>
<tr>
<td>1800-1899</td>
<td>6.8</td>
<td>5.5</td>
<td>5.5</td>
</tr>
<tr>
<td>1900-1999</td>
<td>11.2</td>
<td>10.3</td>
<td>4.4</td>
</tr>
<tr>
<td>2000-2022</td>
<td>5.5</td>
<td>6.2</td>
<td>4.0</td>
</tr>
<tr>
<td>1800-2022</td>
<td>8.6</td>
<td>7.7</td>
<td>4.9</td>
</tr>
</tbody>
</table>

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

Stocks for the long run?

US stock minus US bond return

Edward McQuarrie’s reply in 2024 FAJ is: “Sometimes Yes, Sometimes No.”

Schmelzing: ‘Evidence does not support those that see an eventual return to ‘normalized’ levels’
Spread of about 0.80% over govts. Average default rate 0.9%. Recovery rate of 50%
Housing return and risk

<table>
<thead>
<tr>
<th>Real returns</th>
<th>Bills</th>
<th>Bonds</th>
<th>Equity</th>
<th>Housing</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean return p.a.</td>
<td>1.03</td>
<td>2.53</td>
<td>6.88</td>
<td>7.06</td>
</tr>
<tr>
<td>Standard deviation</td>
<td>6.00</td>
<td>10.69</td>
<td>21.79</td>
<td>9.93</td>
</tr>
<tr>
<td>Geometric mean</td>
<td>0.83</td>
<td>1.97</td>
<td>4.66</td>
<td>6.62</td>
</tr>
<tr>
<td>Mean excess return p.a.</td>
<td>1.51</td>
<td>5.85</td>
<td>6.03</td>
<td></td>
</tr>
<tr>
<td>Standard deviation</td>
<td>8.36</td>
<td>21.27</td>
<td>9.80</td>
<td></td>
</tr>
<tr>
<td>Geometric mean</td>
<td>1.18</td>
<td>3.77</td>
<td>5.60</td>
<td></td>
</tr>
<tr>
<td>Observations</td>
<td>1,767</td>
<td>1,767</td>
<td>1,767</td>
<td>1,767</td>
</tr>
</tbody>
</table>

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

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

Commodity drawdowns

Commodity futures have suffered large and lengthy drawdowns, but so do equities

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