Institutional Investors
The history of professional fund management

eabh in cooperation with Schroders and Banque Lombard Odier

26 October 2018, London, UK
INSTITUTIONAL INVESTORS DOMINATE CAPITAL MARKETS

Source: CitiUK, OECD, IMF, Own calculations

Dr Hugo Bänziger - 26th October 2018 - 2
Our Social Safety Network

Evolution of institutional investors AuM by type (USD trn)

Source: CitiUK, OECD, IMF, Own calculations
PRIVATE OWNERSHIP SHRINKS

Ownership of Corporate Equity Market

- Households 37%
- Mutual Funds 24%
- ETFs 5%
- Pension Funds 13%
- International Investors 15%
- Hedge Funds 3%
- Other 3%

Legend:
- Households
- Mutual Funds
- ETFs
- Pension Funds
- International Investors
- Hedge Funds
- Other
BANKS DELEVERAGE

Dealers inventory trading is at levels of 1998 ....

Ownership of credit assets shifted to Institutional investors

Source: NY Fed, Bloomberg, FDIC
RATES ARE AT RECORD LOW LEVELS

Central Balancesheet expansion (USD trn)

Oficial interest rate drops

Institutional Investors AuM (trn USD)

Source: NY Fed, Bloomberg, FDIC

Source: CitiUK, OECD, IMF, Own calculations
Up to the 1 World War, stocks were owned by wealthy private individuals.
100 years later, institutional investors hold twice as many assets than private individuals.
This development is a result of economic growth, the emergence of a middle class and the aging of society.
After the World War I, pension plans become common. They are society’s answer to longer life expectancy and the large number of never married women.
Insurance companies are a consequence of citizens accumulating wealth which they want to insure.
The driving force are now Mutual funds. As early as 1925, middle class investors started pooling their savings.
Sovereign Wealth Funds are the latest type of institutional investors.
PENSION PLANS TAKE OFF

- Pension plans date back to the 19th century. American Express is the first company to establish a pension plan in 1875.
- The idea catches on slowly. By 1899, there are 19 private pension plans in America, by 1919 around 300 (15% workforce).
- Great Britain & Germany take another route. Bismarck creates an old-age & health insurance in 1889. GB follows in 1908. Both schemes are pay-as-you-go systems. Ret. age is 70.
- The war experience is a great catalyst. Pension plans become common. The US Revenue Act of 1921 resolves that pension income is to be taxed at the time of distribution.
- In 1935, the US Social Security Act establishes 65 as ret. age.
- In 1946, Great Britain reforms its old-age insurance, making it available to all citizens & combing it with social security.
- In 1947, Switzerland establishes a similar Old-Age Insurance scheme also financed as pay-as-you-go. Private pension plans continue as complementary instruments.
- By 1970, pension plans cover 45% of the US workforce (26.3m).
- 1974 Employee Retirement Income Security Act (ERISA)
INSTITUTIONAL INVESTORS
INSURANCE COMPANIES AS FIRST INSTITUTIONAL INVESTORS

- Insurance companies go back to the 18th century when they insure maritime shipping and homes against fire
- Only affluent individuals and corporations can afford insurance
- This starts to change in Europe and the US with the emergence of a larger middle class who is looking for property, casualty and life insurance. People start to have something to lose!
- Many new life insurance companies are established in the 2nd half of the 19th century and are part of the financial innovations which gave us the Credit Mobilier banks
- Frequently, private bankers are the founding fathers of life insurance companies
- Thus, the know-how about funds management transfers easily from the world of banking to the world of insurance
- Insurance companies always need cash for unpredictable pay-outs. As this cash is invested, it becomes an investment portfolio
The modern mutual fund industry starts with the Massachusetts Investor Trust, established in 1924, to save broker fees and to provide small investors with a diversified basket of shares.

By 1925, the US stock market is still fragmented. Tracking performance is a challenge given the lack of disclosure standards.

Moody’s and Standard & Poors provide limited analysis.

By 1929, there are around 700 closed-end and 19 open-end mutual funds with USD 29bn of assets.

The crash of 1929 wipes out most mutual funds. By 1951, there are only 100 mutual funds left.


In 1971, AuM reach USD 48bn. Over 85% are invested in shares.

In the mid 1950s, mutual funds reach Europe, where they were called Fonds or Investment Fonds.

Europe’s post-war reconstruction is mostly financed by banks. Lack of investment opportunities.
INSTITUTIONAL INVESTORS
Sovereign Wealth Funds

- In 1953, the Kuwait Investment Authority (KIA) was established as the first Sovereign Wealth Fund (SWF).
- After 1973, 10 oil exporting countries establish their own SWF to manage their oil and gas incompe for future generations.
- Today more than half of SWF AuM are linked to oil and gas revenues.
- In 1981 Singapore goverment established GIC to manage Singapore's foreign reserves.
- In 1990 Norway established the Government Pension Fund of Norway, nowadays the biggest SWF.
- In 2007 China stablish its SWF (CIC) with AuM of 1 trn USD. It is the third world biggest SWF with almost the same siue as Abu Dhabi SWF created in the 70s.
WHAT EXPLAIN THE STORY OF SUCCESS AFTER THE WORLD WAR

1. Economic Growth and Wealth Creation
2. Technology & Computation
3. Telecomunications
4. Deregulation
5. Ultra low or negative interest rates
The United States demobilised its Armed Forces quickly. America relied on its nuclear force as a strategic deterrent.

The US export industry boomed, trade balance was strongly positive. It became the world’s supplier of goods and allowed it to expand its industry fast. Unemployment dropped to rock bottom. The trade balance was highly positive.

It also benefits from having its own oil which provides abundant and cheap energy.

Infrastructures was modernized: Large suburbs were constructed. Eisenhower resolved to build the famous Interstate Highway System in 1956.

A large US Middle class emerged: Every white family could afford a house, a car, holidays and college education for their children. It was goldilocks time for US citizens. They had savings to invest, goods to insure and time to think about their retirement.

At that time US became the standard setter with US GAAP and US dollar became reserve currency.

Still today US based institutional investors AuM weigh more than 40% of World assets.
Technology is the biggest game changer in the financial industry

As early as in 1962, broker dealers migrate the processing of trading orders to IBM in New York

The arrival of desk top computers allows to automate the entire back-office chain by 1973

As a consequence, brokerage fees start to drop. In the early 1980, fees for a share transaction amounted to 0.25% Twenty years later, it is 0.01%

This progress in technology makes risk management possible

Finally, portfolios can be rebalanced without running exorbitant cost
Fibre optics are a relatively old technology - in 1880, Graham Bell makes calls with his “photophone” over a distance of 200m.

During the 1950s, the first image-transmitting device is created. However, the loss of light is excessive & restricts practical use.

The solution comes with cladding, the coating of fibre glass and the use of semi-conductor lasers in 1962. By 1970, researchers have minimised the light loss to 20dB/km & make it a viable technology.

The US Navy starts using fiberoptics in the early 1970s.

In 1977, the technology becomes commercial when GTE and AT&T install the first optical telephone systems in Boston and Chicago.

In 1980, the Winter Olympics from Lake Placid transmit via fiberoptics.

In 1988, the first trans-Atlantic optic cable is laid.

By 1996, the first trans-Pacific optic cable follows.

By 2007, fibre optic cables carry 99% of communication around the globe with satellites accounting for the remaining 1%.

A modern optical cable easily transmits 100Gb/s.
DEREGULATION
THE END OF THE STRAIGHT JACKET

- 1958 / 1964 Abolishment of capital and currency controls in both EEC and Japan
- 1971 Mutual Funds offer Money Market Accounts
- 1973 Free floating of all major currencies
- 1980 Removal of regulation Q – restrictions on deposit interest rates & I of business restrictions for Savings & Loan Associations
- 1984 Removal of barriers to interstate banking
- 1986 ‘Big Bang’ in City of London
- 1988 Basel Accord on capital; 1995 on market risk
- 1999 Graham-Leach-Billey Act removes Glass-Steagall separation
- 2006 EU Directive on Services in Internal Markets
- The world enters the Great Financial Crisis with a «light touch » regulatory framework
WHAT DOES THIS RISE OF INSTITUTIONAL INVESTORS MEAN?

• Capital market structure?
• Policy implications?
• Impact on citizens?
Pension Policy and the Financial System

DAVID S. SCHARFSTEIN*

May 2018

ABSTRACT

This paper examines the effect of pension policy on the structure of financial systems around the world. In particular, I explore the hypothesis that policies that promote pension savings also promote the development of capital markets. I present a model that endogenizes the extent to which savings are intermediated through banks or capital markets, and derive implications for corporate finance, household finance, banking, and the size of the financial sector. I then present a number of facts that are broadly consistent with the theory and examine a variety of alternative explanations of my findings.

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shareholders.
A Retirement Wealth Gap Adds a New Indignity to Old Age

Many middle-class Americans are financially unprepared for retirement—and that is leading to an array of social ills.

By Jennifer Levitz

Photographs by Rachel Bujalski for The Wall Street Journal

SANTA ROSA, Calif.—On a Saturday morning in retirement paradise, Ken Heyman stepped out to his front porch and found a brown paper bag. Inside was the chopped-off head of a rat.

Mr. Heyman was acting president of the homeowners’ association at Oakmont Village, an enclave in Northern California’s wine country for people age 55 and over. For months, the community had battled over the unlikeliest of topics: pickleball, a game that is a mix of tennis, badminton and ping pong. Some residents wanted to build a pickleball court complex that would cost at least $300,000. Others didn’t, saying they didn’t want to see their dues go up.

Residents shouted at each other at town-hall gatherings. One confrontation got so heated that a resident called the police. The governing board appointed a security guard to keep order at meetings.

For many, of course, the issue wasn’t really about pickleball. It was about a divide that had opened between wealthier residents who moved to the village more recently and the less well-off, who said clubhouse updates, new fees and expensive amenities would be budget-busters.

Mr. Heyman’s predecessor as president was a leader of the anti-pickleball faction. She felt she had been chased out of office by pickleball partisans. On the paper bag was a note.

“You’re next,” it read, according to a police report.

Around 10,000 baby boomers are turning 65 every day, and the same number will continue doing so for years. Some are on solid financial ground after a lifetime of planning and the fortune of well-timed home purchases and stock
A brief history of Schroders and investment management

Caroline Shaw, Historical Archivist

October 2018

For professional investors or advisers only
From Hamburg merchants to London merchant bankers

The Franziska of the Brazilian route
Financing international development
The first railway in Japan, 1870

A steam train at Yokohama by Utagawa Hiroshige III, 1874
Private clients
Anglo-German ties

Princess Christian of Schleswig Holstein (1846-1923), daughter of Queen Victoria
Investing in industry
Continental and Industrial Trust, 1924

Deutsch-Luxemburgische Bergwerks- und Hütten-AG, Dortmund wheel and axle assembly shop, December 1925
Fund management by accident
International Holdings and Hydro-Electric Securities

Artist’s impression of Loewenstein’s aircraft, depicted just after he fell to his death, July 1928. Illustrated London News and The Man who Fell from the Sky (William Norris, 1987)
J. Henry Schroder Wagg

Corporate finance clients

Some of our recent clients

The following is based on the list published in the Issuing House Year Book of companies with which we are associated in issues, mergers and other operations and for which we have done business over the last seven years.

Banks and insurance

Steels
Iron and Steel Investments - Lancashire Steel Corporation Steel Company of Wales - Stewart and Lloyds * John Summers & Sons *

Aircraft, motors and components
Leyland Motors - Pressed Steel Company Rover Company - Westland Aircraft

Oils, chemicals and building
Abbott Laboratories - Berges, Johnson & Nicholson * F.W. Berk & Company - British Paints (Holdings) British Petroleum Company * Commercial Pastics Concrete Building Products - English China Clays Geigy (Holdings) - General Refractories - Mobil Holdings Ready Mixed Concrete (United Kingdom) - George Wimpey & Co.

Paper and printing
International Publishing Corporation * - Penguin Books Reed Paper Group *

Industrials and others

Investment trusts
Aguadish Investment Trust Ashdown Investment Trust - Bradstone Investment Trust Continental and Industrial Trust - Trans Australia Investment Trust Trans Europe Investment Trust Trans-Asian Trust - Westmoreland Investment Trust

Shipbuilders, boilermakers and machine tool manufacturers

Electrical and general engineering

Breweries, wines and spirits
Bass, Mitchells & Butlers * - Matthews Cash & Sons (Holdings) Flemings * - J. Nimuendo and Son - Scottish & Newcastle Breweries John Smith's Exidatores Brewery Company Williamson & Hancock - Whitbread and Company *

Foods and retail trade
Bovril - Great Universal Stores - H.J. Heinz Company Horlicks - Huyton & Co. - Smith's Potato Crisp - Tate & Lyle

* All the above are limited companies
*jointly with others
Has your Superannuation Fund Manager taken these figures into account?

Whilst quarterly performance figures are a useful guide to your superfund’s present position, they reveal little about the figures above.

Yet as history has repeatedly demonstrated, it’s figures like these that dramatically alter financial situations.

Here at Schroder Darling, our world-wide associations enable us to regularly monitor such factors when determining investment policy.

It enables our Investment Division to not only exploit opportunities as they arise, but at the same time plan for long-term security.

It’s this careful balance of growth and future security that has enabled us at Schroder Darling to obtain consistently high results since we commenced our Investment Management Program in 1961.

And it’s a way of doing business you’ll find common to all divisions of Schroder Darling: banking, corporate finance and the investment division.

Considering the ‘cause and effect’ nature of all financial matters, shouldn’t you be talking to a company that does more than just study figures on paper?

Fund management
An evolving business
Asset managers
Sale of investment bank to Citigroup, 2000

Sale of investment bank will see expansion of asset management

Salomon to pay £1.4bn for Schroders division

By Caroline Merrell, banking correspondent

Schroders is selling its investment banking division to America’s Salomon Smith Barney for £3.5 billion. The sale, which ends months of speculation about the future of Schroders, lifted its shares 11.4 per cent to £3.14. Under the terms of the sale Salomon Smith Barney, a

equity business. The restructuring is expected to incur a one-off charge of less than £100 million.

The main beneficiaries will be trusts controlled by the Schroder family, headed by Bruno Schroder. The trusts, which hold 48 per cent of the shares, will receive £432 mil-

Michael Carpenter, left, Salomon Smith Barney chairman, with his Schroders counterpart, Sir Win Bischoff, after announcing the £3.5 billion deal.
Family firm
Schroder family, 1938
Schroders and the 21st century

Timeline

Innovation and strategic development

- **2000**: Sale of the investment bank to Citigroup
- **2001**: Our first responsible investment policy is published
- **2004**: Celebration of our 200th anniversary
- **2005**: Start of joint venture with Bank of Communications in China
- **2006**: Our first diversified growth strategy is launched
- **2007**: Liability driven investment solutions are developed
- **2009**: Launch of GAIA platform for hedge fund investment
- **2011**: Opening of an office in Chile, the 27th country where we have a presence
- **2012**: Entered into partnership with Axis Asset Management in India
- **2013**: Acquisition of Cazenove Capital Holdings
- **2014**: Stake taken in Nutmeg, a UK online investment manager
- **2015**: Launch of our online behavioural finance tool, incomeIQ
- **2016**: Start of strategic relationship with Hartford Funds, a US asset manager
- **2017**: Acquisition of C. Hoare 's wealth manager and Adveq private equity solutions
EARLY INSTITUTIONAL INVESTORS AND THEIR IMPORTANCE FOR THE AMSTERDAM FINANCIAL SYSTEM

EABH/Banque Lombard Odier/Schroders
London 26 October 2018

Joost Jonker

University of Amsterdam/IISH
Contents

• Why bother ?

• The charity origins

• From early Modern to Modern

• The long afterlife of a bright idea
Why bother?

- One of six hallmarks of successful transition to modern finance (Sylla)

- Why some countries earlier than others?

- What consequences of early transition?
The charity origins

• Charities draw income from real estate

• Hospitals and guilds offer life-cycle risk cover

• Public corporations issue bonds and life annuities

• Instruments widely available, also to small investors (< 200 gld)

• Little connection to wider financial system
From early Modern to Modern

• New products: tontines (1650s), fire and life insurance companies (1700s), mutual funds (1770s)

  • Charity providers diversify from real estate into financial assets

  • Consumers obtain more choice

• Start of Merton’s virtual innovation spiral
From early Modern to Modern

- Fire and life companies earliest in Britain
- Influence relatively small until later 19th century
- Mutuals flourish in Amsterdam: the *negotiatie*
  - Securitization develops from 1690s
  - Stock substitution takes over from 1770s
  - Strong boost to market development
NEGOTIATIE
onder de Zelfprente
EENDRAGT MAAKT MAGT.
Opgezocht te AMSTERDAM.

CONDITIES.

Artikel I.

Deze Negotiatie is onder het auspicië van DE WEL EDZELE HEEREN
DIRK BAN BACKEUR,
en
FRANZ JACOB HEYAYS.
Als Commissarissen hier voor verantwoord en gesanctioneerd.

En van den Mohial ABRAHAM VAN NETJENS, als Administrateur.

En is behouden in derde Claflen, alle ondertoon met afgeleiden Gezondheids en Verantwoordelijke Claflen in Hoorn Aangeleeden, in der Aandeel genoot in Capital / 800 / 2.

Artikel II.

Het Capital van ieder Clafl van deze Negotiatie, bedraagt in de volgende Effectiën als:

1. Obligatien op de DEENSCHE en VEEGSE-BANEN.
2. ijs op de DEENSCHE TOLLEN, en HOLSTEYN.
3. ijs op RUNLAND, en ZWEDEN.
4. ijs op BRINNIVYK, en MEKLENBURG.
5. ijs op de SAXISCHE POSTERYN, en BAVARISCHE VOORLANDEN.
6. ijs op de SPAANSCH CANAAL en IMAAL en TAOSIE.
9. ijs op de DEERSCHE, ten Comptoon van de Heeren: J. A. EVANS, en L. SCHUSTER.
10. ijs op de DEENSCHE AMERIKAANSCHE PERSISTEN.

50. Obligatien, ieder groot Een duizend gulden, in ze aanzien in Capital 3 procent.

De ieder Clafl ten minste in 80 / 25 differenten munt, van bestaande Effectiën, die niet meer als 1 / 3der Obligatien van een en dezelfde Negotiatie, zijnde vorder in aller, zo veel mogelijk was, een gedeeltelijke bevorderlijk in weten genomen.

A

Artikel III.
ACTE VAN AANDEEL

VOOR VIER Honderd Dollars, in een Gemeenschapspelijk Bezit van een Capital van Vier Miljoenen Dollars Oriënteerde Amerikaansche Fondsen, onder bewaring en directie van

Hope & Co

de Heren R. en T. de SMITHE, te Amsterdam.

W. en J. WILLLINK,

Het voorgenoemden Capital van Vier Miljoenen Dollars Oriënteerde Amerikaansche Fondsen is een gedeelte van het Fonds van de Maatschappij en Twee Hollanders en Vrienden, gezien door de Verenigde Staten van Noord-Amerika, by Rechter of Acte van den 10 November 1865, en ter Thee van dit dito STAATEN reeds getransporteerd en verder te transporteerden op de gemeenschapspelck naam van Haren Bewarren en Directuren voorwoord.

Van het Capital van Vier Miljoenen Dollars zullen door de Verenigde Staten van Noord-Amerika worden betaald Interessen, tegen twee pro cent per jaar, betaalbaar in Amsterdam, of den Cour, en een half Gilders Holland-staats-goud per Dollar, en zal de Aflossing van het Capital zullen in Thee van dito STAATEN gedaan worden by jaarlijkse Termijnen van vierdaelige, en van elkene de Eerstel tot en met eenen Vierdaelige, Jaren, van den 1ste November 1865.

By jen Asse van Aandeel in deze gemeenschap zijn uitgegeven agieen Coopera van uitdeeling, tegen inkomst van dito van welke p 1ste, December 1865, en vervolgens tot 1ste December, als wet Intermisse van de Verenigde STAATEN voornoemd als dan by deze, door Haren Bewarren en Directuren zullen worden betaalde Vrij en Vrije Gelders Holland-staats-goud; ten ware de Aandeelen vijfde value worden, als in welke aanhefging by de Holland-staats-gouders de Coopera van volgende Jaren, tot de leden Aandeelen behorende, zullen zijn waar en van groot wensch.
The long afterlife of a bright idea

- By 1800 about estd 200 million guilders in *negotiaties*

- Stock substitution into guilder certificates standard for issuing foreign and later Dutch securities

- Issues managed by an *administratiekantoor* (trust office):
  - Splits dividend from voting rights
  - Bolsters shareholder power in US railroad reorganizations
  - Key defence technique against take-over threats from 1908
  - ‘Dutch discount’ unproven
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Carlos Slim admits defeat in €7.2bn takeover battle for KPN

Daniel Thomas and Anousha Sakoui in London and Jude Webber in Mexico City
OCTOBER 17, 2013

Carlos Slim, the Mexican tycoon who controls América Móvil, has admitted defeat in a gruelling €7.2bn takeover battle for KPN after the intervention of an independent foundation linked to the Dutch telecoms group.
Dutch government to float ABN Amro

State to recoup some of the €22bn it ploughed into bailed-out lender

ABN Amro will return to the private sector via an initial public offering, seven years after its €22bn bailout by Dutch taxpayers.

The Amsterdam-based bank confirmed that it intended to float by the end of this year, with analysts predicting that the lender could be worth more than €15bn—crystallising a large loss for the Dutch government.

Duncan Robinson in Brussels OCTOBER 27, 2015
PostNL shares sinking 6% as it rejects offer from Belgium’s bpost

Nathalie Thomas NOVEMBER 11, 2010

Dutch postal company PostNL has sunk to the bottom of the Stoxx 600 index in early trading on Friday after it rebuffed a takeover offer from Belgian rival bpost.

In a statement on Friday, PostNL said bpost’s offer – which was pitched at €2.825 in cash plus 0.1202 bpost share for each PostNL share – “does not represent a sufficiently compelling value proposition” for its shareholders. The offer currently values each PostNL share at €5.40.

The shares are sinking 6 per cent in early trading on Friday to €4.45, well below the offer value.
The long afterlife of a bright idea

• Simplification of the administratiekantoor, 1980s:

  • No longer a corporation, but a stichting (foundation)

  • Armed with the right to issue prefs, no longer loaded with the securities themselves

• Splitting dividend from voting rights finds new application: tax avoidance
The long afterlife of a bright idea

• Probably first stichting to safeguard ownership and avoid taxes IKEA, 1982

• 2002: no. of Stichting Administratiekantoor estimated at 12,500, gross income flow €3.6 tn, 8 times Dutch GDP

• The key institution at the heart of Tax Haven Netherlands

• Split of dividend and voting rights ties them back to 18th century mutuals
Conclusion

• Early rise of institutional investors Amsterdam consequence of precocious market development

• Securitization, stock substitution, and splitting rights standard techniques by 1770

• Successive transformations adapt them to ever more ingenious uses

• Sets financial system apart from others
The Rate of Return on Everything, 1870–2015

Òscar Jordà†  Katharina Knoll‡  Dmitry Kuvshinov§
Moritz Schularick¶  Alan M. Taylor★

†Federal Reserve Bank of San Francisco; University of California, Davis
‡Deutsche Bundesbank
§University of Bonn
¶University of Bonn; CEPR
★University of California, Davis; NBER; CEPR
Real estate is the largest asset class

Source: Savills Research
Households are betting the house

Housing is the most important household asset.

Source: ECB Household Portfolio Survey, Flow of Funds.
The great mortgaging

Housing loans are the main asset of the financial system.

Source: Jorda, Schularick, Taylor, JME 2015
Residential real estate

Housing is the asset that matters most, but it is the asset we know least about.
Residential real estate

Housing is the asset that matters most, but it is the asset we know least about.

A prominent example:

- The long-run equity risk premium is 6% (Mehra and Prescott 1985)
Residential real estate

Housing is the asset that matters most, but it is the asset we know least about.

A prominent example:

- The long-run equity risk premium is 6% (Mehra and Prescott 1985)
- What is the housing risk premium?
Residential real estate

Housing is the asset that matters most, but it is the asset we know least about.

A prominent example:

- The long-run equity risk premium is 6% (Mehra and Prescott 1985)
- What is the housing risk premium?
- How do housing returns vary over time and across space?
Our research

This paper presents:

1. Long-run returns on the main household asset: residential real estate.


3. Constructs economy-wide returns on wealth.
What we find

1. $r_{housing} \approx r_{equities}$ but $r_{housing}$ less volatile, less correlated internationally

2. $r_{safe}$ relatively volatile (ex post): today no lower than in other eras, 1980s high

3. $r_{wealth} \gg g$ across countries and over time . . .
NEW DATA ON GLOBAL RETURNS
Largest ever dataset on total returns in 16 economies over 145 years

|---------------|------------|------------|----------|---------|

Statement of the obvious: It took years, lots of work... ...but it gets <1 minute here today
What’s new?

- **New: Housing total returns, prices and rental yields**
  Before: scattered rents/returns for short periods, house prices from Knoll, Schularick, Steger (AER 2017)

- **New: Equity total returns, prices and dividend yields**
  Before: commercial providers, dividends and documentation scarce, new prices and dividends here

- **New: Govt. bond total returns and yields, bill yields**
  Before: yields existed, returns from commercial providers
What’s new?

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- **New:** Govt. bond total returns and yields, bill yields
  Before: yields existed, returns from commercial providers

- **Thanks to everyone who helped!**
  It will all be here as a public good:
JORDÀ-SCHULARICK-TAYLOR MACROHISTORY DATABASE

The Jordà-Schularick-Taylor Macrohistory Database is the result of an extensive data collection effort over several years. In one place it brings together macroeconomic data that previously had been dispersed across a variety of sources. On this website we provide convenient no-cost open access under a license to the most extensive long-run macro-financial dataset to date. Commercial data providers are strictly forbidden to integrate all or parts of the dataset into their services or sell the data (see Terms of Use and Licence Terms below).

The database covers 17 advanced economies since 1870 on an annual basis. It comprises 25 real and nominal variables. Among these, there are time series that had been hitherto unavailable to researchers, among them financial variables such as bank credit to the non-financial private sector, mortgage lending and long-term house prices. The database captures the near-universe of advanced-country macroeconomic and asset price dynamics, covering on average over 90 percent of advanced-economy output and over 50 percent of world output.

Assembling the database, we relied on the input from colleagues, coauthors and doctoral students in many countries, and consulted a broad range of historical sources and various publications of statistical offices and central banks. For some countries we extended existing data series, for others we relied on recent data collection efforts by others. Yet in a non-negligible number of cases we had to go back to archival sources including documents from governments, central banks, and private banks. Typically, we combined information from various sources and spliced series to create long-run datasets spanning the entire 1870–2014 period for the first time. The table below lists the available series.
LONG-RUN RETURNS
Return calculation

- Total real return: \[ r = \left( 1 + \left\{ \frac{\Delta P}{P + Y} \right\} \right) / (1 + \pi) - 1 \]

- Extensive sensitivity checks:
  Taxes, transaction costs, weighting, survivorship bias, rental yield benchmarks, stock market closures, leverage, location effects, compare to REITS, etc.
The rent-price approach

Rental yields ($RI$ is rent index, $HPI$ is house price index):

\[
\frac{RI_{t+1}}{HPI_{t+1}} = \left( \frac{RI_{t+1}/RI_t}{HPI_{t+1}/HPI_t} \right) \frac{RI_t}{HPI_t}
\]

Total returns:

\[
R_{h,t+1} = \frac{RI_{t+1}}{HPI_t} + \frac{HPI_{t+1} - HPI_t}{HPI_t}
\]

- Basic intuition: start with diversified net rent-price ratio (excludes maintenance, management, etc.)
- Iterate forward/backward using rent growth and constant-quality house prices
- Corroborate using balance sheet approach and historical rental yield data
Reconciling multiple sources

Example: USA

- Constructed rent-price ratio, final series
- Numbeo (city centers)
- Numbeo (rest of the country)
- Grebler et al (1956)
- Balance sheet approach
- Statistical abstract of the U.S.
- Census of housing
AGGREGATE TRENDS
Global returns
equal weights

Full sample

Post-1950

Excess Return vs Bills
Mean Annual Return
## Total returns since 1870

<table>
<thead>
<tr>
<th></th>
<th>Bills</th>
<th>Bonds</th>
<th>Equity</th>
<th>Housing</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Mean return p.a.</strong></td>
<td>0.98</td>
<td>2.50</td>
<td>6.89</td>
<td>7.05</td>
</tr>
<tr>
<td><strong>Std.dev.</strong></td>
<td>6.01</td>
<td>10.74</td>
<td>21.94</td>
<td>9.98</td>
</tr>
<tr>
<td><strong>Geometric mean</strong></td>
<td>0.78</td>
<td>1.94</td>
<td>4.64</td>
<td>6.61</td>
</tr>
<tr>
<td><strong>Mean excess return p.a.</strong></td>
<td>.</td>
<td>1.53</td>
<td>5.91</td>
<td>6.07</td>
</tr>
<tr>
<td><strong>Std.dev.</strong></td>
<td>.</td>
<td>8.38</td>
<td>21.43</td>
<td>9.86</td>
</tr>
<tr>
<td><strong>Geometric mean</strong></td>
<td>.</td>
<td>1.19</td>
<td>3.81</td>
<td>5.64</td>
</tr>
<tr>
<td><strong>Observations</strong></td>
<td>1739</td>
<td>1739</td>
<td>1739</td>
<td>1739</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
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<th>Bonds</th>
<th>Equity</th>
<th>Housing</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Mean return p.a.</strong></td>
<td>0.87</td>
<td>2.77</td>
<td>8.28</td>
<td>7.44</td>
</tr>
<tr>
<td><strong>Std.dev.</strong></td>
<td>3.43</td>
<td>9.94</td>
<td>24.20</td>
<td>8.88</td>
</tr>
<tr>
<td><strong>Geometric mean</strong></td>
<td>0.81</td>
<td>2.30</td>
<td>5.54</td>
<td>7.10</td>
</tr>
<tr>
<td><strong>Mean excess return p.a.</strong></td>
<td>.</td>
<td>1.91</td>
<td>7.41</td>
<td>6.57</td>
</tr>
<tr>
<td><strong>Std.dev.</strong></td>
<td>.</td>
<td>9.20</td>
<td>23.77</td>
<td>9.19</td>
</tr>
<tr>
<td><strong>Geometric mean</strong></td>
<td>.</td>
<td>1.51</td>
<td>4.79</td>
<td>6.21</td>
</tr>
<tr>
<td><strong>Observations</strong></td>
<td>1016</td>
<td>1016</td>
<td>1016</td>
<td>1016</td>
</tr>
</tbody>
</table>

**Note:** Annual global returns in 16 countries, equally weighted. Period coverage differs across countries. Consistent coverage within countries. Excess returns are computed relative to bills.
More checks

- Compare to REITS
- Taxation
- Effect of leverage
La Fourmi immobilière

TABLEAU 1  Les acquisitions d'immeubles parisiens par La Fourmi Immobilière de 1899 à 1913

<table>
<thead>
<tr>
<th>ADRESSE</th>
<th>Date Achat</th>
<th>Année Construction</th>
<th>Surface en m²</th>
<th>Prix Achat en 1000 F courants</th>
<th>Prix Achat en 1000 F 1995</th>
<th>Valeur 1995 en millions de F</th>
<th>Revenu brut annuel (1) %</th>
</tr>
</thead>
<tbody>
<tr>
<td>11, chaussée d'Antin - 16e</td>
<td>1899</td>
<td>1897</td>
<td>2.391</td>
<td>1.194,9</td>
<td>22.807,9</td>
<td>64,0</td>
<td>6,0</td>
</tr>
<tr>
<td>16, rue de Lubeck - 16e</td>
<td>1901</td>
<td>1890</td>
<td>1.170</td>
<td>555,0</td>
<td>10.593,8</td>
<td>34,0</td>
<td>6,3</td>
</tr>
<tr>
<td>34, rue Pierre-Sémard - 9e</td>
<td>1902</td>
<td>1900</td>
<td>1.111</td>
<td>332,7</td>
<td>6.351,3</td>
<td>22,0</td>
<td>6,5</td>
</tr>
<tr>
<td>80, rue du Rocher - 8e</td>
<td>1903</td>
<td>1900</td>
<td>1.995</td>
<td>780,0</td>
<td>14.888,6</td>
<td>40,0</td>
<td>6,5</td>
</tr>
<tr>
<td>5, rue du 4-Septembre - 2e</td>
<td>1904</td>
<td>1870</td>
<td>2.167</td>
<td>750,0</td>
<td>14.316,0</td>
<td>31,0</td>
<td>6,5</td>
</tr>
<tr>
<td>4, rue Léon-Cosnard - 17e</td>
<td>1905</td>
<td>1903</td>
<td>1.257</td>
<td>408,0</td>
<td>7.787,9</td>
<td>27,5</td>
<td>7,0</td>
</tr>
<tr>
<td>17, rue de Longchamp - 16e</td>
<td>1906</td>
<td>1900</td>
<td>1.543</td>
<td>382,5</td>
<td>7.909,7</td>
<td>36,0</td>
<td>6,6</td>
</tr>
<tr>
<td>25, rue du Colonel Moll - 17e</td>
<td>1906</td>
<td>1900</td>
<td>1.017</td>
<td>595,0</td>
<td>12.304,0</td>
<td>27,0</td>
<td>7,0</td>
</tr>
<tr>
<td>32, boulevard Poissonnière - 9e</td>
<td>1907</td>
<td>1900</td>
<td>1.138</td>
<td>1.045,0</td>
<td>19.947,0</td>
<td>19,0</td>
<td>6,0 (net)</td>
</tr>
<tr>
<td>63bis, rue Danrémont - 18e</td>
<td>1908</td>
<td>1906</td>
<td>1.584</td>
<td>420,0</td>
<td>8.017,0</td>
<td>30,0</td>
<td>7,8</td>
</tr>
<tr>
<td>21, rue Poncelet - 17e</td>
<td>1909</td>
<td>1900</td>
<td>1.603</td>
<td>330,0</td>
<td>6.299,0</td>
<td>31,0</td>
<td>7,1</td>
</tr>
<tr>
<td>40, rue des Abbesses - 18e</td>
<td>1909</td>
<td>1907</td>
<td>1.966</td>
<td>560,0</td>
<td>10.689,3</td>
<td>34,0</td>
<td>7,1</td>
</tr>
<tr>
<td>121, rue de Courcelles - 17e</td>
<td>1910</td>
<td>1900</td>
<td>1.156</td>
<td>500,0</td>
<td>9.544,0</td>
<td>27,0</td>
<td>7,4</td>
</tr>
<tr>
<td>7, rue Saint-Senoch - 17e</td>
<td>1911</td>
<td>1904</td>
<td>1.934</td>
<td>737,0</td>
<td>12.192,2</td>
<td>43,0</td>
<td>7,1</td>
</tr>
<tr>
<td>16, rue Pérignon - 7e</td>
<td>1913</td>
<td>1900</td>
<td>1.902</td>
<td>598,0</td>
<td>9.892,7</td>
<td>46,0</td>
<td>7,4</td>
</tr>
<tr>
<td>TOTAL</td>
<td></td>
<td></td>
<td>23.934</td>
<td>9.570,6</td>
<td>173.540,4</td>
<td>511,5</td>
<td></td>
</tr>
</tbody>
</table>

(1) Revenu brut annuel au moment de l'acquisition (qui est souvent précisé dans le Rapport annuel de l'année suivante, qui décrit l'opération d'achat.)
Comparing French housing return with La Fourmi

<table>
<thead>
<tr>
<th></th>
<th>Fourmi immobiliere</th>
<th>French Housing</th>
<th>French Equities</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean return p.a.</td>
<td>16.93</td>
<td>15.69</td>
<td>8.79</td>
</tr>
<tr>
<td>Std.dev.</td>
<td>31.35</td>
<td>10.37</td>
<td>24.54</td>
</tr>
<tr>
<td>Observations</td>
<td>87</td>
<td>87</td>
<td>87</td>
</tr>
</tbody>
</table>

*Note:* Arithmetic average annual returns. Consistent sample coverage.
Housing returns compared to REITS

USA

- US REITs, unlevered: 5-year moving average
- US Housing: 5-year moving average

France

- La Fourmi immobiliere: decadal moving average
- French Housing: decadal moving average
All our returns are pre-tax (too much variation in property and capital income taxation to track)

But: corporate profits are post-tax.

Does it make a difference?

Clearly not for households as investors, but fundamentally.
History of corporate taxation

Figure: Effective corporate tax rate, average of 5 countries

Note: Average effective tax rate in Australia, France, Germany, Japan and US, equally weighted. Japanese tax rate interpolated between 1900 and 1930. Effective tax rate is total taxes paid / net corporate profits. Where effective data are not available, we extrapolate the series using statutory (top marginal) tax rates.
Leverage

- Our housing returns are returns on asset.
- Stock returns are returns on equity.
- Solution: relever housing or deleverage equity returns.
Leverage of US corporates, 1920-today

Source: Graham/Leary/Roberts (2014)
## Returns: deleveraged and tax adjusted

<table>
<thead>
<tr>
<th></th>
<th>Baseline</th>
<th>Deleveraged</th>
<th>Adjusting dividends</th>
<th>Adjusting profits</th>
</tr>
</thead>
<tbody>
<tr>
<td>Australia</td>
<td>7.88</td>
<td>6.57</td>
<td>6.85</td>
<td>7.47</td>
</tr>
<tr>
<td>France</td>
<td>3.97</td>
<td>3.12</td>
<td>3.27</td>
<td>3.46</td>
</tr>
<tr>
<td>Germany</td>
<td>6.85</td>
<td>5.85</td>
<td>5.94</td>
<td>5.97</td>
</tr>
<tr>
<td>Japan</td>
<td>6.09</td>
<td>4.85</td>
<td>5.22</td>
<td>6.72</td>
</tr>
<tr>
<td>United States</td>
<td>8.46</td>
<td>7.11</td>
<td>7.47</td>
<td>8.70</td>
</tr>
</tbody>
</table>

*Note:* Arithmetic average of deleveraged annual equity returns. Returns are deleveraged using data on debt/capital of U.S. firms. Period coverage differs across countries. Consistent coverage within countries.
Returns across countries
And the winner is:

<table>
<thead>
<tr>
<th>Country</th>
<th>Bills</th>
<th>Bonds</th>
<th>Equity</th>
<th>Housing</th>
</tr>
</thead>
<tbody>
<tr>
<td>Austrailia</td>
<td>1.29</td>
<td>2.26</td>
<td>7.75</td>
<td>6.54</td>
</tr>
<tr>
<td>Belgium</td>
<td>0.70</td>
<td>2.87</td>
<td>6.78</td>
<td>8.64</td>
</tr>
<tr>
<td>Denmark</td>
<td>2.64</td>
<td>3.24</td>
<td>7.20</td>
<td>8.17</td>
</tr>
<tr>
<td>Finland</td>
<td>0.08</td>
<td>4.25</td>
<td>9.98</td>
<td>9.58</td>
</tr>
<tr>
<td>France</td>
<td>-0.48</td>
<td>1.44</td>
<td>4.06</td>
<td>7.34</td>
</tr>
<tr>
<td>Germany</td>
<td>2.65</td>
<td>4.03</td>
<td>6.85</td>
<td>7.82</td>
</tr>
<tr>
<td>Italy</td>
<td>1.37</td>
<td>3.19</td>
<td>7.32</td>
<td>4.77</td>
</tr>
<tr>
<td>Japan</td>
<td>0.39</td>
<td>2.18</td>
<td>6.09</td>
<td>6.54</td>
</tr>
<tr>
<td>Netherlands</td>
<td>0.78</td>
<td>1.85</td>
<td>7.09</td>
<td>7.28</td>
</tr>
<tr>
<td>Norway</td>
<td>0.90</td>
<td>2.29</td>
<td>5.95</td>
<td>8.03</td>
</tr>
<tr>
<td>Portugal</td>
<td>-0.48</td>
<td>1.37</td>
<td>4.37</td>
<td>6.31</td>
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<tr>
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<td>-0.03</td>
<td>1.39</td>
<td>5.93</td>
<td>5.09</td>
</tr>
<tr>
<td>Sweden</td>
<td>1.56</td>
<td>3.14</td>
<td>7.98</td>
<td>8.30</td>
</tr>
<tr>
<td>Switzerland</td>
<td>0.81</td>
<td>2.33</td>
<td>6.90</td>
<td>5.77</td>
</tr>
<tr>
<td>UK</td>
<td>1.15</td>
<td>1.96</td>
<td>7.20</td>
<td>5.36</td>
</tr>
<tr>
<td>USA</td>
<td>1.45</td>
<td>2.26</td>
<td>8.39</td>
<td>6.03</td>
</tr>
</tbody>
</table>

Average, unweighted: 1.15 2.62 6.65 7.32
Average, weighted: 1.26 2.49 7.11 6.75
And the winner is: Finland

<table>
<thead>
<tr>
<th></th>
<th>Bills</th>
<th>Bonds</th>
<th>Equity</th>
<th>Housing</th>
</tr>
</thead>
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<td>Australia</td>
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<td>7.75</td>
<td>6.54</td>
</tr>
<tr>
<td>Belgium</td>
<td>0.70</td>
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<td>8.17</td>
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</tr>
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<tr>
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<tr>
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<td><strong>8.39</strong></td>
<td><strong>6.03</strong></td>
</tr>
<tr>
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<td><strong>6.65</strong></td>
<td><strong>7.32</strong></td>
</tr>
<tr>
<td>Average, weighted</td>
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<td><strong>2.49</strong></td>
<td><strong>7.11</strong></td>
<td><strong>6.75</strong></td>
</tr>
</tbody>
</table>
## Decomposition of returns

<table>
<thead>
<tr>
<th></th>
<th>Housing</th>
<th>Equity</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>All countries</td>
<td>U.S.</td>
</tr>
<tr>
<td>Yield</td>
<td>5.5</td>
<td>5.3</td>
</tr>
<tr>
<td>Real capital gain</td>
<td>1.5</td>
<td>0.7</td>
</tr>
<tr>
<td>Total return</td>
<td>7.0</td>
<td>6.0</td>
</tr>
</tbody>
</table>

Note: annual returns, pooled over countries.
Returns on equities versus housing
Risk and return of equities and housing
Returns on equities versus housing

Correlations

\[
\text{Corr}_{i,t} = \frac{\sum_j \sum_{k \neq j} \text{Corr}(r_{i,j,t \in T}, r_{i,k,t \in T})}{\sum_j \sum_{k \neq j} 1}
\]

for asset \(i\), \(T = (t - 5, t + 5)\); \(j\) and \(k\) denote the country pairs
Returns on bills versus bonds

Real bill rate: decadal moving average
Real bond return: decadal moving average
Returns on total wealth and growth

\( r > g \)
Main takeways

1. Long-run housing returns similar to equity returns
2. Safe returns more variable than risky returns
3. $r \gg g$ across time and countries
4. Cross-country equity returns increasingly correlated, but not housing
The Big Bang:
Stock Market Capitalization in the Long Run

Dmitry Kuvshinov and Kaspar Zimmermann
University of Bonn

Institutional Investors Conference, London

October 2018
Motivation

- Market capitalization matters for ...
  - ... aggregate wealth dynamics
  - ... inequality of wealth and income
  - ... economic activity

- Economists use market capitalization to measure ...
  - ... financial development
  - ... market valuations (Tobin’s Q, Buffet Indicator)
What we do

1. Introduce a new annual dataset on stock market capitalization for 17 countries over the last 150 years

2. Document the evolution of stock market size in advanced economies

3. Study the underlying drivers behind short, medium and long-term fluctuations
What we know so far

- Rajan and Zingales (2003): Great Reversal Hypothesis
  - Financial markets were large in 1913, small in 1980 and are again large today
  - Rationalized with political economy model

- Recent increase in real value of listed US firms
  - Lower corporate taxes (McGrattan and Prescott, 2005)
  - Higher market power (De Loecker and Eeckhout, 2017)
  - Low risk premia (Lettau et al., 2008)
What we find

1. Stock market size was stable until the 1980s, but skyrocketed thereafter ⇒ the big bang

2. Fluctuations in market cap are largely driven by valuations, not issuances

3. Low risk premia are key in explaining the big bang

4. Market cap is a predictor of booms and busts in equity markets
Facts
Data

1. First annual long-run cross-country dataset on stock market capitalization

2. Major data challenges
   - Domestic vs foreign shares
   - Stocks vs bonds
   - One vs many exchanges

3. Coverage
   - 17 countries: Australia, Belgium, Canada, Denmark, Finland, France, Germany, Italy, Japan, the Netherlands, Norway, Portugal, Spain, Sweden, Switzerland, the United Kingdom and the United States
   - 1870-2015
The big bang
Stock market capitalization in 17 advanced economies

- Size of the stock market stable between 1870 and 1985
- Historically unprecedented expansion over recent decades
Stock market capitalization in individual countries
World market capitalization shares

- Roughly equal shares of the UK, France and the USA at the beginning of our sample
- Dominance of the USA until recent decades
Understanding the big bang
Decomposition of stock market growth

Market capitalization in the economy:

\[ MCAP_t = \sum_{i=1}^{N} P_{i,t} Q_{i,t} \]

Changes in market capitalization:

\[ MCAP_t = MCAP_{t-1} + \text{Issuances}_t + \text{CapGain}_t \]

Growth decomposition:

\[ g_t^{MCAP/GDP} \approx \text{iss}_t + r_{eq}^t - g_t \]
Decomposition trends and counterfactuals

![Graph showing market cap to GDP growth, capital gains, net issuance, and actual data for market cap to GDP ratio.]
Market capitalization growth decomposition

- Issuances stable over the medium and long run
- Big bang driven by higher capital gains

<table>
<thead>
<tr>
<th></th>
<th>(1)</th>
<th>(2)</th>
<th>(3)</th>
<th>(4)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Full sample</td>
<td>Pre 1914</td>
<td>1914–1985</td>
<td>Post 1985</td>
</tr>
<tr>
<td>Market capitalization growth</td>
<td>1.55</td>
<td>2.44</td>
<td>-0.12</td>
<td>4.49</td>
</tr>
<tr>
<td>Decomposition of market capitalization growth into:</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Implied issuance to market cap</td>
<td>3.86</td>
<td>3.74</td>
<td>4.08</td>
<td>3.49</td>
</tr>
<tr>
<td>+ Real capital gain on equity</td>
<td>0.41</td>
<td>0.96</td>
<td>-1.15</td>
<td>3.41</td>
</tr>
<tr>
<td>– Real GDP growth</td>
<td>2.82</td>
<td>2.41</td>
<td>3.23</td>
<td>2.27</td>
</tr>
<tr>
<td>+ Approximation residual</td>
<td>0.10</td>
<td>0.15</td>
<td>0.19</td>
<td>-0.14</td>
</tr>
<tr>
<td>Observations</td>
<td>2076</td>
<td>448</td>
<td>1124</td>
<td>504</td>
</tr>
</tbody>
</table>
Cross-country evidence

(a) Market cap growth and equity issuance

(b) Market cap growth and capital gains
Drivers of the shift in stock valuations

We further decompose stock market valuations:

\[ \text{MCAP}_t = \sum_{i=1}^{N} P_{i,t} Q_{i,t} = \sum_{i=1}^{N} Q_{i,t} \sum_{j=1}^{\infty} \frac{\text{CF}_{i,t+j}(1 - \tau_{t+j})}{(1 + r_t)^j} \]

Potential candidates:

- Higher expected cashflows \( \text{CF}_{i,t+j} \)
- Lower taxes \( \tau_{t+j} \)
- Lower discount rates \( r_t \)
Gross equity cashflows throughout history

- Dividends to GDP rose by a factor of 2.5 between 1985 and 2015
- However, no corresponding increase in aggregate profitability
Taxation and the big bang

- Tax cuts roughly coincided with the big bang
- Stock market capitalization was low in the early sample period, even though taxes were close to zero
- Taxes and market cap are uncorrelated in simple explanatory regressions
Discount rates and the big bang

- Discount rates fell sharply around the big bang
- Driven by risk premia, not safe rate
Taking stock of the underlying drivers

- Issuance stable over the long run
- No correlation with corporate tax rates
- Both risk premia and cashflows seem to matter

Next: What drives the cyclical variation in market capitalization?
Stock market capitalization and equity market risk
The Buffet Indicator

“the best single measure of where valuations stand at any given moment” (Buffett and Loomis, 2001)

Market Capitalization combines information on

- Prices (Campbell and Shiller, 1988)
- Quantities (Baker and Wurgler, 2000; Nelson, 1999)

What we do:

1. Predicting equity returns with stock market capitalization
2. Equity bubbles and crashes (tail risk)
Predicting equity returns with market capitalization

- High market cap predicts negative returns
- High market cap does not predict positive dividend growth

\[
\begin{align*}
    r_{t+1} &= \beta_0 + \beta_1 \frac{MCAP_t}{GDP_t} + \beta_2 \frac{D_t}{P_t} + u_t \\
    dg_{t+1} &= \gamma_0 + \gamma_1 \frac{MCAP_t}{GDP_t} + \gamma_2 \frac{D_t}{P_t} + e_t
\end{align*}
\]

Panel 1: One-year ahead returns and dividend growth

<table>
<thead>
<tr>
<th></th>
<th>Real returns</th>
<th>Excess returns</th>
<th>Real dividend growth</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>(1)</td>
<td>(2)</td>
<td>(3)</td>
</tr>
<tr>
<td>\log(\frac{MCAP_t}{GDP_t})</td>
<td>-0.037***</td>
<td>-0.029**</td>
<td>-0.032***</td>
</tr>
<tr>
<td></td>
<td>(0.007)</td>
<td>(0.010)</td>
<td>(0.005)</td>
</tr>
<tr>
<td>\log(\frac{D_t}{P_t})</td>
<td>0.030</td>
<td>0.018</td>
<td>-0.161***</td>
</tr>
<tr>
<td></td>
<td>(0.017)</td>
<td>(0.017)</td>
<td>(0.035)</td>
</tr>
<tr>
<td>(R^2)</td>
<td>0.015</td>
<td>0.019</td>
<td>0.011</td>
</tr>
</tbody>
</table>

Also works over 5 & 10 years, works better post 1985
Predicting equity returns with net issuances

Why does market capitalization do so well as an equity return predictor?

It contains information on quantities as well as prices

<table>
<thead>
<tr>
<th>Panel 1: One-year ahead returns and dividend growth</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Real returns</strong></td>
</tr>
<tr>
<td><strong>Excess returns</strong></td>
</tr>
<tr>
<td><strong>Real dividend growth</strong></td>
</tr>
<tr>
<td>(1) (2) (3) (4) (5) (6)</td>
</tr>
<tr>
<td>Issuance / GDP</td>
</tr>
<tr>
<td>-0.860*** (0.398)</td>
</tr>
<tr>
<td>-0.786* (0.384)</td>
</tr>
<tr>
<td>-0.616*** (0.288)</td>
</tr>
<tr>
<td>-0.545* (0.286)</td>
</tr>
<tr>
<td>-0.215 (0.337)</td>
</tr>
<tr>
<td>-0.413 (0.381)</td>
</tr>
<tr>
<td>log(D_t / P_t)</td>
</tr>
<tr>
<td>0.046*** (0.010)</td>
</tr>
<tr>
<td>0.043*** (0.012)</td>
</tr>
<tr>
<td>-0.121*** (0.029)</td>
</tr>
<tr>
<td>R^2</td>
</tr>
<tr>
<td>0.011</td>
</tr>
<tr>
<td>0.021</td>
</tr>
<tr>
<td>0.006</td>
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<tr>
<td>0.015</td>
</tr>
<tr>
<td>0.000</td>
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<tr>
<td>0.048</td>
</tr>
<tr>
<td>Observations</td>
</tr>
<tr>
<td>1907</td>
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<tr>
<td>1907</td>
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<tr>
<td>1907</td>
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<tr>
<td>1907</td>
</tr>
<tr>
<td>1907</td>
</tr>
<tr>
<td>1907</td>
</tr>
</tbody>
</table>
Market capitalization run-ups look a lot like equity bubbles

- Run-ups in market cap are followed by low valuations, low returns and high tail risk
- High or rising market cap predicts rising equity market crash risk

Run-up: 35% of GDP or higher increase in market cap over 2 years, and 17.5% of GDP or higher increase over 5 years
Conclusion

- The Big Bang: Structural increase of stock market capitalization in the 1980s and 1990s

- We analyse the drivers of structural and cyclical variation in market capitalization
  - Fluctuations largely driven by valuations
  - Limited role for issuances and taxes
  - Evidence for Buffet Indicator: Market cap predicts negative returns and market crashes
Stock returns around run-ups in alternative valuation measures
## Predicting Equity Market Crashes: alternative specifications

<table>
<thead>
<tr>
<th></th>
<th>(1) Pre 1945</th>
<th>(2) Post 1945</th>
<th>(3) Post 1985</th>
<th>(4) War Obs.</th>
<th>(5) Credit Growth</th>
</tr>
</thead>
<tbody>
<tr>
<td>( \log(\text{MCAP}<em>{t-1}/\text{GDP}</em>{t-1}) )</td>
<td>3.04***</td>
<td>0.69***</td>
<td>1.55***</td>
<td>0.74***</td>
<td>0.79***</td>
</tr>
<tr>
<td></td>
<td>(0.86)</td>
<td>(0.14)</td>
<td>(0.35)</td>
<td>(0.12)</td>
<td>(0.11)</td>
</tr>
<tr>
<td>( \Delta_3 \log(\text{MCAP}<em>{t-1}/\text{GDP}</em>{t-1}) )</td>
<td>1.42**</td>
<td>0.50**</td>
<td>1.25***</td>
<td>0.69***</td>
<td>0.63***</td>
</tr>
<tr>
<td></td>
<td>(0.60)</td>
<td>(0.24)</td>
<td>(0.32)</td>
<td>(0.26)</td>
<td>(0.24)</td>
</tr>
</tbody>
</table>

|                      | ✓            | ✓            | ✓            | ✓            | ✓                |
| Country fixed effects | ✓            | ✓            | ✓            | ✓            | ✓                |
| ROC                  | 0.80         | 0.70         | 0.79         | 0.70         | 0.75             |
| Number of Crashes    | 27           | 98           | 53           | 145          | 119              |
| Observations         | 583          | 1161         | 527          | 2043         | 1888             |

<table>
<thead>
<tr>
<th></th>
<th>(1) Decade</th>
<th>(2) Large Crashes</th>
<th>(3) 1-year Crashes</th>
<th>(4) 3-year Crashes</th>
<th>(5) MCAP Crashes</th>
</tr>
</thead>
<tbody>
<tr>
<td>( \log(\text{MCAP}<em>{t-1}/\text{GDP}</em>{t-1}) )</td>
<td>0.65***</td>
<td>1.05***</td>
<td>0.75***</td>
<td>0.92***</td>
<td>0.55***</td>
</tr>
<tr>
<td></td>
<td>(0.24)</td>
<td>(0.22)</td>
<td>(0.14)</td>
<td>(0.12)</td>
<td>(0.11)</td>
</tr>
<tr>
<td>( \Delta_3 \log(\text{MCAP}<em>{t-1}/\text{GDP}</em>{t-1}) )</td>
<td>0.87***</td>
<td>1.36**</td>
<td>0.01</td>
<td>1.27***</td>
<td>0.98***</td>
</tr>
<tr>
<td></td>
<td>(0.29)</td>
<td>(0.59)</td>
<td>(0.21)</td>
<td>(0.40)</td>
<td>(0.29)</td>
</tr>
</tbody>
</table>

|                      | ✓            | ✓            | ✓            | ✓            | ✓                |
| Country fixed effects | ✓            | ✓            | ✓            | ✓            | ✓                |
| ROC                  | 0.78         | 0.80         | 0.69         | 0.76         | 0.70             |
| Number of Crashes    | 125          | 30           | 94           | 106          | 147              |
| Observations         | 2003         | 1730         | 1857         | 1857         | 1857             |
Making Capital Efficient
Non-life insurance as institutional investor, underlying mechanisms and the experience of
the Zurich Insurance Company 1872-1950

eabh Conference: The Rise of Institutional Investors, London October 26, 2018

Christofer Stadlin, Corporate Archives, Zurich Insurance Group
The second industrial revolution and its risks
Perception changes: Destiny turns into responsibility & liability
Responsibility and the Bourgeois Middle Classes

- First accident insurer: Railway Passengers Assurance Co. UK 1849
  - Personal responsibility to take precautions against material consequences of accidents
  - Railway-Travel, Travel & Personal Accident Insurance

Liability and the Social Question

- German Imperial Liability Law (Reichshaftpflichtgesetz) 1871 makes industrialists liable for material consequences towards their workforce and third parties
  - Liability becomes a financial risk
  - Liability insurance, collective accident insurance – workmen’s compensation
Insure and set capital free
Risk transfer, risk pooling

- Insurance stock companies allow total risk transfer for fixed premiums
  - Risk becomes budgetable
  - Keeping of excess capital to cover risks not necessary
  - Lower excess capital more free capital

- Risk pooling
  - Premiums adjusted to the effective administrative and claim costs
  - The larger the risk group(s)
  - The broader the spread of administrative and claims costs (solidarity)
  - The lower the premiums

Premium-receipt 1903

Policy for
Lifelong
Railway &
Steamship
Accident
Insurance
1912

Policy for Personal
Accident Insurance
1881
Insure and set **capital free**

**Safety**

- Incentives to take safety measures
  - Loss prevention
  - Fewer claims
    - Insurer => higher profits
    - Insured => **lower premiums** & less suffering

- Corrective mechanism of fixed premium system:
  - Policies can be cancelled after each claim / loss event
  - Premiums adapted to loss experience at individual policy level
    - High claim costs => higher premiums
    - Low claim costs => **lower premiums**
Capitalise risks and claims & collect the capital
Funded scheme reserving

- Funded scheme approach: insured risks fully capitalised, claims at best guess
- **Premium reserves** (for unexpired risks):
  - Premiums paid before or at inception of a policy
  - Example: Workers Accident Insurance Policy CHF 12’000 Premium / 12 Months

- **Claims reserves** for not yet regulated/paid claims at best guess and experience
Non-Life insurance as Institutional Investor

- All capital booked for the reserves on the liability side of the balance sheet to be invested on capital markets
- Invested assets represent liabilities towards customers and third parties

Allegorical figure group representing accident insurance with the horn of plenty providing material relieve (in the artists workshop)

Figure group on top of Zurich’s headquarters
Zurich as Institutional Investor 1873-1950

Sources: Annual Reports & Internal Inventories

Annual Report 1887

Annual Report 1940

Annual Report 1941

Internal Inventory 1945
Zurich as Institutional Investor 1873-1950
Foundation, Uses of a Stock Company, Early Investments

Investment Classes, Share Capital & GWP 1873 (Foundation) - 1895

- Other Bonds
- US American Bonds
- Mortages
- German Bonds
- British Bonds
- GWP
- Share capital
Zurich as Institutional Investor 1873-1950
Investment Know-How & Governance

Heinrich E. Streuli
(* 1839 † 1915)
Board member 1872 – 1915
Vice-Chairman 1883 – 1887, 1899 – 1901
Chairman 1902 - 1915

Carl Abegg-Arter
(* 1836 † 1912)
Board member 1872 – 1912
Vice-Chairman 1880 – 1883, 1901- 1912

Credit Suisse
Board member 1868-1912
Chairman 1883-1911
Zurich as Institutional Investor 1873-1950
The Big Picture

Investment Classes, Share Capital & GWP 1896 - 1950
Investment Types / Classes

1895 INVESTMENT TYPES

- Mortgages 44%
- Railway Bonds 26%
- Public Bonds 16%
- Private Bonds 14%
Mortgages
### Risk of Railway Bonds

Bad experience with Gotthardbahn early on

**Annual Report 1875**

#### Activa.

Ad 3. Der «Effektenbestand» umfasst folgende Werthe:

<table>
<thead>
<tr>
<th>Fr. 100,000. — 5 % Gotthardbahn-Obligationen à 97 3/8</th>
<th>Fr. 97,375. —</th>
</tr>
</thead>
<tbody>
<tr>
<td>$ 20,000. — Equitable Trust Company Bonds,</td>
<td></td>
</tr>
<tr>
<td>bestehend aus:</td>
<td></td>
</tr>
<tr>
<td>$ 5,000 Elmes dafür haften in 1. Hypothek. $ 10,800</td>
<td></td>
</tr>
<tr>
<td>$ 5,000 Pitts</td>
<td>$ 10,700</td>
</tr>
<tr>
<td>$ 5,000 Howard</td>
<td>$ 10,800</td>
</tr>
<tr>
<td>$ 5,000 Hamlin</td>
<td>$ 10,000</td>
</tr>
<tr>
<td></td>
<td>$ 42,300</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>$ 20,000 pari à Fr. 4. 50</th>
<th>Fr. 90,000. —</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Fr. 187,375. —</td>
</tr>
</tbody>
</table>

Reducution der Gotthardbahn-Obligationen auf den Kurs von 55 %.

Abschreibung                                      Fr. 42,375. —

Fr. 145,000. —
Railway Bonds

1895 RAILWAY BONDS BY COUNTRY

- CH 32%
- Austria-Hungary 28%
- US 20%
- Russia 6%
- Belgium 2%
- Italy 4%
- France 8%
Railway Bonds 1910-1940
Securities portfolio 1910-1940
## Public Bonds & Public-Private Utilities

"Mündelsicher" (State guaranteed gilt-edged securities)

### Annual Report 1908

<table>
<thead>
<tr>
<th>Ausländische Effekten:</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Deutsch. Reichsanleihe</td>
<td>90</td>
</tr>
<tr>
<td>Deutsche Reichsanleihe</td>
<td>80</td>
</tr>
<tr>
<td>Preussische Schatzanweisungen von 1907</td>
<td>95</td>
</tr>
<tr>
<td>Preussische Consols von 1908</td>
<td>95</td>
</tr>
<tr>
<td>Preussische Consols</td>
<td>90</td>
</tr>
<tr>
<td>Württembergische Staats-Anleihe von 1907</td>
<td>95</td>
</tr>
<tr>
<td>Württembergische Staats-Anleihen von 1881, 1885, 1900</td>
<td>90</td>
</tr>
<tr>
<td>Badische Eisenbahn-Anleihen von 1894 und 1900</td>
<td>90</td>
</tr>
<tr>
<td>Bayerisches Eisenbahn-Anleihen von 1896</td>
<td>90</td>
</tr>
<tr>
<td>Hessische Staats-Anleihe von 1896</td>
<td>80</td>
</tr>
<tr>
<td>Hamburgische Staats-Anleihe von 1902</td>
<td>80</td>
</tr>
<tr>
<td>Rheinprovinz-Anleihe von 1908</td>
<td>95</td>
</tr>
<tr>
<td>Brandenburgische Provinzial-Anleihe von 1899</td>
<td>87 1/2</td>
</tr>
<tr>
<td>Stadtanleihe Berlin von 1908</td>
<td>95</td>
</tr>
<tr>
<td>Stadtanleihe Frankfurt a. M. von 1896</td>
<td>90</td>
</tr>
<tr>
<td>Stadtanleihe Köln a. Rh. von 1908</td>
<td>95</td>
</tr>
<tr>
<td>Stadtanleihe Mühlhausen i. E. von 1908</td>
<td>95</td>
</tr>
<tr>
<td>Stadtanleihe Stuttgart von 1907</td>
<td>95</td>
</tr>
<tr>
<td>Oblig. der Deutsch-Überseischen Elektrizitäts-Gesellschaft, Berlin, von 1907</td>
<td>pari</td>
</tr>
<tr>
<td>Oblig. der Allgem. Elektrizitäts-Ges., Berlin, v. 1908</td>
<td>97 1/4</td>
</tr>
<tr>
<td>Oblig. der Berliner Elektrizitätswerke von 1901</td>
<td>97 1/2</td>
</tr>
<tr>
<td>Oblig. des Elektrizitätswerkes Strassburg von 1901</td>
<td>97 1/2</td>
</tr>
<tr>
<td>Oblig. der Kraftübertragungswerke Rheinfelden, Badisch-Rheinfelden, von 1908</td>
<td>pari</td>
</tr>
</tbody>
</table>
Public/Government Bonds (securities portfolio) 1910-40

Internal Inventory 1942
US Government CHF 40’412’632

Internal Inventory 1945
US Government CHF 104’552’687
Investments by Countries: Safe havens 1895-1945

- 1895 CH 53%
- 1915 CH 67%
- 1935 CH 62%
- 1945 CH 40% US 51%
Thank you
Appendix
Investments as indicators for economic history
Austra-Hungarian Empire an economic powerhouse at the close of 19th century
Investment and GWP
Experience of Germany and US
Investment profits

Return on Investment 1873-1950

- Investments
- Profits on Investments
- Return in %
### Annual Report 1930

**Amerikanische:**
- Vereinigte Staaten von Amerika: 6,355,251.20
- Eisenbahnen: 33,940,472.50
- Elektrizitäts-Unternehmungen ("Public Utilities"): 18,290,264.75
- Industrie-Unternehmungen: 2,519,656.25

**Canadische:**
- Dominion, Provinzen, Städte, Eisenbahnen: 2,856,250.00

### Annual Report 1940

**Amerikanische:**
- Vereinigte Staaten von Amerika (Bund): 35,088,000.00
- Staaten und Städte: 4,120,000.00
- Eisenbahnen: 18,117,258.16
- Elektrizitäts-Unternehmungen ("Public Utilities"): 13,809,500.00
- Industrie-Unternehmungen: 7,265,095.04

**Canadische:**
- Dominion, Provinzen, Städte, Eisenbahnen: 3,867,228.40
Institutional Investors
The history of professional fund management

_eabhi_ in cooperation with Schroders and Banque Lombard Odier

26 October 2018, London, UK