Pension Fund Investments and Liquidity*

Aleksandar Andonov Kristy A.E. Jansen Joshua D. Rauh

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1 Motivation

Pension funds own a large proportion of stocks and bonds around the globe, and their asset management decisions can influence the volatility and prices of financial securities. Among the different types of institutional investors, pension funds are often perceived as liquidity providers in financial markets as they have a long-term investment horizon and predictable liabilities for retirement benefit payments (e.g., Campbell and Viceira, 2002; Cochrane, 2022). However, even though pension funds have long-term liabilities, their liquidity is becoming an increasing concern for the following reasons.

First, pension funds are maturing and their inflows from contributions are smaller than their outflows for benefit payments. This cash flow shortfall implies that pension funds are becoming regular net sellers in financial markets as they need additional cash to cover the benefit payments. Figure 1 Panel A shows that U.S. public pension funds had a negative net cash flow of $100 billion in 2022, which corresponds to 2% of their assets. The net cash flow varies significantly over time and across pension funds. In addition, freezes of contribution payments by state and local governments, which for instance occurred after the Great Recession, can expose pension funds to unexpected liquidity shocks and give rise to additional selling of assets.

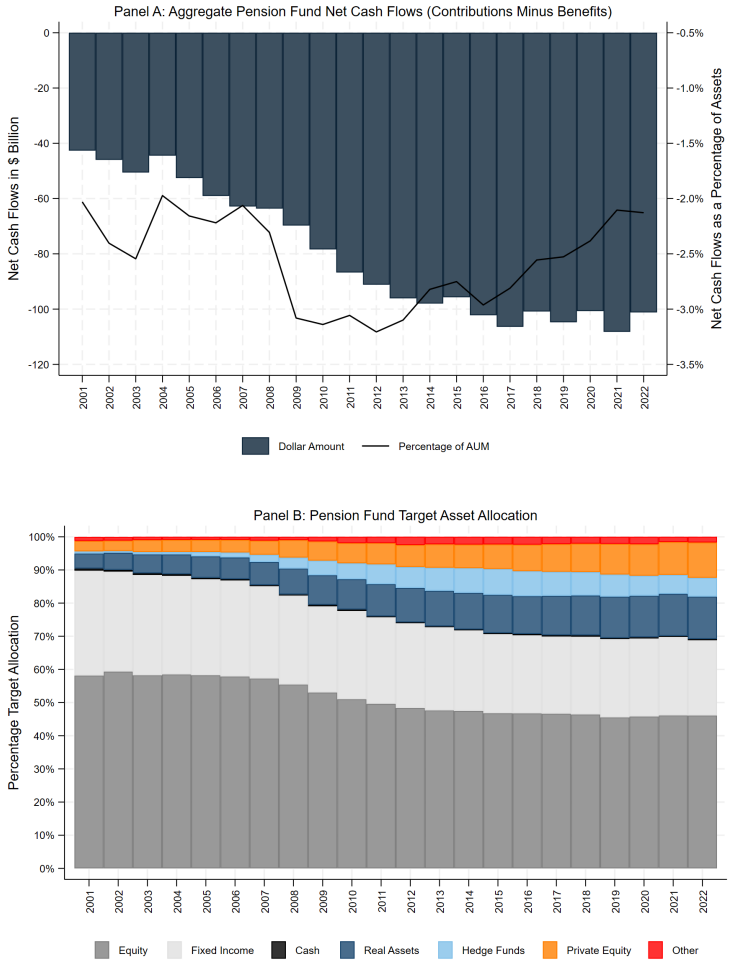
Second, even though their liquidity needs are rising, pension funds have increased their allocation to illiquid private markets (e.g., Andonov and Rauh, 2022; Begenau, Liang, and Siriwardane, 2023). Figure 1 Panel B shows that U.S. public pension funds have increased their allocation to alternative assets from 10% in 2001 to 30% in 2022. In private markets, the majority of institutional investors act as limited partners and commit capital to closed funds. This investment structure implies that pension funds do not control the cash flows as the general partners decide on the timing of capital calls and distributions from private funds. The high allocation to private markets and limited ability to influence cash flows potentially expose pension funds to correlated liquidity shocks.

Third, pension funds are increasingly using more leverage as well as relying more on derivatives to take more risk, match their liabilities, or hedge against interest rate movements. For example, CalPERS and Pennsylvania School ERS have 5% and 10% leverage in the target asset allocation, respectively. The increased use of leverage and derivatives implies that standard measures of pension fund risk-taking based on the percentage allocation to equities or alternatives may not capture precisely their risk exposure. In addition, leverage and derivatives can potentially expose pension funds to correlated margin calls and other negative cash flow shocks, such as the LDI-crisis among the U.K. pension funds (e.g., Pinter, 2023; Jansen, Klingler, Ranaldo, and Duijm, 2024).

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Figure 1: Pension Fund Net Cash Flows and Asset Allocation

Panel A presents the aggregate net cash flows of U.S. public pension funds. The net cash flows are measured as the difference between the inflows from contribution payments and the outflows for pension benefit payments and administrative expenditures. Panel B shows the average target asset allocation policy of pension funds.



2 Holdings Data and Empirical Setting

There is no publicly available dataset on pension fund holdings even though their participants generally cannot choose whether to join the pension system, and the taxpaying public is largely liable for unfunded liabilities. Other institutional investors, such as mutual funds and insurance companies, need to frequently disclose their holdings, but pension funds are not covered by any regulatory disclosure requirements. The 13F dataset is the only publicly available source with some information on pension fund holdings. However, the 13F data covers only the direct U.S. equity holdings of pension funds, so all their domestic and international equity holdings that are managed through external asset managers cannot be identified and studied. In addition, there is no information on their fixed income holdings, derivatives positions, and commitments to private funds.

To obtain a comprehensive and granular overview of pension funds' investments and exposure to liquidity risk, we collect detailed holdings data on their investments through Freedom of Information

Table 1: FOIA Requests Coverage and Progress

This table summarizes our progress with collecting pension fund holdings data using FOIA requests. We classify a response as successful when a pension fund provides all its positions over a period of at least two years. For successful responses, we show the number of pension-fund-quarter observations with holdings data and the average number of positions per pension-fund-quarter observation.

	N
Contacted pension funds	170
Successful responses as of May 2024	65
Successful responses expected in the near future	25
Pension fund-quarter observations	2,445
Average number of positions per pension-fund-quarter observation	4,661

Act (FOIA) requests. Specifically, we have asked U.S. public pension funds about their equity, fixed income, and derivatives positions on a quarterly basis over the 2000–2023 period. Table 1 summarizes our coverage and progress of the FOIA requests. We have reached out to 170 pension funds and to date, we have obtained successful responses from 65 pension funds. We classify a response as successful when a pension fund provides all its positions over a period of at least two years. Over the next few months, we expect to receive successful responses from an additional 25 pension funds, which will increase our total coverage to $2.54 trillion in assets under management in 2021.

Table 2 shows the investments per asset category of two pension-fund-quarter observations as an example of the granularity and richness of our hand-collected holdings data. We report the holdings of CalPERS, as an example of a large pension fund, and Nevada PERS, a mid-sized pension fund. The holdings data enables us to identify positions that pension funds hold directly and through multiple asset managers, so even within the same security (ISIN), a pension fund can have multiple positions. The examples also highlight the heterogeneity among pension funds in the usage of derivatives, international diversification, and risk-taking within an asset class. We can use the holdings data to examine pension fund sales and purchases on a quarterly basis and analyze their role in equity markets, fixed income markets, derivatives, and international capital flows.

We augment the holdings data with information on pension fund characteristics and net cash flows from the Public Plans Data (PPD) provided by the Center for Retirement Research at Boston College. For local and county pension funds that are not covered in PPD, we manually hand-collect the information from their annual reports. We also merge the holdings data with Preqin to obtain pension fund commitments, capital calls, and distributions from closed private funds in private equity, private credit, real estate, and infrastructure. The merger of these datasets allows us to link the liquidity shocks arising from contributions, capital calls, and margin calls on derivative positions, to the pension fund asset allocation policy and trading decisions on a security level.

3 Research Questions

3.1 The Effect of Liquidity on Asset Allocation and Performance

Portfolio theory on asset-liability management argues that the heterogeneity in liquidity needs across pension funds should be reflected in their strategic asset allocation policy and risk-taking (Campbell and Viceira, 2002). We will examine the relation between the pension fund asset allocation and cash flow profiles. First, we will analyze whether mature pension funds with significantly higher outflows

Table 2: Example of CalPERS and Nevada PERS Investment Holdings 2021Q1

This table shows the investments of CalPERS and Nevada PERS in 2021Q1 as an example of the granularity of our holdings data. We report the investments in $ billions, the number of unique securities (ISINs), and the total number of positions per category. The dollar amounts for equities, fixed income, alternative assets, cash, and total investments are market values. Derivative exposures are computed using net notional amounts.

	CalPERS			Nevada PERS		
Category	**$ (billion)**	**# ISINs**	**# Positions**	**$ (billion)**	**# ISINs**	**# Positions**
Equities	225.86	10,491	19,375	34.04	1,470	5,428
Domestic equities	122.23	3,161	6,631	23.37	483	2,395
International equities	103.63	7,330	12,744	10.66	987	3,033
Fixed Income	127.03	5,767	8,017	14.89	93	165
Government bonds	42.40	186	206	14.89	91	163
Corporate bonds	42.17	2,828	5,054	0.00	0	0
Mortgage-backed securities	30.98	2,627	2,631	0.00	2	2
Other	11.48	126	126	0.00	0	0
Alternative assets	83.95	922	1,289	6.00	353	353
Private equity	41.04	439	444	3.64	310	310
Real estate	42.91	483	845	2.36	43	43
Cash and Cash Equivalents	14.91	191	661	1.01	15	64
Total Investments	451.75	17,371	29,342	55.95	1,931	6,010
Derivatives (net notional)	9.18	135	135	0.00	0	0
Equity	0.01	51	51	0.00	0	0
Fixed Income	9.17	84	84	0.00	0	0

than inflows have a lower allocation to risky assets or more specifically to illiquid alternative assets. Second, we will analyze within a pension fund how the variation in cash flows over time is incorporated in the strategic asset allocation. Third, we will examine whether investment performance conditional on asset allocation differs for pension funds with larger negative outflows, given the possibility that they need to liquidate positions to pay benefits.

Using the hand-collected holdings data, we can also examine risk-taking and performance within equities and fixed income, which is impossible with publicly available datasets based on pension fund annual reports. For instance, Table 2 already suggests that CalPERS and Nevada PERS differ significantly in their risk-taking within fixed income. Nevada PERS holds only government bonds, while CalPERS has a 57% exposure to corporate bonds and mortgage-backed securities.

3.2 Liquidity Management and Trading Decisions

The cash flows that pension funds experience from contribution inflows, benefit payments, capital calls from private funds, or margin calls on derivatives positions have to be reflected in their asset purchases and sales. We aim to understand the type of assets that pension funds choose to sell. As a benchmark hypothesis, we might expect pension funds to sell their most liquid positions first, following the pecking order of liquidity (e.g., Ben-David, Franzoni, and Moussawi, 2012; Ma, Xiao, and Zeng, 2022). However, as pension funds aim to maintain a strategic asset allocation, they may decide to sell securities from the asset class in which they have an overweighted exposure. Second, our data allows us to differentiate between pension fund direct holdings and indirect holdings through external asset managers. We can study how pension funds decide on which managers to approach with liquidity-driven redemption requests and how external managers process these requests.

3.3 Financial Market Stabilization vs Amplification

Since pension funds are large institutional investors, we expect their asset sales and purchases could have a substantial impact on asset prices. Hence, once we understand the type of assets pension funds sell, it is important to study the asset pricing implications and what this implies for financial stability. Conventional wisdom considers pension funds as long-term investors that stabilize markets (e.g., Timmer, 2018; Chodorow-Reich, Ghent, and Haddad, 2021). However, their exposure to liquidity risk may require them to liquidate assets at a time that amplifies market movements, as became apparent during the U.K. pension crisis. This analysis will contribute to the asset pricing literature on the macro and micro-price elasticities of demand in financial markets and the commonality in liquidity shocks across asset classes.

3.4 Fiscal Shocks

Pension fund cash flow requirements can have substantial dampening effects on the asset accumulation and capital expenditures of the sponsoring entity (Rauh, 2006). Given that public pension funds are becoming more cash-constrained, we explore the implications of pension fund liquidity needs for public finances on the sponsoring entities of state and local governments. We plan to run this analysis within different states. For example, within California, there is significant variation in pension arrangements across municipalities. Some cities and counties participate in the state system CalPERS, and some do not. Other states have similar dichotomies. State governments contributed $151.46 billion to pension funds in 2022 compared to 2021 own source general revenue of $1.684 trillion, amounting to on average 9% of lagged own source general revenue being contributed to pensions. In some cases this ratio is much larger. For example, Illinois contributed $12.73 billion to state pension funds in 2022, amounting to 19.2% of lagged own source general revenue. We will examine the potential spillovers from negative investment performance and cash flow needs for the services provided by state and local governments.

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Pension Fund Investments and Liquidity

Summary on Public Policy Implications

This project will study how asset management decisions of pension funds can influence asset prices and the liquidity of financial markets. Liquidity management of pension funds is becoming an increasing concern. In many cases, pension funds are experiencing negative outflows as their benefit payments are substantially larger than the contribution inflows. Public pension funds have also allocated increasingly large fractions of their assets to illiquid private assets classes, and are using more leverage and derivatives in their investment decisions, in part in an attempt to address their funding gaps.

Our main research question is how pension funds affect financial markets through their cash flow needs. We plan to analyze hand-collected granular data from FOIA requests on their holdings in equity, fixed income, private funds, and derivatives. The holdings data enables us to study how liquidity shocks are absorbed across entire portfolios of assets and the extent to which sales have a lasting impact on asset prices. These questions are impossible to assess with publicly available datasets on pension funds.

Our results will contribute to a better understanding of the exposure of pension funds to cash flow shocks and whether these shocks are transmitted to the underlying asset managers and financial securities. For policymakers, our research will provide insights into the liquidity demands of pension funds which will become more important as the public defined benefit sector is maturing and state and local governments have increasingly limited fiscal space to support their retirement systems. In terms of broader implications for financial stability, even institutional investors that do not experience cash flow shocks will be exposed to volatility and price inelasticity, as they delegate investment mandates to the same asset managers and invest in the same underlying assets as pension funds exposed to cash flow shocks.

Conflict of Interest Statements

Aleksandar Andonov: No conflicts of interest to disclose. I have no ties to financial institutions or firms that may be affected by the proposed research.

Kristy A.E. Jansen: No conflicts of interest to disclose. I have no ties to financial institutions or firms that may be affected by the proposed research.

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Research Interests

Institutional investors, pension funds, asset management, alternative asset classes and governance.

Academic Positions

2023 – present	**Professor of Finance** University of Amsterdam Amsterdam Business School, Finance Group
2018 – 2023	**Associate Professor of Finance** University of Amsterdam Amsterdam Business School, Finance Group
2014 – 2018	**Assistant Professor of Finance** Erasmus University Rotterdam Erasmus School of Economics, Finance Group

Education

2009 – 2014	**Ph.D. Finance**, Maastricht University (Netherlands)
2008 – 2009	**MSc. Finance**, Maastricht University (Netherlands)
2003 – 2007	**BSc. Economics**, University Ss. Cyril and Methodius (North Macedonia)

Visiting Positions and Research Affiliations

2019 – present	**Research Affiliate**, Centre for Economic Policy Research (CEPR) Asset Pricing Programme
2017 – present	**Visiting Scholar**, Stanford University (USA) Hoover Institution
2014 – present	**Research Fellow**, Tinbergen Institute Finance Field
2013	**Visiting Graduate Student**, University of Notre Dame (USA) Mendoza College of Business, Finance Department
2012	**Visiting Graduate Student**, Yale University (USA) Yale School of Management, International Center for Finance

Publications

1. Delegated Investment Management in Alternative Assets, 2024, *Review of Corporate Finance Studies*, 13(1), 264–301. [Paper]

2. The Return Expectations of Public Pension Funds (with Joshua Rauh), 2022, *Review of Financial Studies* 35(8), 3777-3822. [Paper] [Data]

Publications

3. Institutional Investors and Infrastructure Investing (with Roman Kraussl and Joshua Rauh), 2021, *Review of Financial Studies* 34(8), 3880-3934. [Paper]

4. Political Representation and Governance: Evidence from the Investment Decisions of Public Pension Funds (with Yael Hochberg and Joshua Rauh), 2018, *Journal of Finance* 73(5), 2041-2086. [Paper] [Data]

5. Pension Fund Asset Allocation and Liability Discount Rates (with Rob Bauer and Martijn Cremers), 2017, *Review of Financial Studies* 30(8), 2555-2595. Editor's choice. [Paper]

6. Intermediated Investment Management in Private Markets: Evidence from Pension Fund Investments in Real Estate (with Piet Eichholtz and Nils Kok), 2015, *Journal of Financial Markets* 22, 73-103. [Paper]

7. A Global Perspective on Pension Fund Investments in Real Estate (with Piet Eichholtz and Nils Kok), 2013, *Journal of Portfolio Management* 39(5), 32-42. [Paper]

8. TIPS, Inflation Expectations, and the Financial Crisis (with Florian Bardong and Thorsten Lehnert), 2010, *Financial Analysts Journal* 66(6), 27-39. [Paper]

Working Papers and in Progress

1. The Shifting Finance of Electricity Generation (with Joshua Rauh), 2024. [Paper]

2. Choosing Pension Fund Investment Consultants (with Matteo Bonetti and Irina Stefanescu), 2024. [Paper]

3. Overallocated Investors and Secondary Transactions (with Rustam Abuzov and Josh Lerner), 2024.

4. Target Date Funds and International Capital Flows (with Esther Eiling and Danjun Xu), 2024.

5. Can Large Pension Funds Beat the Market? Asset Allocation, Market Timing, Security Selection and the Limits of Liquidity (with Rob Bauer and Martijn Cremers), 2012. [Paper]

Policy Briefs and Blogs

1. UN PRI Blog: The underperformance of public institutional investors in infrastructure, 2021. (with Joshua Rauh) [Blog]

2. Stanford SIEPR Policy Brief: Can institutional investors fill the infrastructure gap? 2021. (with Joshua Rauh) [Brief]

3. MeJudice: Pensioenfondsen Zijn Goed in Staat Zelf te Beleggen in Vastgoed (with Piet Eichholtz) [Blog]

Selected Conference and Seminar Presentations (* indicates presentations by co-authors)

2024	American Economic Association; * American Finance Association; CEPR Sustainability and Public Policy Workshop; * Midwest Finance Association; BI Oslo Finance Seminar; * UNC Institute for Private Capital; * Swiss Society for Financial Market Research; CEPR European Workshop on Household Finance; * Federal Reserve Board; LBS Private Capital Symposium; NBER Pension Finance; * University of Pennsylvania the Law and Finance of PE and VC Conference; Dutch Central Bank; * LTI-Bank of Italy Workshop on Long-Term Investors; Lausanne Private Markets Research Conference; * China International Conference in Finance; University of St. Gallen Finance Seminar; NHH Bergen Finance Seminar.
2023	ASU Sonoran Winter Finance Conference; Columbia Private Equity Conference; * SFS Cavalcade; VU Amsterdam Finance Seminar; Stockholm Harnessing Finance for Climate Conference; EIOPA-ECB Research Workshop on Insurance and Pension Funds (discussion); Michigan Mitsui Finance Symposium; * Netspar International Pension Workshop;

Selected Conference and Seminar Presentations (* indicates presentations by co-authors)

2023 Lausanne Private Markets Research Conference (discussion); NBER Summer Institute Corporate Finance; Stanford SITE Climate Finance, Innovation, and Challenges for Policy; European Finance Association (session chair); UCSD Kroner Center for Financial Research; Oxford Sustainable Private Markets Conference (discussion); Imperial College Finance Seminar; * UNC Private Equity Research Symposium.

2022 ITAM Finance Conference (discussion); London Business School Private Capital Symposium (discussion); European Finance Association Doctoral Tutorial (discussion); * Frontiers of Factor Investing Conference; UNC IPC Real Estate Research Symposium; Inquire Europe & UK Autumn Seminar; Aston Business School Finance Seminar; * Lausanne Private Markets Research Conference; * INSEAD Finance Seminar; Oxford Sustainable Private Markets Conference.

2021 * Stanford GSB Finance Brownbag Seminar; International Centre for Pension Management.

2020 Yale-RFS Conference on Real and Private-Value Assets; Peking University INSE Virtual Seminar; University of Oregon Virtual Finance Seminar; European Finance Association (session chair).

2019 Aalto Helsinki Finance Seminar; Bayes/Cass Business School Finance Seminar; * NYU Stern Finance Seminar; University of Neuchatel Finance Seminar; HEC Liege Finance Seminar; Georgia State and HEC Montreal Household Finance Workshop; * FIRN Annual Conference; * Luxembourg Asset Management Summit; Nova-BPI Asset Management Conference; * Chicago Booth Political Economy of Finance Conference; MIT Golub Center for Finance and Policy Annual Conference; Montreux Private Markets Research Conference; Zurich Finance Meets Insurance Conference; Marstrand Finance Conference; INPARR Developments in Pensions Conference at OECD; European Private Equity Research Consortium; * Hoover Institution Infrastructure Conference; 4 Nations Finance Cup; NBER Long-Term Asset Management Meeting; * IPC Spring Research Symposium; * NBER Economics of Infrastructure Meeting; Netspar International Pension Workshop.

2018 Miami Behavioral Finance Conference; * London School of Economics Finance Seminar; VU Amsterdam Finance Seminar; * Stanford GSB Finance Brownbag Seminar; Maastricht University Finance Seminar; * Yale School of Management Finance Seminar; University of Amsterdam Finance Seminar; Lausanne Private Markets Research Conference; * Rotman ICPM (University of Toronto); * NBER Economics of Infrastructure Meeting; Netspar International Pension Workshop; Financial Intermediation Research Society (discussion).

2017 Stanford GSB Finance Brownbag Seminar; * University of Kentucky Finance Seminar; * University of Hong Kong Finance Seminar; * Australian National University Finance Seminar; * University of New South Wales Finance Seminar; * Carnegie-Mellon University Finance Seminar; * Luxembourg Asset Management Summit; Finance Down Under Conference; American Finance Association.

2016 NBER Entrepreneurship Meeting; * Oxford Said Business School Finance Seminar; * University of California San Diego Finance Seminar; * Stockholm School of Economics Finance Seminar; * Joint Berkeley-Stanford Finance Seminar; * Arizona State University Finance Seminar; * Harvard Business School Finance Seminar; * UNC Private Equity Research Consortium; * NBER Corporate Finance Fall Meeting; Rotman ICPM (University of Toronto); Luxembourg Asset Management Summit; European Finance Association; * NBER Summer Institute Law and Economics.

2015 EFA and WU Gutmann Symposium on Retirement and Asset Management; McGill Global Asset Management Conference; Swiss Society for Financial Market Research.

Selected Conference and Seminar Presentations (* indicates presentations by co-authors)

2014	Aalto University School of Business Finance Seminar; Moscow New Economic School Finance Seminar; Erasmus University Rotterdam Finance Seminar; World Bank / BIS Public Investors Conference; Netspar International Pension Workshop.
2013	* University of Illinois Finance Seminar; * Luxembourg School of Finance Seminar; * Federal Reserve Bank of Cleveland Public Pension Conference; Inquire Europe Autumn Seminar; Financial Management Association; AREUEA International Conference; Netspar International Pension Workshop; * Rotman ICPM (University of Toronto); Financial Intermediation Research Society (FIRS); CFR Cologne Colloquium on Financial Markets; Netspar Alternative Assets Conference; Warwick Rethinking the Economics of Pensions Conference; American Economic Association.
2012	* Ohio State University Finance Seminar; Maastricht University Finance Seminar; University of Connecticut Real Estate Seminar; * World Bank / BIS Public Investors Conference; Netspar Illiquidity Workshop; German Finance Association; Financial Management Association; European Finance Association; * Notre Dame and Nasdaq OMX Foundation Conference; Financial Intermediation Research Society; * Real Estate Research Institute (RERI); ASSA / AREUEA Doctoral Session; ASSA / AREUEA (discussion).
2011	Bayes/Cass Business School Finance Seminar; * Dutch Central Bank Seminar; Netspar Pension Day; Rotman ICPM (University of Toronto).

Academic Service and Ancillary Activities

Editor	Journal of Pension Economics and Finance, 2021–present
Journal Referee	American Economic Review, Journal of Finance, Quarterly Journal of Economics, Review of Economic Studies, Review of Financial Studies, Journal of Financial and Quantitative Analysis, Journal of Public Economics, Management Science, Review of Finance, Financial Analysts Journal
Grant Reviewer	Swiss National Science Foundation
Seminar Organizer	Erasmus University Rotterdam Finance Seminars 2017–2018
Program Committee	European Finance Association, 2020–present; Midwest Finance Association, 2024–present; SFS Cavalcade North America, 2024–present; Financial Management Association, 2012–2013
Ancillary Activities	Academic Advisor, Scotland's Local Government Pension Scheme, 2021 Collegio Carlo Alberto Program on Long-Term Investing, 2020–present Fidelity International and Maastricht University Investment Colloquium for Pension Fund Executives, 2015–2016

Research Grants, Awards and Scholarships

2023	Teacher of the Year Award of UvA MSc Finance Program
2022	UCSD Kroner Center for Financial Research Award & Support
2020	Teacher of the Year Award of UvA MSc Finance Program
2018	Netspar Comparative Research Grant
2018	Rotman ICPM University of Toronto Research Award
2017	Erasmus School of Economics Top Talent Researcher Award
2017	ERIM Award for Outstanding Performance by a Young Researcher
2016	Rotman ICPM University of Toronto Research Award

Research Grants, Awards and Scholarships

2015	Netspar Thesis Award
2013	Nick Tyrrell Research Prize
2012	Rotman ICPM University of Toronto Research Grant
2012	Inquire Europe Research Grant
2012	Eastern Finance Association Outstanding Investments Paper Award
2012	International Travel Grant, Maastricht University, METEOR
2011	RERI Research Grant, Real Estate Research Institute, Chicago
2010	Rotman ICPM University of Toronto Research Grant
2009	Maastricht University Top 3% Award
2008	Maastricht University Company Scholarship

Teaching Experience (* indicates current teaching activities)

2021 – present	**University of Amsterdam, PhD Supervision** Supervisor: Thu Nguyen (2025), Danjun Xu (2026), Andy Li (2027)
2014 – present	**University of Amsterdam, Tinbergen Institute** * Empirical Asset Pricing (10 PhD students)
2018 – present	**University of Amsterdam, Amsterdam Business School** * MSc Finance – Asset Management Track Coordinator * MSc Finance – Quantitative Finance Track Coordinator * Advanced Investments (80 MSc. students) * Master Thesis Supervision (MSc. students and MIF students) Investment and Portfolio Theory 2 (400 3-year BSc. students) Investment and Portfolio Theory 1 (400 3-year BSc. students)
2014 – 2018	**Erasmus University, Erasmus School of Economics** Advanced Behavioral Finance (250 MSc. students) Seminar Institutional Asset Management (50 MSc. students) Seminar Risk Management (25 MSc. students) Minor Behavioral Finance – Investments (200 3-year BSc. students) Master Thesis Supervision (MSc. students)
2009 – 2014	**Maastricht University, School of Business and Economics** Institutional Investors (45 MSc. students) Behavioral Finance (30 MSc. students) Finance (60 1-year BSc. students) Building an Investment Portfolio (60 3-year BSc. students) Master Thesis Supervision (MSc. students) Marble Thesis Supervision (BSc. students) Cornell Real Estate Case Competition (team of 5 BSc. students)

Selected Media Coverage

"The Return Expectations of Institutional Investors" covered in:

19 Jan 2018 Wall Street Journal: Can We Be Brutally Honest About Investment Returns?

"Political Representation and Governance" covered in:

19 Aug 2019 Pensions & Investments: Board Composition Drives Performance in Public Plans

Selected Media Coverage

"Pension Fund Asset Allocation and Liability Discount Rates" covered in:

11 Dec 2017 Pensions & Investments: Time to stop high-risk gamble
30 Jul 2016 Economist: Buttonwood – Putting it all on red
19 Jul 2013 Top1000Funds: "Assessing Reality in US Public Funds" (link)
04 May 2013 Economist: Buttonwood – Money to Burn
11 Jun 2012 Forbes: U.S. Public Pension Plans are Different (Not in a Good Way!)
28 May 2012 Financial Times: US Public Pension Funds Take on More Risk

"Can Large Pension Funds Beat the Market?" covered in:

25 May 2012 Volkskrant: Beleggen bij private equity slecht voor pensioenfondsen
24 Jan 2012 New York Times: Amid Attacks on Private Equity, Efforts to Study Its Value
23 Jan 2012 Financial Times: Investors Urge Equity Funds to Reveal Budgets
23 Jan 2012 Financial Times: Private Equity Profits Called into Question
30 Nov 2011 CBS Money Watch: Can Large Pension Funds Beat the Market?
23 Sep 2011 Financial Times: Are hedge funds the answer on pension savings?
31 Jul 2011 Financial Times: Studies Question Hedge Fund Returns
25 May 2011 Top1000Funds: Lone Wolves May Secure the Best Returns

"Intermediated Investment Management in Private Markets" covered in:

16 Nov 2012 Investment & Pensions Europe: Justifying the cost
12 Sep 2012 Bloomberg Businessweek: U.S. Funds Have Industry's Lowest Real Estate Returns

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Asset pricing, behavioral finance, non-bank financial intermediaries, and portfolio choice.

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EDUCATION
- **Tilburg University**
  - Ph.D. in Finance, 2016 - 2022.
  - Research Master in Finance (side-inflow), 2015-2016.
  - Master in Quantitative Finance and Actuarial Science, 2013-2015, *Cum Laude*.
  - Bachelor in Econometrics and Operational Research, 2010-2013, *with Distinction*.
- **University of Pennsylvania, The Wharton School**
  - Visiting Ph.D., fall 2017 and fall 2018. *Host*: Jules van Binsbergen.

EMPLOYMENT
- **Bank for International Settlements** (BIS)
  - Technical Advisor, August 2021 - December 2022.
  - Senior Associate, PhD Fellowship Programme, April - July 2021.
- **De Nederlandsche Bank** (DNB)
  - Research Affiliate, 2017 - current.
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  - Graduate Intern, 2015 - 2016.

MAIN RESEARCH PAPERS

Long-term Investors, Demand Shifts, and Yields *Job Market Paper*
Review of Financial Studies (conditionally Accepted)

Selected presentations: AEA · Chicago Booth Asset Pricing Conference · EFA · Colorado Finance Summit · FIRS · SoFiE.

Awarded with: Colorado Finance Summit Best PhD Paper Award 2021 · Inquire Europe Research Prize 2021 · SoFiE Best Paper Award 2021 · Finalist ECB's Young Economists' Competition 2020 · Inquire Europe Research Grant 2020.

Pension Liquidity Risk with Sven Klingler, Angelo Ranaldo, and Patty Duijm.

Selected presentations: EFA · NBER Pension Finance · Kentucky Finance Conference · MFA · Arizona State University · University of Arizona · BIS · Bank of England · EIOPA-ECB Research Workshop on Insurance Companies and Pension Funds.

Awarded with: Inquire Europe Research Grant 2023.
Covered in: Investments & Pensions Europe.

Do Teams Alleviate or Exacerbate Behavioral Biases? Evidence from Extrapolation Bias in Mutual Funds with Ricardo Barahona and Stefano Cassella.

Selected presentations: NBER Behavioral Finance Meeting · AFA · SFS Cavalcade North America · Stockholm School of Economics.

Which Exchange Rates Matter to Global Investors? with Hyun Song Shin and Goetz von Peter.

Selected presentations: EFA · US Dollar Conference · BIS-BoE-ECB-IMF Spillover Conference · NFA.

The Shadow Costs of Illiquidity with Bas J.M. Werker, 2022, *Journal of Financial and Quantitative Analysis*, 57(7), 2693-2723.

Covered in: PensioenPro.

Main Work In Progress

Granular Treasury Demand with Arbitrageurs with Wenhao Li and Lukas Schmid.

Awarded with: NBER Market Frictions and Financial Risks Grant 2023.

Pension Funds and Liquidity Shocks with Aleksandar Andonov and Josh Rauh.

Other Papers (peer-reviewed)

A Survey of Institutional Investors' Investment and Management Decisions on Illiquid Assets with Patrick F.A. Tuijp, 2021, *Journal of Portfolio Management*, 47 (3), 135-153.

Covered in: Canadian Investment Review · the Association of Canadian Pension Management (the Observer) · PensioenPro.

Pension Fund's Illiquid Assets Allocation Under Liquidity and Capital Requirements with Broeders, D.W.G.A., and Werker, B.J.M., 2021, *Journal of Pension Economics and Finance*, 20(1), 102-124.

Covered in: Top1000funds.com · PensioenPro.

Awards, Honors, and Scholarships

- NBER Market Frictions and Financial Risks 2023 $200,000 (with Wenhao Li and Lukas Schmid).
- Inquire Europe Research Grant 2023 €10,000 (with Sven Klingler and Angelo Ranaldo).
- Netspar Thesis Award Winner 2022 €3,000.
- Colorado Finance Summit Best PhD Paper Award 2021 $2,000.
- Inquire Europe Research Prize 2021 €4,000.
- Society for Financial Econometrics (SoFiE) Best Paper Award 2021 $500.
- Finalist at the ECB Young Economists' Competition 2020.
- Selected Research Proposal European Insurance and Occupational Pensions Authority (EIOPA) 2021.
- Inquire Europe Research Grant 2020 €10,000.

- Semi-finalist Best Paper Award FMA 2019.
- Netspar Individual Research Grant 2019 €40,000.
- Inquire Europe Research Grant 2018 €10,000 (with Dirk Broeders).
- AFA Doctoral Student Travel Grant 2018 $775.
- Instituut Gak Research Grant 2016 €200,000.
- Excellence Scholarship Tilburg University 2010 €3,000.

Presentations (including scheduled)

* indicates presentation by coauthor

- **2024**: *Seminars*: SF FED
  Conferences: EFA (2x) · Wharton Asset Pricing Conference · NBER Pension Finance · Erasmus Liquidity Conference* · 10th BI-SHoF Conference on Asset Pricing and Financial Econometrics · Conference on International Roles of the U.S. Dollar · BIS-BoE-ECB-IMF Spillover Conference* · Kentucky Finance Conference · 3rd Spring Finance Workshop* · Swiss Financial Intermediation Conference* · EFA (US) · MFA · Inquire U.K.
  Discussions: MFA (2x) · EFA

- **2023**: *Seminars*: Bank of England · University of St. Gallen · BIS · Arizona State University · University of Arizona · Fidelity Investments · Financial Stability Board · PGGM · De Nederlandsche Bank · USC Marshall · ICPM (webinar) · University of Cologne
  Conferences: NFA · ECBE Conference Harvard · EIOPA-ECB Research Workshop on Insurance Companies and Pension Funds · AEA · AFA*
  Discussions: FX Workshop Bank of Canada · WFA · USC Marshall PhD Conference · Tilburg Finance Summit on Long-run Drivers of Asset Prices · SFS Cavalcade (North America)

- **2022**: *Seminars*: Stockholm School of Economics* · UNC Kenan-Flagler · Copenhagen Business School · FED Board · Imperial College London · Duke University · UW Foster · McGill Desautels · UTD Jindal · Dartmouth Tuck · OSU Fisher · HEC Paris · Frankfurt School · USC Marshall · BI Oslo · Colorado-Boulder · Purdue · Erasmus School of Economics · Amsterdam Business School · BIS · Bocconi · UBC Sauder · Oxford Saïd
  Conferences: Chicago Booth Asset Pricing Conference · USC Social Behavioral Finance Conference · EFA · Research in Behavioral Finance Conference* · SFS Cavalcade (North America)*
  Discussions: EFA · Swiss Winter Conference

- **2021**: *Seminars*: SoFiE (webinar) · Tilburg University (Finance, 2x) · Tilburg University (Economics) · University of Bonn · BIS · ECB · Inquire Europe webinar
  Conferences: Colorado Finance Summit (job market session) · European Winter Meetings of the Econometric Society (EWMES) · NBER Behavioral Finance Meeting · Academic Research Colloquium (Washington)* · FMA (Denver) · Day-Ahead Workshop on Financial Regulation (poster, Zurich) · SoFiE Pre-Conference (San Diego) · 4th Annual Dauphine Finance PhD Workshop (Paris) · FIRS PhD session (Vancouver) · ODRF (Washington) · 2nd Frontiers of Factor Investing Conference (Lancaster University Management School)
  Discussions: International Pension Workshop (Leiden) · 28th Finance Forum (Lisbon)

- **2020**: *Conferences*: ECB's Young Economists' Competition (poster, Sintra) · EEA

(Rotterdam) · World Finance Conference (2x, Malta) · EFA (Helsinki) · PhD Mentoring Day Finance Forum (Lisbon) · ICPM webinar (Canada)* · ESSEC-Amundi Annual Workshop (Paris, postponed covid-19) · EFMA (Dublin, canceled covid-19) · Transatlantic Doctoral Conference (TADC, London Business School, canceled covid-19) · Inquire Joint Spring Seminar (Riga, postponed covid-19) · AFA PhD Poster Session

- **2019**: *Seminars*: Robeco · De Nederlandsche Bank (2x) · Tilburg University (Finance, 2x) · Maastricht University · Achmea Investment Management
  Conferences: AFBC (Sydney)* · PFMC (Paris) · Netspar Pension Day · FMA (New Orleans) ·Doctorial Consortium FMA (New Orleans) · Special PhD Session FMA (New Orleans) · Twelfth Annual SoFiE Conference (Shanghai) · Women in Finance Conference (Goethe University, Frankfurt) · International Pension Workshop
  Discussions: PFMC (Paris) · FMA (New Orleans) · International Pension Workshop

- **2018**: *Seminars*: the Wharton School · Tilburg University (Finance) · Ortec Finance (Toronto) · Cardano · Robeco
  Conferences: International Pension Workshop · Market Microstructure and High Frequency Data - The University of Chicago* · INPARR (OECD, Paris)
  Discussions: International Pension Workshop

- **2017**: *Seminars*: Tilburg University (Finance) · De Nederlandsche Bank · Maastricht University* · Ortec Finance (Rotterdam) · APG Investments
  Discussions: International Pension Workshop

Teaching Experience

Lecturer:

- Business Finance (BUAD306), Undergraduate, University of Southern California, Fall 2022 - current.
- Finance 1, Undergraduate, Tilburg University, Spring 2021.

Instructor:

- Fixed Income Analysis, Graduate, Tilburg University, Spring 2017 - Spring 2020.

Professional Service

Referee: Journal of Finance · Review of Financial Studies · Review of Asset Pricing Studies · Review of Finance · Journal of Banking & Finance · Journal of Empirical Finance · Journal of Pension Economics and Finance · Review of International Economics.

Program Committee: MFA 2024 · SFS Cavalcade (North America) 2024.

Session Chair: MFA 2024.

Organizer:

- Macro-Finance Reading Group, USC Marshall, 2023-now.
- Asset Pricing Reading Group, Tilburg University, 2019-2020.

Other Skills

Software: Matlab (advanced), Python (intermediate), R (advanced), Stata (advanced).
Languages: Dutch (native), English (fluent), German (basic).

INTERESTS

Sports: hiking, running (half/full marathons), high-intensity interval (HIIT) workouts.

REFERENCES

Bas J.M. Werker
Professor of Econometrics and Finance
Tilburg University
E-mail: b.j.m.werker@tilburguniversity.edu

Stefano Cassella
Assistant Professor of Finance
Tilburg University
E-mail: s.cassella@tilburguniversity.edu

Jules H. van Binsbergen
The Nippon Life Professor in Finance
The Wharton School
University of Pennsylvania
E-mail: julesv@wharton.upenn.edu

Ralph S.J. Koijen
AQR Capital Management Professor of
Finance and Fama Faculty Fellow
Booth School of Business
University of Chicago
E-mail: ralph.koijen@chicagobooth.edu

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Joshua D. Rauh
Stanford University

Primary Current Positions

2012–Present **STANFORD GRADUATE SCHOOL OF BUSINESS, STANFORD UNIVERSITY, STANFORD, CA**
Ormond Family Professor of Finance (2015–Present)
Professor of Finance (2012–Present)

2012–Present **HOOVER INSTITUTION, STANFORD UNIVERSITY, STANFORD, CA**
Senior Fellow (2012–Present)
Program Director, State and Local Research Team (2021–Present)
Director of Research (2018–2019)

Primary Past Positions

2019–2020 **COUNCIL OF ECONOMIC ADVISERS, EXECUTIVE OFFICE OF THE PRESIDENT**
Principal Chief Economist **(**Nov 2019–Mar 2020)

2009–2012 **KELLOGG SCHOOL OF MANAGEMENT, NORTHWESTERN UNIVERSITY, EVANSTON, IL**
Associate Professor of Finance

2004 –2009 **UNIVERSITY OF CHICAGO BOOTH SCHOOL OF BUSINESS, CHICAGO, IL**
Associate Professor of Finance (2008–2009)
Assistant Professor of Finance (2004–2008)

Other Affiliations

2005–Present **NATIONAL BUREAU OF ECONOMIC RESEARCH, CAMBRIDGE, MA**
Research Associate in Corporate Financing, Public Economics, and Aging (2009-Present)
Faculty Research Fellow in Public Economics and Aging (2005-2009)
Faculty Research Fellow in Corporate Finance (2007-2009)

2013–Present **STANFORD INSTITUTE FOR ECONOMIC POLICY RESEARCH (SIEPR), STANFORD, CA**
Senior Fellow

2022-Present **GLOBAL LIBERTY INSTITUTE, WASHINGTON, DC AND ZUG, SWITZERLAND**
Co-Founder and Board Member
Co-Director (Jan 2022–Mar 2024)

2022–Present **UNITED STATES CONGRESSIONAL BUDGET OFFICE**
Member, Panel of Economic Advisers

2023-Present **LIBERTY LENS ECONOMICS SUBSTACK**
Founder and Writer at libertylensecon.substack.com

2008–Present **NETSPAR, AMSTERDAM, NETHERLANDS**
Research Fellow

Education

2000 – 2004 **MASSACHUSETTS INSTITUTE OF TECHNOLOGY, CAMBRIDGE, MA**
Ph.D., Economics. Dissertation: "Pensions, Corporate Finance and Public Policy"
Committee: James Poterba (Chair), Stewart Myers, Jonathan Gruber, Dirk Jenter

1992 – 1996 **YALE UNIVERSITY, NEW HAVEN, CT**
B.A., Economics, *magna cum laude* with distinction

Journal Publications

[1] Rauh, Joshua, 2006, "Investment and Financing Constraints: Evidence from the Funding of Corporate Pension Plans," *Journal of Finance* 61(1), 33-71.

[2] Bergstresser, Daniel, Mihir Desai, and Joshua Rauh, 2006, "Earnings Manipulation, Pension Assumptions and Managerial Investment Decisions," *Quarterly Journal of Economics* 121(1), 157-195.

[3] Rauh, Joshua, 2006, "Own Company Stock in Defined Contribution Pension Plans: A Takeover Defense?" *Journal of Financial Economics* 81(2), 379-410.

[4] Rauh, Joshua, James Poterba, Steven Venti, and David Wise, 2007, "Defined Contribution Plans, Defined Benefit Plans, and the Accumulation of Retirement Wealth," *Journal of Public Economics* 91, 2062-2086.

[5] Rauh, Joshua, 2009, "Risk Shifting versus Risk Management: Investment Policy in Corporate Pension Plans," *Review of Financial Studies* 22(7), 2687-2734.

[6] Novy-Marx, Robert, and Joshua Rauh, 2009, "The Liabilities and Risks of State-Sponsored Pension Plans," *Journal of Economic Perspectives* 23(4).

[7] Kaplan, Steven N., and Joshua Rauh, 2010, "Wall Street and Main Street: What Contributes to the Rise in the Highest Incomes?" *Review of Financial Studies* 23(3), 1004-1050.

[8] Rauh, Joshua, and Amir Sufi, 2010, "Capital Structure and Debt Structure," *Review of Financial Studies* 23(12), 4242-4280.

[9] Novy-Marx, Robert, and Joshua Rauh, 2011, "Policy Options for State Pension Systems and Their Impact on Plan Liabilities," *Journal of Pension Economics and Finance* 10(2), 173-194.

[10] Novy-Marx, Robert, and Joshua Rauh, 2011, "Public Pension Liabilities: How Big Are They and What Are They Worth?" *Journal of Finance* 66(4), 1207-1245.

[11] Rauh, Joshua and Amir Sufi, 2012, "Explaining Corporate Capital Structure: Product Markets, Leases, and Asset Similarity," *Review of Finance* 16(1), 115-155.

[12] Novy-Marx, Robert, and Joshua Rauh, 2012, "Fiscal Imbalances and Borrowing Costs: Evidence from State Investment Losses," *American Economic Journal: Economic Policy* 4(2): 182-213.

[13] Hochberg, Yael, and Joshua Rauh, 2013, "Local Overweighting and Underperformance: Evidence from Limited Partner Private Equity Investments," *Review of Financial Studies* 26(2), 403-451.

[14] Kaplan, Steven N., and Joshua Rauh, 2013, "Family, Education, and Sources of Wealth Among the Richest Americans, 1982-2012," *American Economic Review P&P* 103(3), 158-162.

[15] Kaplan, Steven N., and Joshua Rauh, 2013, "It's the Market: The Broad-Based Rise in the Return to Top Talent," *Journal of Economic Perspectives* 27(3), 35-56.

[16] Novy-Marx, Robert, and Joshua Rauh, 2014, "Revenue Demands of Public Employee Pension Promises," *American Economic Journal: Economic Policy* 6(1), 193-229.

[17] Novy-Marx, Robert, and Joshua Rauh, 2014, "Linking Benefits to Investment Performance in US Public Pension Systems," *Journal of Public Economics* 116, 47-61.

[18] van Binsbergen, Jules, Robert Novy-Marx, and Joshua Rauh, 2014, "Financial Valuation of PBGC Insurance with Market-Implied Default Probabilities," *Tax Policy and the Economy* 28(1), 133-154.

[19] Andonov, Aleksandar, Yael Hochberg, and Joshua Rauh, 2018, "Political Representation and Governance: Evidence from the Investment Decisions of Public Pension Funds," *Journal of Finance* 73(5), 2041-2086.

[20] Giroud, Xavier, and Joshua Rauh, 2019, "State Taxation and the Reallocation of Business Activity: Evidence from Establishment-Level Data," *Journal of Political Economy* 127(3), 1262-1316.

[21] Rauh, Joshua, Irina Stefanescu, and Stephen Zeldes, 2020, "Cost Shifting and the Freezing of Corporate Pension Plans", *Journal of Public Economics* 188.

[22] Andonov, Aleksandar, Roman Kräussl, and Joshua Rauh, 2021, "Institutional Investors and Infrastructure Investing," *Review of Financial Studies* 34(8), 3880-3934.

[23] Rauh, Joshua, 2021, "Discussion of 'The Sustainability of State and Local Government Pensions: A Public Finance Approach, by Lenney, Lutz, Scheule and Sheiner," *Brookings Papers on Economic Activity*, Spring 2021: 57-64

[24] Andonov, Aleksandar and Joshua Rauh, 2022, "The Return Expectations of Public Pension Funds," *Review of Financial Studies*, Volume 35, Issue 8, August 2022, Pages 3777–3822.

[25] Giesecke, Oliver, and Joshua Rauh, 2023, "Trends in State and Local Pension Funds," *Annual Review of Financial Economics* 15, 221-238.

[26] Rauh, Joshua, and Ryan Shyu, 2024, "Behavioral Responses to State Income Taxation of High Earners: Evidence from California," *American Economic Journal: Economic Policy* 16(1), 1-55.

Current Working Papers

Andonov, Aleksandar and Joshua Rauh. 2023. "The Shifting Finance of Electricity Generation," SSRN Working Paper #4287123. First Version: November 2022.

Clemens, Jeffrey, Oliver Giesecke, Joshua Rauh, and Stan Veuger. 2023. "Where Did Pandemic-Era Fiscal Aid to States Land." First Version: December 2023.

Roman Kräussl, Joshua Rauh, and Denitsa Stefanova. 2023. "ESG Ratings and Firms' Financing Decisions." First Version: October 2023.

Giesecke, Oliver, and Joshua Rauh. 2023. "How Do Public Employees Value Defined Benefit Versus Defined Contribution Retirement Benefits?" SSRN Working Paper #4308471. First Version: December 2022.

Rauh, Joshua, 2023, "Taxes, Revenues, and Net Migration in California," SSRN Working Paper #4037764. First Version: March 2022.

Rauh, Joshua and Oliver Giesecke, 2023. "State and Local Pension Funds 2022 Update." SSRN Working Paper #467113.

Honors and Awards

2018 International Centre for Pension Management (ICPM) Research Award for "The Return Expectations of Institutional Investors" (with Aleks Andonov)

2016	Thule Foundation Research Award on Long-Term Savings
2016	International Centre for Pension Management (ICPM) Research Award for "Pension Fund Board Composition and Investment Performance: Evidence from Private Equity" (with Aleks Andonov and Yael Hochberg)
2013 – 2015	Institutional Investor Pension 40 list of most influential people in U.S. pensions
2013 – 2014	Stanford GSB Dhirubhai Ambani Faculty Fellow in Entrepreneurship
2011	Smith Breeden Prize, First Prize for "Public Pension Promises: How Big Are They and What Are They Worth" (with Robert Novy-Marx), awarded January 2012
2011	Crain's Chicago 40 Under 40
2009 – 2012	Zell Center for Risk Research at Kellogg, Faculty Fellow
2008 – 2009	Charles M. Harper Faculty Fellow, Chicago Booth
2008 – 2009	Initiative on Global Markets at Chicago Booth, research support
2008	GARP Risk Management Research Program for "The Intergenerational Transfer of Public Pension Promises" (with Robert Novy-Marx)
2007 – 2008	International Centre for Pension Management (ICPM) grant (with Irina Stefanescu)
2006	Brattle Prize, First Prize for "Investment and Financing Constraints: Evidence from the Funding of Corporate Pension Plans," awarded January 2007
2004	National Tax Association Dissertation Award (Co-Winner)
2004	Barclays Global Investor Best Symposium Paper, European Finance Association (for "Managerial Opportunism and Earnings Manipulation: Evidence from Defined Benefit Plans," with Daniel Bergstresser and Mihir Desai)
2004	Western Finance Association Award for the Best Paper in Corporate Finance (for "Investment and Financing Constraints: Evidence from the Funding of Corporate Pension Plans")
2003 – 2004	NBER Pre-Doctoral Fellowship
2002 – 2003	Center for Retirement Research Dissertation Fellow
1996	Phi Beta Kappa

Invited Presentations, Lectures, Roundtables, and Panels,

Friedberg Economics Institute, Jerusalem, Israel, April 2024, on "The Role of Government and the Free Market Economy," and "Inequality"

Employee Owned S-Corporations of America, Invited Lecture, October 2023

University of Texas Salem Center, Policy@McCombs, Lecture, "Investing for Society? Why We Should Preserve Shareholder Capitalism and How to Do It," March 2023

Fiscal Policy Roundtable, 21st Century Alliance and Legislative Members, Sacramento, CA, March 2023

Hoover Institution Pasadena Conference, January 2023

Federal Reserve Bank of New York, Visitor, December 5-6, 2022

University of Luxembourg Alternative Investments Conference, on "Institutional Investments in Infrastructure" and "Panel: Financing Energy – the Role of Alternative Investments," November 2022

Goethe University Frankfurt & ICIR Digital Insurance Forum on "Pension Finance and Long-Run Productivity", November 2022

SIEPR Tax Policy Forum, October 2022

John R. Raben/Sullivan & Cromwell Fellowship Lecture, Yale Law School, "Regulating Investment Management and Retirement Plans in the Age of ESG," September 2022

Friedberg Economics Institute, Jerusalem, Israel, September 2022, on "The Role of Government and the Free Market Economy," and "Shareholder vs Stakeholder Capitalism"

Congressional Testimony before the United States Congressional Joint Economic Committee, "Why We Should Preserve Shareholder Capitalism," March 2022

Hoover Institution, Fall Retreat, October 2021

Hoover Institution Economic Policy Working Group, May 2021

Brookings Institution BPEA Spring 2021 Conference, March 2021

State and Local Public Finance in the Wake of the Pandemic, Griswold Center for Economic Policy Studies, Princeton University, March 2021

London Business School AQR Insight Summit, November 2020

NBER Asset Pricing Meeting, Panel Discussion on "The Future of Pensions," November 2020

University of Chicago Policy Forum, "The Pension Crisis: State and Local Challenges," November 2019
Hoover Institution Dallas Breakfast, February 2019
Congressional Testimony, July 2018, before the Joint Select Committee on Solvency of Multiemployer Pension Plans, United States Senate & United States House of Representatives
American Finance Association Panel: Business and Capital Taxation, Chair, January 2018
Schnatter Institute for the Study of Free Enterprise, University of Kentucky, "Pensions in Kentucky: Hidden Debt, Hidden Deficits," 2017
California State Association of County Retirement Systems, Presentations on GASB 67 and Infrastructure, UC Berkeley, July 2017
OECD INPARR Seminar, Paris, "The Future of (Partially) Funded Pension Systems," June 2017
Texas A&M Kirby Visiting Fellow Lecture, April 2017
Public Pension Funds Panel Session, American Finance Association meetings, January 2017
California State Association of County Retirement Systems, Presentations on Pension Accounting, UC Berkeley, July 2016
Lecture on The Public Pension Crisis, George Mason University Judicial Education Program: April 2014, September 2014, October 2015, March 2016
Lecture on The Public Pension Crisis, George Mason University Attorney General Education Program: October 2015
Hoover Institution, Fall Retreat, October 2015, "State Taxation and the Reallocation of Business Activity"
University of Oregon, April 2015, "The Retirement Crisis"
Kauffman Fellows Program, January 2015
Penn Institute for Urban Research, "Urban Fiscal Stability and Public Pensions,", November 2014
Hoover Institution, Conference on Inequality in Memory of Gary Becker, September 2014
Public Employee Retirement Discussion, University of Florida, April 2014
The Public Pension Crisis: Causes and Consequences, University of California at Irvine, April 2014
North Carolina State University Sustainability in Research, April 2014
Top 1000 Funds Investment Think Tank, January 2014
SIFR Institute for Financial Research Workshop on Pensions and Insurance, December 2013
Hoover Institution, Fall Retreat, October 2013
Hoover Institution, Spring Retreat, April 2013
Hoover Institution, Southern California Conference, January 2013
Netspar International Pension Workshop, Keynote Lectures, January 2013
The Pension Crisis: Public and Private, American Finance Association meetings, January 2013
Hoover Institution, Economic Policy Lunch, November 2012
Hoover Institution, Fall Retreat, October 2012
Anton Lippitt Conference on Urban Affairs, Taubman Center, Brown University, October 2012
Paul A. Grosch Lecture Series, Loyola Marymount University, October 2012,
Yale Law School, March 2012, Weil, Gotshal & Manges Roundtable at the Yale Law School Center for the Study of Corporate Law
Federal Reserve Bank of Atlanta, October 2011, Public Affairs Forum Speaker
Searle Center Conference on Government Unions in the United States, Northwestern University School of Law, October 2011, Presenter
Manhattan Institute, September 2011, Panelist for "A New Social Contract: Reforming the Terms of Public Employment in America"
Stanford University, June 2011, Participant, "State and Municipal Fiscal Default Workshop"
Yale Law School, June 2011, Corporate Law Alumni Breakfast, New York City
Congressional Testimony, February 2011, House Subcommittee on Courts, Commercial, and Administrative Law, hearing on "The Role of Public Employee Pensions in Contributing to State Insolvency and the Possibility of a State Bankruptcy Chapter"
The Public Employee Pension Crisis in California, 2010, presentation at a roundtable hosted by Governor Arnold Schwarzenegger.
The Public Employee Pension Crisis in South Carolina, 2010, presentation at a roundtable hosted by Governor Mark Sanford.

Academic Seminars and Conference Presentations

2004 University of Chicago Graduate School of Business, University of Pennsylvania (Wharton), Princeton, Kennedy School of Government, Harvard Business School, Stanford Graduate School of Business, Harvard (economics department), Columbia Business School, NYU (Stern), Dartmouth (Tuck), Michigan (Ross), Boston College (Carroll), Northwestern (Kellogg), Duke (Fuqua), Stockholm School of Economics, Ohio State University (Fisher), London Business School, Population Association of America meetings (Boston), Securities and Exchange Commission, Western Finance Association meetings (Vancouver)

2005 American Finance Association meetings (Philadelphia), Taxing Corporate Income in the 21st Century (Conference at the Ross School of Business at the University of Michigan, Co-sponsored by the Office of Tax Policy Research and the Burch Center), NBER Conference on the Economics of Aging (Boulders, Arizona), European Central Bank (Joint Lunchtime Seminar Series of the ECB, CFS and Deutsche Bundesbank), NBER Summer Institute Public Finance Meetings, Michigan State University (Broad), University of Illinois (College of Business), National Tax Association meetings (Miami)

2006 Washington University Corporate Finance Conference, MIT Sloan Batterymarch Finance Seminar, Trans-Atlantic Public Economics Seminar / TAPES (Stockholm), Retirement Research Consortium / RRC Conference (Washington, DC), NBER Summer Institute Corporate Finance Meetings, Harvard University Financial Economics Seminar, London School of Economics Finance Lunch Workshop, LSE / UBS Pensions Research Programme Conference (London)

2007 University of Southern California (Marshall), Arizona State University, Swedish Institute for Financial Research, Stockholm School of Economics, NBER Summer Institute Corporate Finance Meetings, Chicago GSB Finance Workshop, European Central Bank Conference on Monetary Policy Transmission, Tilburg University, Maastricht University

2008 Columbia GSB, NYU/Penn Conference on Law and Finance, University of Maryland (Smith), European Finance Association (Athens), Purdue (Krannert), Wharton Risk and Insurance, NTA Meeting on State and Local Fiscal Sustainability, Norwegian School of Economics and Business Administration, University of Illinois, Georgetown (McDonough), University of Minnesota (Carlson)

2009 Netspar Pension Conference (Amsterdam), MIT Bradley Public Economics Workshop, Society of Actuaries Public Pension Plan Finance Symposium, ICPM Discussion Forum, Kellogg School of Management, University of Texas at Austin (McCombs), Stanford Graduate School of Business, University of California - Berkeley (Haas), HEC Lausanne, Toronto (Rotman)

2010 Netspar Pension Conference (Amsterdam), New York University (Stern), Netspar (Zurich), Trans-Atlantic Public Economics Seminar / TAPES (Varenna), NBER Corporate Finance Summer Institute, NBER Conference on State and Local Pensions (Jackson Hole, WY), Yale Law School, Brookings-Nomura-Wharton Conference (Washington DC), London School of Economics, London Business School, University of Georgia

2011 American Finance Association meetings (Denver), University of Florida (Warrington - Finance), University of British Columbia (Sauder – Finance), Harvard University (Public Finance Seminar), HEC Paris, Oxford (Saïd Finance), University of Lugano, Yale University (Finance), London Business School Private Equity Symposium, European Finance Association (Stockholm), Chicago Fed, MIT Sloan (Finance), Wharton Business and Public Policy

2012 Netspar Pension Conference (Amsterdam), Stanford GSB Finance, University of Oregon, Universidad Carlos III (Madrid), European Financial Management Association (Barcelona), NBER Conference on State and Local Pensions (Jackson Hole, WY), Nova Finance Center 2012 Conference on Pensions and Retirement (Lisbon), ESMT-Humboldt University Berlin, University of Vienna

2013 American Finance Association meetings (San Diego), Netspar Pension Conference (Amsterdam), Journal of Investment Management Private Equity Conference at Stanford, Carnegie-Mellon University (Tepper), Stanford Finance Group Lunch, Deutsche Institut für Wirtschaftsforschung (Berlin), Conference on State and Local Health Plans Conference (Jackson Hole, WY), Tax Policy and the Economy (Washington DC), SIEPR Working Longer and Retirement Conference, SIFR Institute for Financial Research Conference on Pensions and Insurance

2014 University of California at Irvine, University of Florida, University of Maastricht, Stanford Finance Group Research Lunch

2015 Stanford Finance Group Research Lunch, NYU Stern, National Tax Association Meetings (Boston), NBER Public Finance Fall Meetings (Stanford)
2016 American Economics Association Meetings (San Francisco), Hoover Economic Policy Lunch, Harvard Business School, Arizona State University, Berkeley-Stanford Joint Finance Seminar, Stockholm School of Economics, Federal Reserve Board, Luxembourg School of Finance
2017 Tilburg University, Erasmus University Rotterdam, Texas A&M, University of Kentucky Finance/Economics Joint, Harvard Kennedy School Conference on The Risks of State Pension Underfunding, Luxembourg 6th Asset Management Conference, Stanford Finance Group Research Lunch, 19th Annual NBER-ICRIER-NCAER Neemrana Conference (India)
2018 Yale University (SOM Finance), Bundesbank-Riksbank-DNB Annual Macroprudential Conference (Stockholm), Stanford GSB Finance Research Lunch, London School of Economics, Bank of England, 9th Annual Miami Behavioral Finance Conference
2019 NBER Long-Term Asset Management, North Carolina Private Equity Research Conference (PERC), Swiss Finance Institute Finance Meets Insurance Conference (Zurich), New York University (Stern), University of Chicago Stigler Center Political Economy of Finance Conference, Luxembourg 8th Asset Management Summit, NBER Public Economics Meeting (Chicago)
2021 Stanford Finance Group Research Lunch (2x), University of Pennsylvania (Wharton Finance/ Micro)
2022 Stanford Finance Group Research Lunch, INSEAD Finance, University of Amsterdam Finance
2023 Frankfurt School of Finance, CEPR European Conference on Household Finance (Turin), Stanford SITE, Stanford Finance Group Research Lunch (2x)
2024 American Economics Association Meetings (San Antonio), University of Texas at Austin (McCombs), LSE Workshop on Taxes and Migration

Opinions and Other Short Pieces – Externally Published

Aharon Friedman and Joshua Rauh, "Hamas, and America's Reactionary Progressives," *The Epoch Times*, 19 December 2023

Joshua Rauh and Seamus Duffy, "Is the United Auto Workers union idling in the past?" *Boston Globe*, 27 September 2023

Aharon Friedman and Joshua Rauh, "The Biden Administration Wants Taxation without Representation," *National Review Online*, 14 August 2023

Joshua Rauh and Gregory Kearney, "The Economists Who'd Rather Be Influencers," *Wall Street Journal*, 17 July 2023.

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Jillian Ludwig and Joshua Rauh, "Newsom's homelessness plan: money for nothing," *Orange County Register*, 10 December 2022.

Joshua Rauh and Kevin Warsh, "The Inflation Mess and a Financial Refuge," *Wall Street Journal*, 21 February 2022.

" 'Net Zero' Will Make Wall Street Richer At Main Street's Expense," *Wall Street Journal*, 11 November 2021

"The Biden Administration's Global Tax Imperialism" with Aharon Friedman, *National Review Online*, 28 June 2021

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"Municipal bond investors have to share the burden in state bailouts," *The Hill*, 17 September 2020

"California's Tax the Rich Folly," *Orange County Register*, 1 August 2020

"Muni bond investors could lose out as pension crisis cripples many U.S. cities" with Robert Pozen, *Marketwatch,* 8 June 2020

"How to pay for stimulus checks" with Andrew Biggs, *The Hill*, 27 April 2020

"Don't use coronavirus as excuse to bail out state, local governments that have mismanaged finances for decades," *Fox Business*, 13 April 2020

"Congress should let airlines go to bankruptcy court," *Chicago Tribune*, 28 March 2020

"The Burden of Public Pension Promises on State and Local Budgets," with Daniel Bergstresser, December 2018, published on EconoFact.org
"Unfunded Pension Debts of U.S. States Still Exceed $3 Trillion," 2015, *Forbes* / *Investing* PRC Blog
"Relief for Cities' Budget-Busting Health-Care Costs," *Wall Street Journal*, 26 July 2015
"The Pension Black Hole," *Providence Journal*, 10 January 2013
"Our Expensive Pension Crisis," *Washington Post,* 21 October 2012
"Start Paying or Stop Promising," *New York Times Room for Debate*, 27 February 2011
"New York City, Living in Fantasy Land," *New York Times Room for Debate*, 7 February 2011
"Can the Illinois Pension Catastrophe Be Stopped?" with Robert Novy-Marx, *Chicago Tribune*
"Pension Security Bonds: A New Plan to Address the Pension Crisis," with Robert Novy-Marx, *The Economists' Voice* 7(3), 2010
"A Bankruptcy to Save GM" with Luigi Zingales
Short version published in the *Chicago Tribune*, 23 November 2008
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"Bankruptcy is Best to Save GM," *The Economists' Voice* 6(4), 2009.

Other Publications

Rauh, Joshua, Public Comment on the Circular A-4 Revisions of April 2023, submitted to the U.S. Office of Management and Budget

Rauh, Joshua and Jillian Ludwig, 2023 "When are State Liabilities Federal Liabilities," in ed. Michael Boskin, *Federalism*, Stanford: Hoover Press.

Rauh, Joshua and Jillian Ludwig, 2023 "The California State Budget And Revenue Volatility: Fiscal Health In A Deficit Context," Hoover Institution Report.

Rauh, Joshua and Jillian Ludwig, 2022, "Homelessness in California: Practical Solutions for a Complex Problem," Hoover Institution Report.

Rauh, Joshua, Natalie Millar, and Gregory Kearney, 2021, "The Role of Alabama Universities in Fostering Innovation and Growth," Chapter 1, *Innovative Alabama – A Report by the Hoover Institution*

Rauh, Joshua, and Gregory Kearney, 2021, "Tax Policy, Subsidies, and Innovative Business Investment in Alabama: Past and Prospect" Chapter 4, *Innovative Alabama – A Report by the Hoover Institution*

Kearney, Gregory, and Joshua Rauh, 2021, "Taxation, Individual Actions, and Economic Prosperity: A Review," *Hoover Institution Human Prosperity Project*

Rauh, Joshua, 2020, "Transitioning from Defined Benefit to Defined Contribution Pensions in the Public Sector," in *Gathering Storm: The Risks of State Pension Underfunding*, Roger Porter and Tom Healey, eds, Cambridge University Press.

Rauh, Joshua, 2018, Testimony before the Joint Select Committee on the Solvency of Multiemployer Pension Plans, on www.pensions.senate.gov

Rauh, Joshua, 2017, "Hidden Debt, Hidden Deficits: 2017 Edition" Hoover Institution Essay.

Pozen, Robert, and Joshua Rauh, 2016, "A Tale of Six Cities: Underfunded Retiree Health Care," Hoover Institution Essay

Rauh, Joshua, 2016, "Hidden Debt, Hidden Deficits: How Pension Promises are Consuming State and Local Budgets," Hoover Institution Essay.

Evans, Scott, Teresa Ghilarducci, David Laibson, Olivia Mitchell, Alicia Munnell, Joshua Rauh, Susan Scheer, and Stephen Zeldes, 2016. "An Analysis of Options to Increase Retirement Security for New York City Private Sector Workers." Report commissioned by New York City Comptroller Scott M. Stringer.

Rauh, Joshua, 2016, "Why City Pension Problems Have Not Improved, and a Roadmap Forward," 2016, in *Public Pensions and City Solvency*, ed. Susan Wachter, Philadelphia: University of Pennsylvania Press.

Rauh, Joshua, 2015, "The Broad-Based Rise in the Returns to Top Talent," *Inequality and Economic Policy: Essays in Memory of Gary Becker*, Hoover Press.

Novy-Marx, Robert, and Joshua Rauh, 2011, "The Crisis in Local Government Pensions in the United States," in *Growing Old: Paying for Retirement and Institutional Money Management after the Financial Crisis*, Robert Litan and Richard Herring, eds., Brookings Institution, Washington DC.

Rauh, Joshua, 2011, "The Pension Bomb," *Milken Institute Review* 13(1), 26-37.

Rauh, Joshua, 2010, "Are State Public Pensions Sustainable? Why the Federal Government Should Worry About State Pension Liabilities" *National Tax Journal (Forum)* 63(10).

Rauh, Joshua, James Poterba, Steven Venti, and David Wise, 2009, "Lifecycle Asset Allocation Strategies and the Distribution of 401(k) Retirement Wealth," in *Developments in the Economics of Aging*, David A. Wise (ed), University of Chicago Press.

Rauh, Joshua and Irina Stefanescu, 2009, "Why are Firms in the United States Abandoning Defined Benefit Pension Plans?" *Rotman Journal of Pension Management* 2(2), 18-25.

Gruber, Jonathan, and Joshua Rauh "How Elastic is the Corporate Income Tax Base," in *Taxing Corporate Income in the 21st Century*, Cambridge University Press, Alan Auerbach, James R. Hines, and Joel Slemrod (eds.), 2007.

Rauh, Joshua, James Poterba, Steven Venti, and David Wise, 2005, "Utility Evaluation of Risk in Retirement Savings Accounts," in *Analyses in the Economics of Aging*, David A. Wise (ed), University of Chicago Press, 2005.

Older Working Papers

Rauh, Joshua, 2018, "Fiscal Implications of Pension Underfunding"

Rauh, Joshua, 2016, "Pension Promises and Solvency: The Effects of Low Interest Rates"

Rauh, Joshua, and Robert Novy-Marx, 2014, "Funding Soft Liabilities"

Rauh, Joshua, 2013, "The Causes and Consequences of the Rising Costs of Public Employee Pensions"

Novy-Marx, Robert, and Joshua Rauh, 2008, "The Intergenerational Transfer of Public Pension Promises," NBER Working Paper w14343

Rauh, Joshua, 2007, "The Effects of Financial Condition on Capital Investment and Financing: Evidence from Variation in Pension Fund Asset Performance"

Case Studies

Rauh, Joshua, 2015, "Discounting Liabilities: The Case of the Illinois Teachers Retirement System"

Amporful, Kwabena, Corinne Augustine, and Joshua Rauh, 2015, "Eden Tree: A Case Study," Stanford GSB Case Study IDE-10.
Morgan, Jessica, and Joshua Rauh, 2015, "Marin Software," Stanford GSB Case Study E-541
Morgan, Jessica, and Joshua Rauh, 2015, "Astro Gaming," Stanford GSB Case Study E-542
Luther, Jason, Jonathan Levav, and Joshua Rauh, 2014, "Eventbrite," Stanford GSB Case Study E-510

Opinions and Other Short Pieces – Internal Publications

"Why Did SVB Fail? We've Been Teaching About It for Years," with Jonathan Berk, in *Insights by Stanford Business,* April 2023.
"Private Investigations: Can Institutional Investors Fill the Infrastructure Gap?" with Aleksandar Andonov and Mels de Zeeuw, October 2021, SIEPR Policy Brief
"Pension Reform," 2018, in *Economic Policy Challenges Facing California's Next Governor*, Hoover Institution
"Can California Save Itself From A Pension Disaster?" *Eureka* 1801, January 2018
Reprinted as "California Saving" in *Hoover Digest* 2018(2), 132-136
"The Public Pension Crisis," *Defining Ideas*, Hoover Institution, 12 April 2016
"A Few Trillion Short," *Hoover Digest*, Hoover Institution, 27 January 2016
"Funding Retiree Healthcare Plans," with Robert Pozen, *Defining Ideas*, Hoover Institution, 19 August 2015
"Averting the Public Pension Crisis without a National Insurance Agency," *Advancing a Free Society*, Hoover Institution, 6 August 2013
"Public Sector Pensions Are a National Issue," *Advancing a Free Society*, Hoover Institution, 22 July 2013
"Real Pension Reform," *Advancing a Free Society*, Hoover Institution, 23 August 2012
"Termination vs Ongoing Approach for Pension Solvency Dates," *Everything Finance*, 23 March 2012
"Pensions in MuniLand," *Everything Finance*, 29 February 2012
"Government Unions and Public Sector Compensation," *Everything Finance*, 16 October 2011
"Shortfall for State and Local Pension Systems: Over $4 Trillion," *Everything Finance*, 6 October 2011
"Are State Pension Problems a 'Big Deal?'" *Everything Finance*, 2 September 2011
"Revenue Demands of Public Employee Pension Promises" *Everything Finance*, 21 June 2011
"Each Chicago Household In Fact Owes Over $80,000" *Everything Finance*, 21 June 2011
"Return Assumptions: It's All Just Borrowing In Disguise," *Everything Finance*, 20 September 2010
"Unfunded Pension Liabilities and GDP," *Everything Finance*, 25 February 2011
"Wipe Away Your Debts with State Government Accounting," *Everything Finance*, 1 November 2010
"Return Assumptions: It's All Just Borrowing In Disguise," *Everything Finance*, 20 September 2010
"Illinois' Irrelevant Pension Reform," *Everything Finance*, 15 April 2010
"The Day of Reckoning for State Pension Plans," *Everything Finance*, 22 March 2010

Podcasts

Let People Prosper Podcast, 2024, with Vance Ginn
Qualified Opinions: How Much Tax is Too Much Tax, 2024, with Veronique de Rugy
The Capitalism and Freedom in the 21st Century Podcast: Fiscal Policy, 2023, with Jon Hartley
Manhattan Insights: The Great Tax Migration, 2023, with Reihan Salam
EconTalk: Public Pensions, Library of Economics and Liberty, 2012, with Russ Roberts

Editorial Roles

Associate Editor, *Journal of Finance*, 2011-2019, 2020-present
Senior Editor, *Journal of Pension Economics and Finance*, 2021-present
Board of Editors, *American Economic Journal: Economic Policy*, 2016-2019
Editor, *Review of Corporate Finance Studies*, 2011-2013
Editor, *Journal of Pension Economics and Finance*, 2010-2016

Teaching Experience

MBA Stanford, ALP 307, Public Policy Lab: Financial Challenges Facing Cities (2023)

	Stanford, ALP 307, Public Policy Lab: Homelessness in California (2022)
	Stanford, GSBGEN 587, Policy Practicum: Alabama Innovation (2021)
	Stanford, FIN 207, Corporations, Finance, Governance in the Global Economy (2021)
	Stanford, FIN 201, Finance (2020)
	Stanford, FIN 207, Corporations, Finance, Governance in the Global Economy (2019)
	Stanford, FIN 207, Corporations, Finance, Governance in the Global Economy (2018)
	Stanford, FIN 205, Accelerated Managerial Finance Lab-Based Pilot (2017)
	Stanford, STRAMGT 315, Launch to Liquidity (2014-2016)
	Stanford, FIN 336, The Finance of Retirement and Pensions (Fall 2013, cross-listed)
	Kellogg, FINC 445 Private Equity and Venture Capital (Winter 2011, Spring 2012)
	Booth, Business 35200, Corporation Finance (2005-2009)
Undergraduate	Stanford, Econ 184, Institutional Investment Management (Fall 2017)
	Stanford, Econ 161, The Finance of Retirement and Pensions (Fall 2013, cross-listed)
	Harvard Summer, Econ S-1452, Money, Financial Institutions and Markets (2002-2003)
PhD	Stanford, FIN 633, Advanced Empirical Corporate Finance (2013, 2014, 2016, 2017)
	Kellogg FINC 520, Topics in Finance (Spring 2012)
	Booth, Business 35902, Theory of Financial Decisions II (Winter 2008, 2009)
	Booth, Business 35903, Theory of Financial Decisions III (Winter 2008, 2009)
Online	Stanford Mini Investments Course: Stocks and Bonds (Winter 2016)
	Stanford (on OpenEdX), Stocks and Bonds: Risks and Returns (Fall 2014)
	Stanford (on NovoEd), The Finance of Retirement and Pensions (Fall 2013)
Other	Stanford GSB ECFO Program (2022, 2023)
	Hoover Institution Summer Policy Boot Camp (Summer 2017-2023)
	Stanford GSB Exec Ed, Finance for Investment Professionals (Summer 2013-2023)
	Hoover Institution Congressional Fellowship Program (2018, 2019, 2022 (2x))
	LEC Workshop on the Economics of Pension Reform (Fall 2015, Winter 2016)
	Stanford GSB Exec Ed, Endeavor Innovation and Growth Program (Summer 2015-2016)
	Stanford GSB Exec Ed, Stanford Executive Program (Summer 2015)
	Stanford GSB Exec Ed, EPGC Program (Summer 2016-2018)
	UC Berkeley EMBA Program, Corporate Finance (Summer 2015-2017)
	Stanford SEED, Ghana, Finance Sessions (March 2014, December 2014, March 2015)
	Stanford SEED, Kenya, Finance Sessions (October 2016)
	Stanford GSB Exec Ed, Challenges Facing Family Firms (Fall 2018)
	Kellogg, Management for Scientists and Engineers, Finance Unit, (Summer 2010-2012)
	Kellogg, Various sessions on pensions (2011)
TA	MIT Sloan, 15.402, Corporate Finance II, Professor Kevin Rock

Other Research Experience

2002 – 2004	Research Assistant, Professor James Poterba
2001 – 2002	Research Assistant, Professor Jonathan Gruber

Non-Academic Experience

2021-2022	Analysis Group, Consulting Project
2014-2015	Brattle Group, Consulting Project
2012	Cornerstone Research, Consulting Project
1998 – 2000	Goldman Sachs International, London, UK
	Associate Economist (1999–2000), Research Assistant (1998–1999)
Summer 1997	Deutsche Bank, Frankfurt, Germany
	Research Intern (Corporate and Institutional Banking)

Summer 1996 Émigré Memorial German Internship Program, Bonn, Germany
Internship at the German *Bundestag*

Major Conference Presentations by Co-Authors of Co-Authored Papers

2023 NBER Corporate Finance Summer Institute [Andonov]
2022 ASU Finance Conference [Andonov]
Columbia Private Equity Conference [Andonov]
2020 Yale University Real and Private Value Assets Conference [Andonov]
2017 American Finance Association Meetings [Hochberg]
2016 NBER Entrepreneurship Fall Meetings [Andonov]
European Finance Association Meetings [Andonov]
UNC Private Equity Conference [Hochberg]
NBER Corporate Finance Fall Meetings [Hochberg]
2015 NBER Corporate Finance Fall Meetings [Giroud]
London Business School Causality Conference [Giroud]
2013 American Economics Association Meetings [Kaplan]
NBER Personal Retirement Challenges and Financial Solutions Conference [Novy-Marx]
2012 American Finance Association Meetings [Hochberg], Econometric Society Meetings [Hochberg]
2011 NBER Summer Corporate Finance Meetings [Hochberg]
2009 American Finance Association Meetings [Sufi], NBER Spring Corporate Finance Meetings [Sufi], Western Finance Association Meetings [Novy-Marx]
2004 European Finance Association [Bergstresser], NBER Spring Corporate Finance Meetings [Desai]
2008 American Finance Association Meetings [Kaplan]

Invited Discussions

2021 NBER Inequality, Discrimination, and the Financial System
2018 American Finance Association Meetings (Philadelphia)
2017 NBER Corporate Finance Summer Institute (Boston), NBER Corporate Finance Fall Meetings (Stanford)
2016 American Finance Association Meetings, Caltech/USC PE Conference, NBER Corporate Finance Spring Meeting (Chicago)
2015 American Economic Association Meetings
2014 Netspar Pension Conference (Venice)
2014 NBER Corporate Finance Spring Meeting (Chicago),
2014 Netspar Pension Conference (Amsterdam)
2013 Netspar Pension Conference (Frankfurt)
2012 American Economics Association Meetings, American Finance Association Meetings
2011 American Economics Association Meetings, American Finance Association Meetings
2010 NBER Entrepreneurship Meeting
2009 American Finance Association Meetings
2008 American Economics Association Meetings, American Finance Association Meetings
2007 NBER Behavioral Economics Working Group, Spring Meeting (Chicago)
Western Finance Association Meetings (Big Sky)
2006 Western Finance Association Meetings (Keystone)
Trans-Atlantic Public Economics Seminar / TAPES (Stockholm)
2005 American Finance Association Meetings (Philadelphia)
NBER Summer Institute Corporate Finance Meeting
Swedish Institute for Financial Research Conference on Corporate Governance
NBER Summer Institute Corporate Finance Meeting

Media Coverage

Select video and a complete list of my quotes or citations in the *Economist*, *Wall Street Journal*, *New York Times*, and *Financial Times* may be found at www.stanford.edu/~rauh/media.htm. My research has been covered extensively by global media outlets.

Service

2024	Associate Chair, Society of Financial Studies (SFS) Cavalcade North America
	Chair, Hoover Fellows Recruiting Committee, Hoover Institution
2023	Co-Organizer, NBER Business Taxation Meeting (October)
	Co-Organizer, Hoover Institution Summer Policy Boot Camp (August)
2022	Co-Organizer, NBER Business Taxation Meeting (October)
	Co-Organizer, Hoover Institution Summer Policy Boot Camp (August)
2021	Co-Organizer, NBER Fall Corporate Finance Meetings (November)
	Co-Organizer, NBER Conference on Taxation of Business Income (November)
	Co-Organizer, Hoover Institution Summer Policy Boot Camp (August)
2020	Co-Organizer, NBER Conference on Taxation of Business Income (October)
	Co-Organizer, Hoover Institution Summer Policy Boot Camp (Virtual - August)
2019	Chair, Search Committee for Hoover Institution Director (through October 2019)
	Co-Organizer, NBER Conference on Taxation of Business Income (October)
	Co-Organizer, Hoover Institution Summer Policy Boot Camp (August)
	Co-Organizer, Hoover Institution Infrastructure Conference (May)
2018	Co-Organizer, NBER Conference on Taxation of Business Income, PI on NBER funding from Smith-Richardson Foundation
	Co-Organizer, Hoover Institution Summer Policy Boot Camp
	Stanford GSB Advisory Board Presentation
	Session Moderator at SIEPR Forum "What's Next For California?"
2017	Co-Organizer, NBER Conference on State Business Taxation
	Co-Organizer, Hoover Institution Summer Policy Boot Camp (Inaugural Year)
	American Finance Association Nominating Committee
2016	Co-Organizer, NBER Universities Research Conference on State Business Taxation, PI on NBER funding from Smith-Richardson Foundation
2015-2016	Hoover Institution Master Plan Committee (Phase 2 – Renovation of LHH and HHMB)
2015-2016	New York City Retirement Security Study Group (Comptroller Scott M. Stringer)
2015	Reviewer of MIT-Sloan PhD Program
2015	Stanford Finance Group Recruiting Co-Coordinator
2015	Stanford Economics Department, Dissertation Defense Chair (Luke Stein, Stephen Sun)
2014	Stanford University Committee on Social Change at Scale
2013	Co-organizer, Hoover Institution's California Public Pension Solutions Conference
2013	Co-organizer, Fall NBER Corporate Finance Meetings at Stanford
2012-2015	Stanford GSB Dean's Advisory Group
2012-present	Stanford GSB Faculty Advisory Board
2012	Junior Recruiting Coordinator for the Kellogg Finance Department
2011	Junior Recruiting Coordinator for the Kellogg Finance Department
	Innovation Strategy Research Group at Kellogg School of Management
2010	Committee to Evaluate the Kellogg EMP Program
	Junior Recruiting Co-Coordinator for the Kellogg Finance Department